Reducing family members' anxiety and uncertainty in illness around transfer from intensive care: an intervention study

Marion L. Mitchell, , a and Mary Courtney, b, c

a School of Nursing, Griffith University, Australia
b School of Nursing, Queensland University of Technology, Australia
c Royal Brisbane Hospital Health Service District, Australia

This is the author's version of this work. Please cite as
Intensive and Critical Care Nursing
Volume 20, Issue 4 , August 2004, Pages 223-231

Abstract
Introduction: This intervention study examines anxiety and uncertainty in illness in families transferring from intensive care to a general ward. Methods: The pre-test, post-test design purposively allocated family members to a control (n = 80) and intervention group (n = 82). The intervention group experienced a structured individualised transfer method whereas the control group received existing ad hoc transfer methods. Families were surveyed before and after transfer. Results: Families' uncertainty was significantly related to their state anxiety (P < 0.000), the relationship to the patient (P = 0.022), and the unexpected nature of patients' admission (P < 0.000). Anxiety increased significantly with reduced social support (P = 0.002). Following transfer, anxiety reduced significantly for both groups whereas uncertainty reduced significantly for the intervention group (P = 0.03). Conclusion: Families at the time of transfer experience uncertainty and anxiety, which are significantly related in this study. The intervention significantly reduced uncertainty scores. When the family member was a parent, when admissions were unexpected, and those with fewer social supports represent potential 'at risk' groups whose adaptation to transfer may limit their coping ability. The structured individualised method of transfer is recommended with further research of ICU families to further examine the dimension of uncertainty and how it affects patient outcomes.

Author Keywords: Intensive care; Family; Education; Transfer; Uncertainty in illness; Anxiety; Admission; Family relationship; Social support

Introduction

This paper reports on an intervention study designed to reduce anxiety and uncertainty in illness in family members around the time of transfer from an intensive care unit (ICU). It is part of a larger study evaluating the intervention from both the family and nurse perspective and for this paper; results from family members will be reported. The term 'family member' in this study is broadly defined and includes patients' non-related significant others.

Transfer from the close monitoring and generally, one on one nursing in ICU to an open ward environment is reported as a stressor for family members (Leith, 1999).

Anxiety of family members around the time of transfer has been demonstrated to reduce their ability to play a key role in patients' recovery (Leske, 1992; McShane, 1991 and Spatt et al., 1986). This anxiety can be understood as a consequence of the enormity of the change.

Feelings of uncertainty about the illness may also impair family members' adaptation, leading to the perception that the transfer is appraised as a negative experience, thus limiting the coping strategies on the part of family members (Mishel, 1988). The relationship between uncertainty and anxiety of family members has not been a focus of research within ICU and yet literature suggests that high levels of uncertainty and anxiety individually impair adaptation and coping strategies for those experiencing it (Wong and Bramwell, 1992).

Literature review

A person's admission to ICU is frequently sudden and unexpected, often leading to emotionally charged situations and life changing circumstances for family members and patients. Supporting these families presents immense challenges for ICU nurses. Without effective family coping strategies and problem solving, a family is unable to function adequately (Friedemann, 1993) and attain a state of equilibrium.

Mishel has extensively explored the concept of uncertainty in illness since the early 1980s. She defines it as "… the inability to determine the meaning of illness related events. It is the cognitive state created when the person cannot adequately structure or categorise an event because of the lack of sufficient cues" (Mishel, 1988, p. 225). Experiencing uncertainty restricts one's ability to decipher and interpret a situation (Mishel, 1981) that may impair adaptation leading to the perception that the illness event, in this case transfers from ICU, is viewed as a negative experience. The family's adaptation and coping strategies may prove to be inadequate in managing the transfer and illness situation, which continues beyond the critical care environment.

