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# Effects of a needs-based education programme for family carers with a relative in an intensive care unit: A quasi-experimental study

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## Abstract

Critical illness and subsequent hospitalisation of a relative to an intensive care unit (ICU) can result in many physiological and psychosocial problems for patients and their family members. Caring for the anxiety and frustration of these families is an integral part of critical care nursing. The purpose of this study was to examine the effect of a needs-based education programme provided within the first 3 days of patients' hospitalisation, on the anxiety levels and satisfaction of psychosocial needs of their families. This was a quasi-experimental study with pre- and post-test design. A convenience sample was recruited over a period of three months, consisting of one primary family carer of each critically ill patient who had been admitted to an ICU in Hong Kong. Conducted by an ICU nurse specially assigned for the purpose, family carers in the experimental group ( $n = 34$ ) received an individual education programme based on the results of a literature review and an individual family needs assessment carried out at the time of patient admission, using the Critical Care Family Needs Inventory. The subjects in the control group ( $n = 32$ ) received the usual orientation and explanation given by the ICU nurses. Anxiety and need satisfaction were measured in the two groups at pre- and post-test and their mean scores were compared. Of the ten most important statements identified by the family carers in the two groups, the statements regarding the needs for information and assurance were found to predominate. After the needs-based intervention, the experimental group reported significantly lower levels of anxiety and higher levels of satisfaction of family needs than the control group at the post-test. The findings support the effectiveness of providing families of newly admitted critically ill patients, with a needs-based educational intervention to allay anxiety and satisfy immediate psychosocial needs. The formulation of a family education programme should be based on the results of a needs assessment, in order to meet family carers' individual needs.

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## 1. Introduction

With the rapid development of advanced technology, intensive care units (ICU) flourished in the 1960s as a site of care for critically ill patients. The ICU setting

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creates heavy demands on critical care nurses for monitoring the highly technical equipment and environment. Critical care nurses understand that severely ill patients' illness conditions may change and deteriorate at any time, and therefore they spend much time monitoring the patients' conditions. On the other hand, there is comparatively less time to care for patients' families or significant others (Gelling, 1999). Millar (1991) indicated that nurses often unintentionally neglect the feelings and needs of families accompanying critically ill relatives.

Nurses are well placed to provide psychosocial support and specific illness-related information to family members immediately following patients' admission into an ICU. Nursing interventions to these families over the first few days of hospitalisation can enhance understanding about each patient's condition and prognosis and provide informational and emotional support to help these families cope with any changes. The purpose of this study was to design, implement and evaluate an education programme based on a needs assessment of family carers of critically ill patients at an ICU in a general hospital in Hong Kong.

## 2. Background to the study

Critical illness often occurs without any warning, leaving little time for patients and their families to prepare (Leske, 1986). Sudden hospitalisation of a relative to an ICU or other critical care setting, as a consequence of acute or chronic illness, may result in emotional and psychosocial problems for their families. It is a catastrophic event for families and creates emotional upset, anxiety, uncertainty and fear of losing a loved one (Curry, 1995; Horn and Tesh, 2000). These families often undergo psychological crises, especially within the first few days of the patient's hospitalisation (Hudak and Gallo, 1994; Lee, 1998). Caring for the anxiety and concerns that families of critically ill patients face, is an integral part of psychosocial nursing. In order to allay the anxiety of families when patients are admitted to an ICU and prepare them for caring for their critically ill relatives, adequate and specific information that addresses families' immediate needs and concerns, should be given to them by critical care nurses, particularly during the first few days of patient hospitalisation (Read, 1998). Although the importance of family needs is fully recognised in critical care nursing practice, family education based on the results of a needs assessment has not, hitherto, been examined in research and clinical practice (Potinkara and Paunonen, 1996).

Wong (1995) indicated that the high levels of stress and anxiety experienced by families with a critically ill relative, often relate to the uncertain prognosis of the patient and lack of familiarity with and feelings of threat

about the ICU environment, with its high technology, complicated equipment, and other seriously ill patients. However, many researchers have shown that the specific needs and concerns of these families are not always met by health professionals (Kleinpell and Powers, 1992; Leung et al., 2000). The most cited reasons for needs not being met, relate to nurses' lack of understanding and consideration of the importance of these needs to the families (Millar, 1991).

A number of studies in the United States and Canada have investigated the immediate needs of culturally diverse family members of a relative with critical illness. Waters (1999) reported that White, non-Hispanic families emphasised their need for adequate information about patients' conditions in order to increase the family's sense of control over their life situation and to maintain their independence. Hispanic families ranked their need for comfort as important in maintaining family cohesiveness, whereas Black families wanted assurance and comfort from health professionals. Rukholm et al. (1991) compared the psychosocial needs between English and French-speaking families of critically ill patients in Ontario and emphasised that cultural influences affected family needs and anxiety during a critical illness.

In Hong Kong, the traditional Chinese culture believes the function of the family is to be emotionally and socially supportive to each family member (Yeh et al., 1994). Each family member, therefore, has a strong sense of filial responsibility to take care of other family members. Chinese family members, with Confucian principles such as a belief in being kind-hearted, giving respect and showing concern (Yeh et al., 1994), are interdependent and closely related to each other in daily life, especially for psychosocial support. Any changes within the family can easily disturb roles and relationships and create anxiety and stress for every family member. If one family member encounters a stressful event, other family members will share the burden and show a collective obligation toward coping with the event (Tseng et al., 1995). The hospitalisation of a Chinese relative in an ICU, therefore, results in both psychological and emotional disturbances for the whole family.

In caring for a critically ill relative, Chinese families often seek social support from other people, particularly their family members and health professionals. In two recent studies of family needs of critically ill patients, conducted in Hong Kong, the researchers found that Chinese families often expect to receive both timely and adequate information about a patient's progress and condition from doctors and nurses and professional advice on management of family crisis and participation in patient care (Lee, 1998; Wong, 1995).

If family members do not receive adequate information and psychological comfort, they may feel uncertain about the patients' conditions, treatment and care and

perceive that they have little control over this stressful event (Johnson et al., 1995). Families may also be easily confused by the medical language used by physicians and nurses when describing patients' conditions and treatment (Gaw-Ens, 1994). Failure of critical care nurses to interact appropriately with families of critically ill patients, or to identify or satisfy their needs, may lead to heightened anxiety, misunderstanding, and even hostility. This will enhance the families' mistrust of the critical care being provided by the nurses (Jamerson et al., 1996).

The need for an immediate assessment by critical care nurses, of the needs of families of patients with critical illness upon admission, has been well documented in studies since the 1970s (Leske, 1986; Wong, 1995). The Critical Care Family Needs Inventory (CCFNI) by Leske (1986) is a well established instrument for measuring these psychosocial needs and has been widely used in Western and Chinese samples (Leske, 1991; Leung et al., 2000). Many researchers have found that families' rating of their health needs are often different from that rated by nurses (Daley, 1984; Potinkara and Paunonen, 1996). Halm (1993) also indicated that nurses' intervention and education with regard to meeting family needs, is primarily formulated on untested assumptions regarding families' affective and behavioural responses and, thus, may result in ineffective or harmful outcomes. Therefore, the design of an education intervention for families in critical care should be based on the family's own perceptions of their educational needs and concerns, as suggested by critical care researchers in their recent studies (Horn and Tesh, 2000; Leung et al., 2000; Mendonca and Warren, 1998).

Health education and psychological support for families with a critically ill relative in an ICU, has also been highlighted in worldwide studies (Appleyard et al., 2000; Lee et al., 2000; Quinn et al., 1996). However, most studies in the past decade have focused on the description and assessment of family needs of critically ill patients during hospitalisation. Studies on interventions that address family needs in a critical care setting have been limited and the results were often inconclusive and unpromising (Harvey et al., 1995; Johnson and Frank, 1995; Potinkara and Paunonen, 1996; Wooley, 1990). Guidelines on the use of intervention protocols were inadequate, as was guidelines in the literature on health care and education for family carers of critically ill patients (Hudak and Gallo, 1994; Hupcey, 1999). Few studies have been undertaken on the use and effect of family education that uses information based on the results of a needs assessment provided by the critical care nurses, as a means of giving emotional support to such families (Wong, 1995).

Recent studies in critical care nursing indicate that nurses should adopt family-centred nursing practices, with a comprehensive and holistic approach to patient

care (Curry, 1995). Through an effective family education programme, nurses would be able to provide information and social support and act as the main source of psychological comfort for family members, and thus help them to become more relaxed in the stressful ICU environment (Hupcey, 1999). For this reason, the design, implementation and evaluation of a needs-based family education programme, provided by critical care nurses, would be important to family members during patients' hospitalisation in an ICU, for meeting their immediate psychosocial needs in such a stressful situation. With these questions and the knowledge gap in mind, this study was conducted to test the effectiveness of a needs-based education intervention for Chinese family carers of critically ill patients during the first few days of hospitalisation.

### 3. Methods

#### 3.1. Aims

The aim of this study was to examine the effect of a needs-based education programme for Hong Kong Chinese family carers of a relative with critical illness, during the first 3 days of patient's hospitalisation in an ICU. Targeted outcomes were the family carers' levels of anxiety and their satisfaction of needs. Two research hypotheses were tested:

- (1) There would be significant reduction of anxiety in family carers who received a needs-based education programme provided within the first 3 days of patients' hospitalisation by one ICU nurse specially assigned for the purpose, when compared with the control group who received routine informational and psychological support given by ICU nurses.
- (2) There would be a significant increase in needs satisfaction in family carers who received the needs-based education programme, when compared with the control (routine care) group.

#### 3.2. Design

This was a quasi-experimental study with two non-randomised study groups, using a pre- and post-test design. The strength of quasi-experimental studies lies in their practicality and feasibility in clinical areas (Polit and Hungler, 1999). This study was conducted at a 20-bed ICU of a regional general hospital in the New Territories, a major geographical region of Hong Kong. During the 3-month data collection period, the critically ill patients recruited in this study had a variety of

medical diagnoses, mainly consisting of respiratory failure, congestive heart failure, cardiac arrest, renal failure, and septicemia. The occupancy rate of the unit was usually between 90% and 100%, and nurse-patient ratios were 1:1 during daytime, and 1:2 or 1:3 during the night shift. Similar to the current practice of other ICUs in Hong Kong after the outbreak of Severe Acute Respiratory Syndrome (SARS), the ICU only allowed two family members to visit the patient each day. The visiting hours were from 12:00 to 13:30 and from 18:00 to 20:00. There was not any guideline or education programme specially designed for encouraging family participation in taking care of patients with critical illness in Hong Kong.

Because this study was conducted in one single ICU, it was only feasible to use a convenience sampling method, in order to recruit sufficient number of family carers to the experimental and control groups at the same period of time. The subjects were recruited from two clusters (i.e. two sides) of the ICU: one family carer of each patient, with bed number 1–10 at one side of the ICU, was assigned to the experimental group; and one carer of the patient, with bed number 11–20 at another side of the unit, was assigned to the control group. This sampling method could minimise treatment contamination. Family carers in the two study groups might be aware of receiving an educational intervention in a different form, however they were asked not to share information with other family carers in the ICU. The ICU staff were informed of the purpose and procedure of the study and the assignment of subjects in the two study groups, and they had a chance to ask questions about the study.

### 3.3. Participants

A convenience sample of 66 family carers was recruited over a period of three months, consisting of one primary family carer of each critically ill patient who had been admitted to the 20 bed ICU. Thirty-four family carers of the patients who were assigned with bed number 1–10 in the ICU were designated as the experimental group, while 32 family carers of the patients with bed number 11–20 were assigned to the control group. Power calculations, based on two previous studies of educational intervention for families of patients with critical illness (Appleyard et al., 2000; Johnson and Frank, 1995), indicate that a sample of 64 subjects (i.e. 32 family carers in each group) is required, both before and after intervention, in order to detect a significant difference in anxiety reduction of large effect size between the treatment and control groups, at the 5% significance level, with a power of 80% (Cohen, 1988), and to take account of an average attrition rate of 10%.