Mishel and others have added to the knowledge of uncertainty in illness in a wide range of illness situations. The primary aims of these studies have been to further explore the phenomenon of uncertainty and to define component of the theory rather than to design and evaluate interventions to reduce it. For example, Mishel (1983) examined uncertainty in a cohort of parents of hospitalised children; other researchers examined uncertainty with gynaecological patients (Mishel and Braden, 1987 and Mishel and Sorenson, 1991); and those with breast tumours (Deane and Degner, 1998; Mast, 1995 and Wong and Bramwell, 1992). Uncertainty has also been explored in chronic illnesses such as rheumatoid arthritis (Braden, 1990) and cystic fibrosis (Yarcheski, 1988).

Mishel's theory contends that consistent information and education from a credible authority reduces uncertainty by assisting one to understand treatment situations (Mishel and Braden, 1988). It has been found that social support assists with decreasing ambiguity related to mixed messages about the state of the illness and so adjust to the situation (Mishel and Braden, 1987). Wineman et al. (1996) also found a relationship between the level of one's education and uncertainty, and those with more education having lower uncertainty levels. An adaptation of Mishel's original tool for family members, the Parent's Perception of Uncertainty in Illness—Family

(PPUS-FM) has been used to determine spouses' uncertainty compared with their ill partners (Northouse et al., 1995).

Only one intervention study was found (Andersson-Segesten, 1991) where two models of nursing care (primary nursing and team nursing) were used to compare uncertainty levels in coronary care patients. A non-significant result in this study could be attributed to a misconception of the theoretical underpinnings that focus on reliable, consistent information being given to participants. It is suggested that both styles of nursing have the capacity to deliver this to patients and hence the non-significant difference in uncertainty levels. The well-developed theory and paucity of intervention studies highlights the need for further research on ways uncertainty can be reduced. Anxiety, however, is a well-understood feature of critical illness situations. Recently it has been linked, or associated with uncertainty in illness (Wong and Bramwell, 1992).

Spielberger (1983) contends that one facet of anxiety—state anxiety, relates to an individual's reaction to a particular situation, which alters as the situation and their methods of managing it alters (Chavez and Faber, 1987). Raised levels of anxiety inhibit families' capacity to influence patient recovery and add to patient care (Lynn-McHale and Smith, 1993), thus affecting patient outcomes. Anxiety generated behaviours such as hypervigilance (Leske, 1991) and repeated questioning of staff (Broome, 1985), together with an inability to understand the significance of events (Benner et al., 1999), compound to impair decision making by families (Halm et al., 1993). The relationship between uncertainty in illness and anxiety for family members at the time of transfer from ICU is currently not understood.

The aim of this study is to describe and compare the uncertainty and anxiety levels of family members being transferred from ICU with either existing ad hoc transfer methods or a structured method of transfer. The following research questions were formulated:

Question 1 What is the level of uncertainty in illness in family members before transfer from ICU?
Question 2 Is there a relationship between family members' uncertainty in illness and state anxiety levels, and what patient and family member' characteristics are significantly related to these factors?
Question 3 Has the introduction of the pre-transfer educational intervention led to a reduction in uncertainty in illness or state anxiety levels?

Method

Design and sample

The study setting was a 24-bed metropolitan tertiary referral hospital in Australia. On average, the ICU admits around 1500 patients annually. Patients commonly require mechanical ventilation and or, intensive monitoring following elective and non-elective procedures for a wide variety of conditions including cardiac, neurological, vascular and trauma.