One of the family members, who visited the critically ill relative on the day of admission and met the study criteria, was invited to be the subject in this study. The inclusion criteria of the subjects were: (a) the spouse or blood-related family member of the critically ill patient; (b) aged 18 or above; (c) able to read and understand Chinese; and (d) identified self as the primary family carer of the patient. However, the primary family carer was excluded if he/she: (a) was caring for another physically or mentally ill relative; (b) was physically and/or mentally impaired; or (c) had previously had a relative admitted to an ICU.

### 3.4. Data collection

A structured questionnaire consisting of two research instruments in Chinese was used for pre- and post-test measures. These two instruments included.

#### 3.4.1. The Chinese version of the State-Trait Anxiety Inventory (C-STAI)

Anxiety levels of family members were measured using the C-STAI developed by Spielberger et al. (1970) and translated and validated by Tsoi et al. (1986). The C-STAI consists of two self-report scales designed to measure a transitory emotional state (A-State) and a relatively stable disposition of anxiety (A-Trait). For the A-State scale, subjects indicate how they feel at that moment on a 4-point Likert scale of increasing intensity from 1 = not at all to 4 = very much so. The A-Trait scale asks subjects to indicate how they generally feel, also on a 4-point Likert scale from 1 = almost never to 4 = almost always. Possible range of scores for each scale is from 20 (i.e., not anxious) to 80 (i.e., extremely high anxiety). Internal consistencies for the C-STAI are 0.90 and 0.81 for the A-State and A-Trait scales, respectively (Shek, 1988). The C-STAI also significantly correlates with other theoretical relevant measures of psychological well-being (Shek, 1993). The Cronbach's alpha coefficients in this study were 0.88 for A-State Scale and 0.83 for A-Trait scale.

#### 3.4.2. The Chinese version of the Critical Care Family Need Inventory (C-CCFNI)

The C-CCFNI is a Chinese version of the Critical Care Family Need Inventory developed by Leske (1986) and translated by Lee (1998). This instrument is a self-report scale designed to measure the relative importance of 45 needs of family members with a relative admitted in an ICU. The need statements are rated on two 4-point Likert scales. Subjects indicate their perceived importance of each need statement from 1 = not important to 4 = very important. Subjects also indicate their level of need satisfaction from 1 = never satisfied to 4 = almost always satisfied. Exploratory factor analysis by Leske (1991) indicated that it consists of five distinct domains



of needs: information (8 items), assurance (7 items), support (15 items), comfort (6 items), and proximity (9 items). Satisfactory content validity and internal consistency reliability were reported (Leung et al., 2000). Cronbach's alpha coefficients were: 0.84 for overall scale and 0.65–0.82 for five domains. In this study, the alpha coefficients were 0.83 for overall scale and ranged 0.76–0.85 for five domains.

#### 3.4.3. Demographic data sheet

All subjects were also asked to complete a demographic data sheet attached with the pre-test questionnaire. The data sheet included family carer's age, gender, education level, relationship to patient, living arrangement with patient, and patient's age. Patients' diagnoses were examined from their case records in the ICU.

#### 3.5. Needs-based intervention

During the second (Day 2) and third (Day 3) day of the patient's hospitalisation, each family carer in the experimental group received two consecutive 1 h education sessions, one on each day. A critical care nurse who was specially assigned to provide care for the patient conducted these two education sessions. The content of the education programme was formulated based on the results of an individual family needs assessment undertaken at the pre-test, using the C-CCFNI, and the findings of several family needs studies of critically ill patients in Hong Kong Chinese population (Lee, 1998; Leung et al., 2000; Wong, 1995). Each family carer's rating of the 45 need statements during the pre-test determined his/her priority of needs for education. The need statements perceived as important (i.e. with importance rated 3 or 4) and not satisfied (i.e. satisfaction rated 1 or 2) for each family carer in the experimental group, were listed in descending importance, grouped into themes and categories, and addressed in the two education sessions by the assigned ICU nurse. Those important needs identified at the pre-test by the family carers in the experimental group mainly included: the need for information such as what and why specific treatment and care is/was done and what they can do at the bedside for the patient; the need for assurance such as understanding the specific facts about the illness and the patient's expected outcome; and the need for support such as talking about the patient's death and negative feelings (e.g. guilt and anger).

Some essential information about the ICU setting and practice was provided in common during the first session of the education programme, such as the ICU environment and facilities, visiting hours, daily unit routine, and names, types and contact information of staff members taking care of the patient.

This needs-based education programme in the ICU differed from the routine informational and psychological

support by the ICU nurses in three aspects. First, the content of the orientation was driven by the findings of both group and individual needs assessment rather than by the critical care experiences of the ICU nurses. Second, it was provided by one assigned ICU nurse instead of a group of ICU nurses in an ad hoc basis. Lastly, a three-page pocket-sized pamphlet listing out the key information about the ICU facilities was given to the family carers for reference during the first session. At the end of each session, time was allowed to answer the carers' questions.

This needs-based education programme also emphasised on nurse-initiated interactions with the family carer, and the critically ill patient who was conscious and mentally competent for receiving information. To increase consistency and continuity of nurse-family interactions, one ICU nurse who was specially assigned to care for the patient and his/her family conducted the orientation of the ICU and the two education sessions. To ensure family centred care, each family carer was approached by the assigned nurse during visiting time and was encouraged to talk about his/her concerns and express his/her emotions towards the patient's hospitalisation. Between Day 1 and Day 3, the assigned nurse undertook a daily follow-up telephone contact with the family carers to settle their concerns about any changes in the patient's condition and to answer any questions raised from the education sessions. Brykczynska (1995) suggested that these initiatives in interactions with patients and their family carers represent a collection of positive person-centred values. The assigned ICU nurse accommodated these values during and after the education programme. The consistent and continuous interactions would also be useful to establish a positive trust relationship between nurse and family carer of the patient under his/her care (Morse, 1991).

#### 3.6. Study procedure

Upon patient admission, the researchers invited one family carer of each patient, who met the study criteria to participate in the study, when they visited their critically ill relative. Written consent was obtained from each family carer. The family carers, whose critically ill relative was with bed number 1–10, were assigned as the experimental group, and those carers of the patients with bed number 11–20 were assigned as the control group.

On the day of ICU admission (Day 1), the subjects in both the experimental and control groups were asked to complete a pre-test questionnaire, consisting of the C-CCFNI, the C-STAI and a demographic data sheet. After the pre-test, each family carer in the control group received the routine orientation and explanation by the ICU nurses during the first (Day 1) to third (Day 3) day of the patients' hospitalisation. It consisted of an introduction to the ICU environment and facilities, daily routine and visiting hours, and a brief explanation

of the patient's current condition and treatment plan. On the fourth day (Day 4) of the patients' hospitalisation, the family carers in the control group completed a post-test questionnaire when they visited the patient, consisting of the A-state scale and the C-CCFNI Satisfaction scale.

After completion of the pre-test questionnaire, each family carer in the experimental group received two education sessions, which were conducted by the assigned ICU nurse in an interview room on Day 2 and Day 3, at a time of their convenience. The content of the sessions was formulated based on the results of the needs assessment at the pre-test, using the C-CCFNI. The other nurses in the ICU were informed of the family carers' participation in the study and agreed to withhold the routine orientation of the ICU and information about the patients' conditions given to the carers in the experimental group. However, the medical treatment and nursing care provided for the carers by the ICU nurses and other staff, as usual. Similar to the control group, the family carers in the experimental group also completed the post-test questionnaire on Day 4.

The reasons for carrying out the post-test of the anxiety levels and satisfaction of the family needs on Day 4, in examining the effect of the needs-based intervention to family members, were in two-folds. First, most of the psychosocial needs expressed by the families of the patients with critical illness were found to be predominant within the first two to three days of the patients' hospitalisation, and these needs should be identified and intervened by critical care nurses, within such critical period (Curry, 1995; Johnson et al., 1995; Lee et al., 2000). Second, the physical condition of the critically ill patients may change or improve after the first few days of their hospitalisation and, thus, they either are transferred to a medical unit for further treatment and rehabilitation, are prepared for discharge, or suddenly die and may induce shock and distress to their family members.

### 3.7. Ethical considerations

Ethical approvals were obtained from the Clinical Research Ethics Committee of the Chinese University of Hong Kong and the hospital under study. The Hospital Chief Executive of the study hospital also granted the access to the study site. When visiting the patient, one family carer of each critically ill patient was invited to participate voluntarily in this study by one of the researchers. Written consent was sought from individual family carers for study participation, with a full explanation of the purpose and procedures of the study. Each family carer was also assured that a decision of non-participation or withdrawal from the study would not affect the quality of patient care.

### 3.8. Data analysis

The statistical programme for qualitative data analysis, SPSS for Windows version 11.0, was used to analyse the questionnaire data. Descriptive and inferential statistics were used to summarise the demographic characteristics and the pre- and post-test data, and a comparison of the demographic characteristics and the pre-test data was made between the experimental and control groups.  $\chi^2$  test was used to compare the demographic variables between the two groups to check their comparability (Polit and Hungler, 1999). An alpha level of 0.05 was used. The pre-test mean scores of the C-STAI and C-CCFNI, importance and satisfaction scales, were also compared between the two groups to assess for significant differences on these pre-test data between the two groups, using unpaired *t*-tests (two-tailed).

For testing the research hypotheses, a one-way analysis of the covariance (ANCOVA) test was conducted, in order to compare the post-test anxiety and need satisfaction scores between the experimental and control groups, using the C-CCFNI, A-Trait and A-State pre-test scores as the co-variants. A covariate analysis was appropriate: (1) to eliminate systematic error outside the control of the researcher due to the non-random sampling method, and (2) to account for differences in the outcome data due to unique characteristics of the subjects (Hair et al., 1995). The level of significance of the *t* and ANCOVA tests was set as 0.01, using the Bonferroni's correction to protect against a Type I error across the multiple tests (Portney and Watkins, 2000).

## 4. Results

### 4.1. Sample characteristics

A total of 66 subjects participated in the study, with 34 families in the experimental group and 32 in the control group. There was not any subject withdrawn or dropped out from the study. The mean ages of the subjects were 37.8 years ( $SD = 7.75$ ) and 35.9 years ( $SD = 6.98$ ) in the experimental and comparison group, respectively. Their relations with the patient in the two groups mainly included parents, spouses, and child. More than one-half of them lived with the patient prior to hospitalisation. About three-quarters of the subjects in both the experimental (79.5%) and control (75%) groups had received secondary school or tertiary level of education. The demographic characteristics of the two groups and the results of the  $\chi^2$  tests are summarised in Table 1. There were no statistical differences in the demographic characteristics between the two groups ( $p > 0.05$ ).

Table 1  
Demographic characteristics of family members in two groups

	Experimental ( <i>n</i> = 34) Frequency (%)	Control ( <i>n</i> = 32) Frequency (%)	$\chi^2$	<i>p</i>
Gender			0.05	0.82
Male	18 (52.9)	17 (53.1)		
Female	16 (47.1)	15 (46.9)		
Age range			0.03	0.86
18–29	8 (23.5)	7 (21.9)		
30–39	18 (52.9)	16 (50.0)		
40–49	4 (11.8)	5 (15.6)		
50–59	4 (11.8)	4 (12.5)		
Education level			0.16	0.17
Primary school or below	6 (17.7)	8 (25.0)		
Secondary school	21 (61.8)	16 (50.0)		
Tertiary <sup>a</sup>	7 (20.5)	8 (25.0)		
Relationship with patient			0.04	0.84
Parent	11 (32.4)	10 (31.2)		
Spouse	9 (26.5)	9 (28.1)		
Child	6 (17.5)	7 (21.9)		
Sibling & others (e.g. grandchild)	8 (23.6)	6 (18.8)		
Living arrangement with patient			0.04	0.85
No	12 (35.3)	13 (40.6)		
Yes	22 (64.7)	19 (59.4)		

<sup>a</sup>Tertiary education refers to the study in university, polytechnic and graduate school.