The research aims are addressed by using a pre-test, post-test control group design. The sample size for the study was set at 80 participants for both the control and intervention groups in response to power analysis. A convenience sampling technique

was used to recruit families between January and June, 2002. The inclusion criteria are:

(1) Patient is in ICU more than 10 hours;
(2) Family member is over the age of 18 years;
(3) Family member is able to understand and write English; and
(4) Patient transfer is not for palliative care.
(4). Instruments

(1) Mishel's PPUS-FM has been developed to measure the level of uncertainty in family members whose relative is ill. The scale has 31 items rated on a four-point Likert scale. The score is calculated by summing respondent's scores with higher scores indicate higher levels of uncertainty. Possible scores range from 31 to 155. Validity and reliability for the PPUS-FM version has been tested and found to have a standardised Cronbach's alpha coefficient of 0.91 (Mishel, 1983).
(2) Spielberger's (1983) state anxiety inventory (SAI) consists of a 20 item self-reporting questionnaire which evaluates how respondents feel 'at this moment', and is rated on a four-point Likert scale. Tallies are calculated by adding the scores for each item and the higher the score the higher the state anxiety. The standardised Chronbach's alpha coefficient for the SAI in normative samples is 0.92 (Spielberger, 1983) with the test–retest correlations ranging from 0.16 to 0.62. These relatively low correlations are expected, as state anxiety measures should be able to detect situational differences with respect to anxiety (Spielberger, 1983). The SAI has been used extensively in the area of intensive care and has been successful in measuring state anxiety levels (Bouve et al., 1999; Lynn-McHale et al., 1997; Poe, 1982 and Rukholm et al., 1991).
(3) The Rand and Medical Outcomes Study, Social Support Scale (MOS SSS) comprises 19 items in a self-administered, multidimensional survey that measures social functioning as a measure of social support (Sherbourne and Stewart, 1991). Scoring is unidirectional with a five-point answer scale with a total score ranging from 19 to 95. Higher scores indicate more support. As both tangible and emotional support is thought to assist people in coping with stress and illness (McDowell and Newell, 1996 and Mishel and Braden, 1987), it is an important variable to examine with this cohort.
(4) Demographic questions are included in the surveys in response to findings in the literature that suggest they may influence anxiety or uncertainty and included family member's age, gender, relationship to the patient, years of education, and previous visits or admissions to ICU. Additional patient data collected included age, nature of admission, reason for admission, gender, length of stay (LOS) in ICU, and Acute Physiology Age Chronic Health Evaluation Scale (APACHE III) score. The purpose of calculating the APACHE III score is to accurately predict the hospital mortality risk for critically ill patients within 78 major medical and surgical risk categories (Cooper et al., 1999). The APACHE III (range 0–299) attributes scores to the patient's age, severity and type of disease, and co-morbidities (Knaus et al., 1991) with higher numbers indicating a higher risk of mortality. This measure is calculated daily as opposed to the APACHE II score which is only measured on admission. Knaus et al. (1991, p. 1627) found the new APCHE III score was a more accurate predictor than the APACHE II that underestimated "the impact of physiological abnormalities on hospital mortality". The APACHE III score is a well-recognised and reliable tool for measuring the degree of illness of ICU patients (Cooper et al., 1999)

and is routinely recorded daily in the site ICU and available to the researcher. The maximum APACHE III score can be used in statistical analysis to more clearly represent the severity of illness during the patient's stay in ICU and the way this may contribute to family members' anxiety and uncertainty.

(4). Intervention

The intervention for this study consists of a written brochure individualised by the bed-side nurse to prepare families for imminent patient transfer from ICU. The nurses were educated about the methods to employ to ensure consistency. By engaging with family members, nurses could measure their readiness to learn about patient problems and in some cases, defer discussion or speak in added depth to fulfil family members' needs. The brochure was designed to be individualised for each family and has spaces for the patient's name to be entered along with the projected time of transfer, ward, doctor and clinical nurse specialist's name in the new ward. The brochure contains sentences that act as prompts for nurses and covers five areas. The five areas include: transfer plans, ward information, staff information, expectations in the general ward, and support services for family members.

By way of example, the first section (planning for transfer) has as one of its prompts "Do you know the plan of care for …?" Depending on the answer to this, the nurse would inform the family member of relevant information based upon the family member's current knowledge and understanding and include the plan and timing for patient transfer. Proposed treatment can be discussed under this topic and expected length of stay. This area of discussion is at times extensive and may involve other health care team members such as an intensivist or social worker. Additional information about the brochure content and the manner in which it was developed is being prepared for publication and limitations on word length restrict the authors giving more detail here.

Procedure

Ethical approval was received from the research site and the Queensland University of Technology, Human Research Ethics Committees. No identifying information was placed on the questionnaires which were number coded to ensure confidentiality. All data is stored according to guidelines by National Health and Medical Research Council.

All data collection tools were piloted on a similar sample of 10 participants to ensure questions and instructions were clear. No changes were required following the pilot period and thus the data from the pilot were included in analyses.

The researcher ascertained which patients were for transfer to a general ward. When a family member visited, the researcher approached them after obtaining access permission from the bed-side nurse. Only one, self-selected family member per patient was recruited into the study to prevent the potential for skewing the results based on a few patients with many family members. Consenting participants were asked to complete the first of the self-administered questionnaire. The second questionnaire was completed within 24 h following transfer to the general ward.

The first sample of family members constituted the control group. The intervention was then introduced into ICU over a two-week period. During this period, ICU nurses were recruited and written consent obtained. Through in-service education and one-

on-one sessions, the researcher explained in detail the structured, individualised method to the nurses to ensure consistency and understanding. Adequate preparation for nurses in the discharge process from ICU is recognised as essential (Chaboyer et al., 2002). Data collection commenced the next day in the same manner with the intervention group who all experienced the structured method of transfer by their bed-side nurse. The ICU nurse population was relatively stable during data collection.

Data analysis

The data were entered into the Statistical Package for Social Sciences (SPSS—Version 10.0, 1999) for the descriptive and inferential statistical analyses of the returned questionnaires. Descriptive statistics were used to examine demographic variables. Continuous variables were described with means and standard deviation, or median scores for each cohort. Categorical or dichotomous variables were described with frequencies and percentages. Specific statistical tests will be outlined in the results section. Level of significance was set at $P < 0.05$.

Results

The researcher recruited 177 family members over a 24-week period. Of these, 162 completed the two questionnaires (n = 162), a response rate of 91%. There were 80 participants in the control group and 82 in the intervention group.

Demographic characteristics of sample

A summary of patient demographic and clinical characteristics is shown in Table 1 and family member characteristics and clinical features are displayed in Table 2. The categorical or dichotomous data were analysed using Chi square analysis. Two sample t-tests were performed on the interval and ratio data to compare means of the control and intervention groups. The degree of illness (APACHE III) was the only patient or family member characteristic which was significantly different when the control and intervention groups were compared ($Z = -2.05$, $P = 0.04$).

Question 1 What is the level of uncertainty in illness in family members before transfer from ICU?

The family members' mean level of uncertainty for the control group was 77.22 (S.D. = 15.31, range 36–107) and the intervention group 78.93 (S.D. = 11.51, range 44–107). Homogeneity of variance was broken in the between-group comparison so a Mann–Whitney analysis was employed. There was no statistical difference in the control and intervention groups' PPUS-FM ($Z = -.41$, $P = 0.68$).

Question 2 Is there a relationship between family members' uncertainty in illness and state anxiety levels, and what patient and family member' characteristics are significantly related to these factors?

Table 1. Summary of demographic and clinical characteristics of patients.

Characteristic	Control ($n = 80$)				Intervention ($n = 82$)			
	f	%	Mean (S.D.)/median	Range	*f*	%	Mean (S.D.)/median	Range
Age in years			58.8 (17.3)	17–86			56.3 (16.1)	15–92
Gender								
Female	21	26.3			26	31.7		
Male	59	73.7			56	68.3		
APACHE III			55.0	20–143			47.0	21–116
LOS in days			0.97	0.5–38.0			0.96	0.42–34.8
Admission								
Expected	56	70.0			52	63.4		
Unexpected	24	30.0			30	36.6		

Table 2. Summary of demographic and clinical characteristics of family members.