In comparing the pre-test scores between the experimental and control groups, the A-Trait score [ $t(64) = 1.69, p = 0.11, 95\% \text{ CI} = 1.45\text{--}1.87$ ], A-State [ $t(64) = 1.91, p = 0.08, 95\% \text{ CI} = 1.72\text{--}2.10$ ], C-CCFNI importance scale total scores [ $t(64) = 1.14, p = 0.25, 95\% \text{ CI} = 0.92\text{--}1.29$ ], and satisfaction total scores [ $t(64) = 1.08, p = 0.21, 95\% \text{ CI} = 0.90\text{--}1.19$ ] did not differ significantly between the two groups.

The mean ages of the patients were 43.1 years (SD = 9.3, range = 32–78 years) and 48.2 years (SD = 12.5, range = 34–80 years) in the experimental group and the control group, respectively. Medical diagnoses of the patients in the two groups mainly included: cardiovascular diseases (41% for the experimental group and 46% for the control group), respiratory diseases (34% for the experimental group and 33% for the control group), and renal diseases (17% for the experimental group and 13% for the control group). In summary, there were no statistical differences in the patients' characteristics between the two groups, using  $\chi^2$  test ( $p > 0.05$ ).

#### 4.2. The top ten important need statements

A total of 10 need statements in the C-CCFNI were rated to be important or very important (i.e., rating of 3 or 4) by 20 of the 34 families (58.8%) in the experimental

group, with a mean score of 3.0 or above. The mean satisfaction scores of these need statements by the experimental group were low at the pre-test, ranging from 1.15 to 1.95. The mean scores and standard deviations of these ten most important needs, in descending order, are listed in Table 2. Of these 10 important needs, five were needs for information, such as "To know exactly what is being done for the patient"; three of them were needs for assurance, such as "To know specific facts concerning the patient's progress"; and two of them were needs for support, such as "To talk about negative feelings such as guilt or anger". Mean ratings of importance of these need statements are also shown in Table 2. With unpaired *t*-test, there was not any significant difference in the mean scores of the ratings of importance of the need statements between the experimental and control groups found at the pre-test ( $p > 0.05$ ).

#### 4.3. Comparison of A-state and need satisfaction scores between groups

The mean scores and standard deviations of the A-State scale and the C-CCFNI satisfaction scale and its subscale, and the results of the one-way ANCOVA are presented in Table 3. Preliminary checks were conducted to ensure that there was no violation of the assumptions



Table 2  
Ten top important needs rated by family carers in two groups at baseline measure

Need statement <sup>a</sup>	Experimental ( <i>n</i> = 34)		Control ( <i>n</i> = 32)		<i>p</i> <sup>*</sup>	95% CI
	M	SD	M	SD		
To know specific facts concerning the patient's progress (1) <sup>b,c</sup>	3.38	0.52	3.46	0.42	0.57	0.09–0.12
To know the expected outcome (2) <sup>c</sup>	3.29	0.48	3.33	0.30	0.69	0.02–0.10
To talk about negative feelings such as guilt or anger (6) <sup>d</sup>	3.23	0.32	3.15	0.29	0.29	0.05–0.11
To know exactly what is being done for the patient (3) <sup>c</sup>	3.18	0.58	3.26	0.60	0.58	0.04–0.13
To have directions as to what to do at the bedside (15) <sup>e</sup>	3.15	0.50	3.06	0.81	0.59	0.06–0.20
To know how the patient is being treated medically (4) <sup>e</sup>	3.12	0.42	3.20	0.71	0.58	0.02–0.18
To know about the types of staff members taking care of the patient (19) <sup>e</sup>	3.10	0.68	3.02	0.53	0.60	0.04–0.15
To have explanations of the environment before going into the ICU for the first time (5) <sup>c</sup>	3.07	0.51	3.19	0.80	0.47	0.06–0.20
To know why specific things were done for the patient (21) <sup>e</sup>	3.04	0.71	2.96	0.58	0.62	0.04–0.14
To talk about the possibility of the patient's death (10) <sup>d</sup>	3.02	0.55	3.08	0.91	0.75	0.03–0.12

Note: Mean scores are based on a 1- to 4-point importance scale with 4 being the highest score. 95%CI—95% confidence interval for the difference in mean scores between groups.

<sup>\*</sup>The level of significance in comparing item mean scores between groups using independent *t*-test.

<sup>a</sup>Need statements of the Chinese version of the Critical Care Family Needs Inventory are listed in order of descending mean scores for family members in experimental group.

<sup>b</sup>Ratings of item importance by the comparison group in parentheses.

<sup>c</sup>Items belong to assurance scale.

<sup>d</sup>Items belong to support scale.

<sup>e</sup>Items belong to information scale.

Table 3  
Comparison of A-State and C-CCFNI satisfaction mean scores between two groups

	Experimental group ( <i>n</i> = 34)				Control group ( <i>n</i> = 32)				<i>F</i> (1, 62)*	<i>p</i> -value
	Pre-test		Post-test		Pre-test		Post-test			
	M	SD	M	SD	M	SD	M	SD		
A-State scale	57.81	9.25	39.93	7.23	58.23	7.85	48.81	6.53	5.63	0.006
C-CCFNI	126.80	13.54	145.58	15.91	124.88	11.47	132.05	13.55	5.61	0.006
(satisfaction scores)										
Support	42.23	6.05	48.04	8.91	42.47	5.89	43.82	7.05	7.02	0.002
Comfort	15.84	6.15	19.21	7.03	15.30	5.26	16.95	5.33	5.41	0.007
Information	24.12	7.96	28.97	7.13	23.48	7.01	23.89	6.78	7.41	0.002
Proximity	24.35	6.56	26.52	6.34	24.31	6.22	25.54	6.09	3.81	0.04
Assurance	20.46	6.78	23.99	5.53	20.41	6.89	21.79	5.77	5.49	0.006

Note: C-CCFNI—the Chinese version of the Critical Care Family Need Inventory, A-State Scale—the Chinese version of the State Anxiety Scale.