Characteristic	Control ($n = 80$)				Intervention ($n = 82$)			
	f	%	Mean (S.D.)/median	Range	*f*	%	Mean (S.D.)/median	Range
Age in years			49.9 (12.0)	25–79			48.6 (14.1)	18–80
Gender								
Female	55	68.8			59	72.0		
Male	25	31.2			23	28.0		
Relationship to patient								
Partner/spouse	34	42.5			40	48.8		
Child	27	33.8			22	26.8		
Parent	11	13.8			8	9.8		
Brother/sister	4	5.0			8	9.8		
Other	4	5.0			4	4.9		
Years of education			11.2 (3.1)	5–21			11.2 (2.7)	6–20
Previous ICU experience								
Yes	48	60.0			47	57.3		
No	32	40.0			35	42.7		
Social support			83.5	46–95			81.0	29–95

Pearson product–moment correlations were performed using PPUS-FM scores before transfer and continuous variables (age, APACHE III, education level, LOS, social support, SAI). State anxiety scores before transfer were significantly related to PPUS-FM before transfer ($r = 0.49$, $R2 = 0.243$, $P < 0.000$) and accounted for 24.3% of the variance of uncertainty in illness scores.

One-way analysis of variance (ANOVA) was used to test for the difference in uncertainty scores for the categorical variables (gender, relationship with patient, previous ICU experience, nature of admission). The relationship of the family member to the patient was significantly related to differences in uncertainty scores ($P = 0.022$, $2 = 0.07$). Post hoc analysis of mean uncertainty scores for the relationship groups was performed to analyse group interaction using a Tukey test. The only significant difference occurred between the parent group and the child group ($P = 0.015$) (Table 3).

Table 3. Relationship groups' PPUS-FM scores.

Group	Mean	S.D.
Parent	85.63	11.28
Other	83.00	13.63
Sibling	80.33	9.25
Partner	77.73	12.45
Child	74.25	11.28

Nature of admission was also significantly related to uncertainty scores. Those participants who were unexpectedly admitted to ICU scored significantly higher uncertainty scores than those who knew in advance they were to be admitted to ICU (expected admissions mean PPUS-FM = 74.7 [S.D. = 13.2], unexpected admissions mean SCORES = 84.8 [S.D. = 11.4]). One-way analysis of variance with uncertainty and the nature of admission, indicated that there was a significant difference between expected and unexpected admissions' uncertainty scores ($P < 0.000$, 2 = 0.13).

To examine how much of the variance of uncertainty scores was accounted for by the three significant variables together (nature of admission, relationship with patient and state anxiety before transfer), they were entered in one step into a multiple regression with uncertainty in illness the criterion variable (Table 4). As the relationship with the patient variable contained more than two categories, dummy coding, which involved the creation of a series of dichotomous dummy variables that contrast members in one category with all others, was performed. Together the variables accounted for 33% of the uncertainty in illness scores (adjusted R2 = 0.330).

Table 4. Multiple regression of PPUS-FM and selected factors.

Factor	*B*	Beta (β)	*T*	*P*
Relationship				
Spouse	−2.83	−0.105	−0.684	0.495
Sibling	0.37	0.007	0.072	0.943
Child	−6.02	−0.204	−1.418	0.158
Parent	−0.92	−0.022	−0.191	0.849
Expected/unexpected	8.57	0.300	4.582	0.000**
STAI	0.463	0.456	6.959	0.000**

State anxiety scores were examined using similar analyses for the continuous and categorical variables as performed for uncertainty in illness. Social support experienced by the family (r [1/160] = −0.243, R2 = 0.059, P = 0.002) and uncertainty in illness (already found to be significant) were significantly related to state anxiety. As social support increased, the state anxiety scores decreased. Social support and uncertainty in illness were entered in one step into a multiple regression with state anxiety the criterion variable. Together they accounted for 30.2% of variance of state anxiety.