\**F*-values of the between-group comparison of the post-test mean scores for each variable, using ANCOVA test.

of normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of the covariates (pre-test C-STAI and C-CCFNI scores). After adjusting for the A-State, A-Trait and C-CCFNI pre-test scores, there were significant differences between the experimental and control groups in the post-test scores of the A-State scale and the C-CCFNI. When compared with the control group, the family carers in the experimental group had a significant reduction in their levels of anxiety,  $F(1, 62) = 5.63$ ,  $p = 0.006$ , with a large effect size (i.e.  $\eta^2 = 0.18$ ), according to Cohen (1988). The experimental group also indicated a significant increase in the level of satisfaction of family needs,  $F(1, 62) = 5.61$ ,  $p = 0.006$ , with a large effect size (i.e.  $\eta^2 = 0.21$ ).

As indicated in Table 3, there were significant differences on most of the C-CCFNI subscale scores between the experimental and control groups ( $p < 0.01$ ), except the needs for proximity ( $p = 0.04$ ). These statistically significant results indicate that the family carers in the experimental group undertook the needs-based education programme were more satisfied with their psychosocial needs and indicated lower level of anxiety, when compared with the control group. Therefore, the two research hypotheses were supported.

## 5. Discussion

The ratings of the 45 need statements in the C-CCFNI illustrated the relative importance of the family needs and their levels of satisfaction. Of the 10 most important needs identified by the families in the experimental and control groups, the statements relating to the needs for

information and assurance about the patients' conditions, were found to be predominant. They have also been highlighted as the most important needs in previous studies of family needs in different critical care settings, and in culturally diverse groups (Kleinpell and Powers, 1992; Lee, 1998; Quinn et al., 1996; Rukholm et al., 1991). However, the ratings on the needs for information and assurance (Mean scores = 2.96–3.46) by the Chinese family carers in this study were relatively higher than those of previous Western studies, whose mean scores were between 2.8 and 3.3 (Quinn et al., 1996; Rukholm et al., 1991). This finding may reflect the fact that Chinese families are more eager to have specific information concerning the patient's progress and treatment and to have specific directions or instructions when it comes to caring for the patient at his/her bedside. These most important needs expressed by the family carers, match the assumption of a high level of inter-dependence, filial responsibility and obligation for caring for each family member within Chinese culture. Negative feelings such as guilt and anger also prevailed among the Chinese family carers, reflecting their strong sense of responsibility concerning the health condition of their critically ill relative. Therefore, it is important for nurses to provide psychological and informational support to Chinese families at the earliest opportunity after the patient's admission to an ICU, in order to reduce their high level of anxiety and strong feelings of responsibility for the patient's critical illness and hospitalisation.

It is also interesting to note that, in contrast to normal Chinese religious beliefs (Meredith et al., 1994), the Chinese families in this study were willing, not only to express their need to talk openly about the possibility of

the patient's death (i.e. the tenth important need in the experimental and control groups) but also to face the impending death of the critically ill relative. Family education about the patient's condition, combined with receiving care and reassurance about how the best treatment and care is being given to the patient by health professionals, should be emphasised in critical care nursing. Critical care nursing literature (Ruppert et al., 1996) has shown that this is an effective means of reducing family members' anxiety and frustration concerning the hospitalisation of their critically ill relative.

In this study, the Chinese families also showed strong family kinship and belief in family obligation, caring roles and the inter-dependent nature of family relationships. When the critically ill relative was admitted to the ICU, most of the family members visited the patient at the earliest moment, and one of them would stay with the patient overnight. When approached by the assigned ICU nurses, most of them were very eager to understand more about the patient's condition and to participate in this study. The mean ratings of most of the 45 need statements in the C-CCFNI and the mean state anxiety score were higher than those reported in previous Western studies (Jamerson et al., 1996; Kosco and Warren, 2000; Mendonca and Warren, 1998; Rukholm et al., 1991). These findings support the idea that Chinese families value harmony, mutual obligation, and family solidarity and place more emphasis on interdependence than on independence (Leung et al., 2000), than in Western culture. Family members often seek to maintain the equilibrium and function of the family structure by supporting each other throughout any critical period. Mutual helping behaviour and participation in caring for the family member who has been sick, are frequently reported among the Chinese as indications of family solidarity (Yeh et al., 1994).

The effect sizes on A-State and needs satisfaction between the experimental and control groups in this study were large (i.e.,  $\eta^2$  greater than 0.14; Cohen, 1988). In other words, the post-intervention anxiety and need satisfaction scores in the experimental group were substantially different from those of the control group. The level of statistical significance achieved in the testing suggests that there was less than a 5% chance of committing a Type II error and, thus, little chance of falsely accepting the null hypotheses. The two research hypotheses of this study were therefore supported. The findings support the importance of providing family members of a relative admitted to an ICU with well-structured and appropriate education, based on the results of a needs assessment, so as to reduce their high anxiety and help satisfy their immediate psychosocial needs. The necessity for an individual needs assessment of family carers of patients with critical illness upon admission and the systematic planning of an education

programme during the first few days of hospitalisation, based on the assessment results, should be undertaken in order to achieve a high quality of family oriented care.

Such an educational intervention would enable family carers to obtain better understanding of the patient's condition and the ICU environment, and so gain more control over patient care during the first few days of hospitalisation. A significant correlation between patient information, emotional support and need satisfaction has been documented in previous studies (Meredith et al., 1994; Quinn et al., 1996). Indeed, Jamerson et al. (1996) and Leung et al. (2000) suggested that family needs in critical care settings appear to be focused on the care of the critically ill patient and on being with the patient, rather than focusing on their own feelings and comfort. When the need for information and assurance about the patients' condition and the need for appropriate care are met, family members' anxiety and concerns for their critically ill relatives in an ICU are shown to diminish. It is important to note that the education intervention that is designed to meet the most important information and assurance needs of the families, can also enhance satisfaction with other psychosocial needs, listed in the C-CCFNI, including the need for support and comfort.

Moreover, the needs-based education intervention may also serve the purpose of supporting families in coping with their psychosocial needs. Kleinpell and Powers (1992) stated that support needs of family members of patients with critical illness are related to the availability of social support for their emotional and social problems. The assigned ICU nurses in this study acted as active listeners to the family carers' emotional reactions, concerns and uncertainty about the patients' condition and provided appropriate psychological support and full explanations to the questions and concerns of the carers in the experimental group. This respect and social support by the nurses and other health professionals, has been shown to be an essential component of intervention for patients and families during the crises in their lives, such as when the patient's condition suddenly worsens in the ICU (Geary et al., 1994).

## 6. Study limitations

Several limitations in this study are worth noting. The small sample size and non-probability sampling in a single ICU might limit its generalisation to different critical care settings. With non-random sampling in this study, other confounding factors such as the information and emotional support provided for the families by the staff in the ICU were not controlled, and these might have also contributed to the significant effect of the educational intervention. A convenience sample was used in this study and, therefore, the experimental and

control groups might not be equivalent. Although the differences between the family members' socio-demographic characteristics in the two groups were accounted for, any systematic or unmeasured differences within the sample, such as the differences in the severity of the patients' illness and differences in the families' social support from other family members, were not tested.

In this study, it is difficult to attribute the effectiveness of the education intervention on anxiety reduction and increased need satisfaction for the family carers in the experimental group, to the specific information provided or to the format or manner of its provision. The experimental group received an education intervention that differed from the one received by the control group in three ways: (1) the information was given by one assigned ICU nurse only; (2) the content of the education they received was based on the results of a needs assessment; and (3) the nurses in the ICU were asked to withhold any routine orientation from the family carers. Any of these three distinct differences or components might have been responsible for the reported significant differences on anxiety levels and needs satisfaction between the two groups and further study is warranted on the effect of each component to these family carers.

The research team did not examine systematically the families' knowledge and understanding of the information presented. Such an evaluation might contribute to better understanding of the effectiveness and appropriateness of the needs-based intervention.

## 7. Implications and conclusions

In this study, the needs-based educational intervention was shown to be effective in improving the psychological state and in satisfying the immediate needs of families of a relative newly admitted into an ICU. This educational intervention provided by the assigned ICU nurses, based on the results of an individual needs assessment, has potential to be adopted by nurses in different critical care settings, as well as in culturally diverse populations. The findings of this study warrant further empirical investigation of this needs-based family education programme in critical care settings, particularly with families from different socio-economic and cultural backgrounds in Chinese and Western populations. Through such intervention, critical care nurses can provide a high quality family centred practice. However, other important elements within the education programme in terms of its structure and content may also have resulted in reported improvements in the family carers' psychosocial conditions in this study. Therefore, these elements should be examined individually, before the improved anxiety and needs

satisfaction scores can be clearly and appropriately attributed to the intervention.

As this study only tested the immediate impact of a needs-based education intervention on the psychosocial needs of family members of critically ill patients, during the first few days of hospitalisation, an evaluation of the long-term effects should be considered, in order to satisfy family needs during the whole period of hospitalisation. Further study could also be conducted to examine and compare the effectiveness of different approaches to a needs-based educational intervention, on meeting the immediate and long-term family needs in different critical care settings.

## References

- Appleyard, M.E., Gavaghan, S.R., Gonzalez, C., Ananian, L., Tyrell, R., Carroll, D.L., 2000. Nurse-coached intervention for the families of patients in critical care unit. *Critical Care Nurse* 20, 40–48.
- Brykczynska, G., 1995. Humanism: a weak link in nursing theory? In: Schober, J.E., Hinchliff, S.M. (Eds.), *Towards Advanced Nursing Practice*. Edward Arnold, London, pp. 68–80.
- Cohen, J., 1988. *Statistical Power Analysis for the Behavioural Sciences*, second ed. Erlbaum, New Jersey.
- Curry, S., 1995. Identifying family needs and stresses in the intensive care unit. *British Journal of Nursing* 4, 15–19.
- Daley, L., 1984. The perceived immediate needs of families with relatives in the intensive care setting. *Heart & Lung: The Journal of Acute & Critical Care* 13, 231–237.
- Gaw-Ens, B., 1994. Informational support for families immediately after CABG surgery. *Critical Care Nurse* 14, 41–42 47–50.
- Geary, P.A., Formella, L.A., Tringali, R., 1994. Significance of the insignificant. *Critical Care Nurse Quarterly* 17, 51–59.
- Gelling, L., 1999. The role of hope for relatives of critically ill patients: a review of the literature. *Nursing Standard* 14, 33–38.
- Hair, J.F., Anderson, R.E., Tatham, R.L., Black, W.C., 1995. *Multivariate Data Analysis*, fourth ed. Prentice-Hall, New Jersey.
- Halm, M.A., 1993. Behavioral responses of family members during critical illness. *Clinical Nursing Research* 2 (4), 414–437.
- Harvey, C., Dixon, M., Padberg, N., 1995. Support group for families of trauma patients: a unique approach. *Critical Care Nurse* 15 (4), 59–63.
- Horn, E.V., Tesh, A., 2000. The effect of critical care hospitalization on family members: stress and responses. *Dimensions of Critical Care Nursing* 19, 40–49.
- Hudak, C.M., Gallo, B.M., 1994. *Critical Care Nursing: A Holistic Approach*. Lippincott, Philadelphia.
- Hupcey, J., 1999. Looking out for the patient and ourselves: the process of family integration into the ICU. *Journal of Clinical Nursing* 8, 252–262.
- Jamerson, P.A., Scheibmeir, M., Bott, M.J., Crighton, F., Hinton, R.H., Cobb, A.K., 1996. The experiences of