Question 3 Has the introduction of the intervention led to a reduction in uncertainty in illness or state anxiety?
The uncertainty in illness mean scores before and after transfer for the control and intervention groups were examined using paired t-test analysis. The intervention group had a significant reduction in their uncertainty in illness (P = 0.029) (Table 5). The state anxiety mean scores before and after transfer for the control and intervention groups using paired t-test analyses showed both groups had significantly reduced scores following transfer (Table 6).

Table 5. PPUS-FM before and after transfer.

Group	PPUS-FM before transfer		PPUS-FM after transfer		*T* (DF)	*P* (two-tailed)
	Mean	S.D.	Mean	S.D.		
Control	77.22	15.31	76.24	17.64	0.80 (79)	0.424
Intervention	78.93	11.51	76.38	15.99	2.21 (80)	0.029[*]

Table 6. State anxiety before and after transfer.

Group	SAI before transfer		SAI after transfer		*T* (DF)	*P* (two-tailed)
	Mean	S.D.	Mean	S.D.		
Control	41.24	13.21	37.11	13.45	3.60 (79)	0.000[**]
Intervention	41.62	13.42	37.72	13.92	2.81 (81)	0.006[*]

Discussion and nursing implications
The aim of this study is to describe and compare the uncertainty and anxiety levels of family members being transferred from ICU with existing ad hoc transfer methods and a structured method of transfer. The level of uncertainty in illness has not previously been described in family members in an ICU environment. In this study, the mean levels of uncertainty in illness ranged from 77.22 (control group) to 78.93 (intervention group) before transfer which is a similar score to the raw data reported by Mishel (1997) in a sample of family members of mixed ICU patients (mean = 78.6, S.D. = 10.4). Without additional information, comparisons cannot be made between the current study and the data from the mixed ICU sample, however, the current study confirms the notion that uncertainty exists for family members at the time of patient transfer from ICU.

Anxiety, the unexpected nature of an ICU admission, and when the family member is a parent as opposed to a child of the patient, had a significant effect on the level of uncertainty in illness. The impact of an unexpected admission to ICU on increasing one's uncertainty about the illness situation is predictable and supports the conceptualisation of uncertainty, which reasons that unfamiliarity with an event, and more specifically, lack of knowledge and understanding, increases uncertainty (Mishel and Braden, 1988). The emergency admission left no time for families to adjust to a situation that demands significant role changes (Leske, 1992) and mental

adjustment (Keogh, 2001). Results of this study demonstrate higher levels of uncertainty continue for unexpected admissions into the transfer period.

The relationship of the participant to the patient is a less easily explained factor that was significantly related to uncertainty scores in the current study. When the participant was a parent as opposed to the daughter or son of patients, their level of uncertainty was significantly higher. It appears that participants had particular difficulty as they grappled with the situation of a critical illness in their progeny. Other studies have not reported how the relationship to the patient affects uncertainty levels. The current study's results, however, indicate this data is worthy of collection and that special consideration should be given to parents of patients in ICU at the time of transfer.

The third factor significantly affecting uncertainty was family members' anxiety that accounted for one quarter of the variability seen in uncertainty levels. This supports the findings of Wong and Bramwell (1992) who reported a significant relationship between uncertainty and anxiety following transfer for women following a mastectomy.

These results suggest that critical care nurses need an understanding of uncertainty in illness as it potentially affects family members' ability to adjust to the situation of patient transfer (Mishel, 1997). Mishel (1997) postulates that uncertainty in illness reduces the decision-making capacity as a result of an inability to interpret and subsequently evaluate the illness. A communication intervention, such as in the current study, which provided details of what to expect following patient transfer is suggested as a way to help families accurately interpret the positive aspect of transfer and in so doing reduce their uncertainty.