- families with a relative in the intensive care unit. *Heart & Lung: The Journal of Acute & Critical Care* 25, 467–474.
- Johnson, M.J., Frank, D.I., 1995. Effectiveness of a telephone intervention in reducing anxiety of families of patients in an intensive care unit. *Applied Nursing Research* 8, 42–43.
- Johnson, S.K., Craft, M., Titler, M., Halm, M., Kleiber, C., Montgomery, L.A., Megivern, K., Nicholson, A., Buckwalter, K., 1995. Perceived changes in adult family members' roles and responsibilities during critical illness. *Image: The Journal of Nursing Scholarship* 27, 238–243.
- Kleinpell, R.M., Powers, M.J., 1992. Needs of family members of intensive care unit patients. *Applied Nursing Research* 5, 2–8.
- Kosco, M., Warren, N.A., 2000. Critical care nurses' perceptions of family needs as met. *Critical Care Nursing Quarterly* 23, 60–72.
- Lee, I.Y.M., 1998. Needs of families who have a relative in a critical care unit in Hong Kong. Unpublished master's thesis, Department of Nursing, The Chinese University of Hong Kong, Hong Kong SAR, China.
- Lee, I.Y.M., Chien, W.T., Mackenzie, A.E., 2000. Needs of families with a relative in a critical care unit in Hong Kong. *Journal of Clinical Nursing* 9 (1), 46–54.
- Leske, J.S., 1986. Needs of relatives of critically ill patients. *Heart & Lung: The Journal of Acute & Critical Care* 15, 189–193.
- Leske, J.S., 1991. Internal psychometric properties of the Critical Care Family Inventory Needs. *Heart & Lung: The Journal of Acute & Critical Care* 20, 236–244.
- Leung, K.K., Chien, W.T., Mackenzie, A.E., 2000. Needs of Chinese families of critically ill patients. *Western Journal of Nursing Research* 22, 826–840.
- Mendonca, D., Warren, N.A., 1998. Perceived and unmet needs of critical care family members. *Critical Care Nursing Quarterly* 21, 58–68.
- Meredith, W.H., Abbott, D.A., Zheng, F.M., 1994. Healthy family functioning in Chinese cultures: an exploratory study using the Circumplex Model. *International Journal of Sociology of the Family* 24, 147–157.
- Millar, J.F., 1991. Hope-inspiring strategies of the critically ill. *Applied Nursing Research* 2 (1), 23–29.
- Morse, J.M., 1991. Negotiating commitment and involvement in the nurse–patient relationship. *Journal of Advanced Nursing* 16, 455–468.
- Polit, D.F., Hungler, B.P., 1999. *Nursing Research: Principles and Methods*, sixth ed. Lippincott, Philadelphia.
- Portney, L.G., Watkins, M.P., 2000. *Foundation of Clinical Research: Application to Practice*, second ed. Prentice-Hall, New Jersey.
- Potinkara, H., Paunonen, M., 1996. Alleviating anxiety in nursing patient's significant others. *Intensive and Critical Care Nursing* 12, 327–334.
- Quinn, S., Redmond, K., Begley, C., 1996. The needs of relatives visiting adult critical care units as perceived by relatives and nurses. *Intensive and Critical Care Nursing* 12, 168–172.
- Read, C., 1998. Patients' information needs in intensive care and surgical wards. *Nursing Standard* 12, 37–39.
- Rukholm, E.E., Bailey, P.H., Coutu-Wakulczyk, G., 1991. Family needs and anxiety in ICU: cultural differences in Northeastern Ontario. *Canadian Journal of Nursing Research* 23 (3), 67–81.
- Ruppert, S.D., Kernicki, J.G., Dolan, J.T., 1996. *Dolan's Critical Care Nursing: Clinical Management Through the Nursing Process*, second ed. F.A. Davis, Philadelphia.
- Shek, D.T.L., 1988. Reliability and factorial structure of the Chinese version of the Stat-Trait Anxiety Inventory. *Journal of Psychopathology and Behavioral Assessment* 10, 303–317.
- Shek, D.T.L., 1993. The Chinese version of the Stat-Trait Anxiety Inventory: its relationship to different measures of psychological well being. *Journal of Clinical Psychology* 49, 349–358.
- Spielberger, C.D., Gorsuch, R.C., Lushene, R.E., 1970. *Manual for the State-Trait Anxiety Inventory*. Consulting Psychologists Press, California.
- Tseng, W.S., Lin, T.Y., Yeh, E.K., 1995. Chinese societies and mental health. In: Lin, T.Y., Tseng, W.H., Yeh, E.K. (Eds.), *Chinese Societies and Mental Health*. Oxford University Press, Hong Kong, pp. 3–18.
- Tsoi, M.M., Ho, E., Mak, K.C., 1986. Becoming pregnant again after birth or the birth of a handicapped child. In: Dennerstein, L., Fraser, I. (Eds.), *Hormones and Behaviour*. Elsevier Science, Holland, pp. 68–90.
- Waters, C.M., 1999. Professional nursing support for culturally diverse family members of critically ill adults. *Research in Nursing and Health* 22, 107–117.
- Wong, F., 1995. The needs of families of critically ill patients in a Chinese community. *The Hong Kong Nursing Journal* 69, 25–29.
- Wooley, N., 1990. Crisis theory: a paradigm of effective intervention with families of critically ill people. *Journal of Advanced Nursing* 15, 1402–1408.
- Yeh, M.L., Gift, A.G., Soeken, K.L., 1994. Coping in spouses of patients with acute myocardial infarction in Taiwan. *Heart & Lung: The Journal of Acute & Critical Care* 23 (2), 106–111.