Although state anxiety reduced significantly after transfer, it remained 6.9 points higher than normative data for working adults and just below the classification of 'medium anxiety' which has scores of 40–59 (Spielberger, 1983). Similar results of state anxiety have been reported in other studies of family members in ICU (Bokinskie, 1992; Chartier and Coutu-Wakulczyk, 1989; Lynn-McHale et al., 1997 and Rukholm et al., 1991) and emphasises the need for ICU registered nurses to be knowledgeable about how family members' anxiety affects interaction with staff and their decision-making ability, even around the time of patient transfer. Although research data on the anxiety levels of family members at transfer have been available for a decade, few specific interventions have been implemented to counter the adverse effects of this (Ward et al., 1990). The recognition of the importance of continuity of patient care beyond the boundaries of ICU is integral to ICU nurses embracing the implementation of interventions directed to the transfer period.

Two factors were significantly related to anxiety, one was the level of uncertainty in illness (already discussed), and the other the level of social support experienced by families where a negative correlation ($R = -0.243$; $P = 0.002$) was recorded. That is, as social support increased, state anxiety scores decreased significantly. It needs to be noted, however, that social support, although statistically significant, is responsible for only 5.9% of the variance of anxiety. Receiving assistance from others is thought to be a primary way to manage critical illness situations as it provides an effective method for coping (Sherbourne and Stewart, 1991). The benefit of supportive families

was also reported in qualitative studies (Chen, 1990 and Coulter, 1989) that described family members' need to discuss their concerns with others as a means of coping with the situation. Therefore, these studies and the current study suggest that those family members with limited social support systems are a potential 'at risk' group for higher anxiety levels.

The structured intervention did not significantly contribute to a reduction in anxiety following transfer in the current study. Uncertainty levels, however, for the intervention group showed a significant reduction not seen in the control group who remained uncertain. As this study is the first of its kind examining uncertainty where an intervention has reduced uncertainty, it is not possible to draw on other research. It is nevertheless encouraging that uncertainty levels reduced significantly for those experiencing the intervention and therefore warrants further investigation.

Limitations

The pre-test, post-test study design threatened the internal validity of the study (Beanland et al., 1999). The sample included mainly female family members and results may only be representative of that population. Although the sample size was adequate for this particular study, all participants were drawn from one site and therefore restricts the generalisability of results. Finally there was no previous published study available for direct comparison in the area of PPUS-FM in the ICU environment hence more research is needed.

Recommendations for future nursing practice and research

In the main, previous research in the area of uncertainty in illness has been based upon diagnostic categories rather than on the physical location of participants. It may be that the intense nature of an ICU environment has its own impact upon anxiety and uncertainty in illness irrespective of the admitting condition for the patient. It is suggested therefore, that further research with this cohort is necessary before any defining conclusions can be made. The incorporation of research with families within speciality ICUs, such as Paediatric Intensive Care Units (PICUs) would provide further information on the significance of parental uncertainty signalled in this study as a potential 'at risk' group.

Conclusions

This study has evaluated an individualised, structured transfer method and examined uncertainty in illness and anxiety in ICU families. It reports a direct relationship with family members' uncertainty and state anxiety where uncertainty accounted for 26.4% of variance of state anxiety. Patient's unexpected admission to ICU and when the family member was the parent as opposed to the son or daughter, saw a significant increase in the level of uncertainty in illness in participants. Social support, however, had a positive effect on reducing anxiety. Results show that those family members who experienced a structured individualised transfer scored significantly reduced uncertainty levels following transfer and therefore this method of transfer is recommended for future ICU transfers. Further research with ICU family members in both adult and PICU is recommended to further examine the dimension of uncertainty and how it impacts upon patient outcomes.

Acknowledgements

The researcher would like to acknowledge the Royal College of Nursing, Australia and the Centaur Memorial Fund for Nurses for their support of this study.

References

Andersson-Segesten, K., 1991. Patients' experience of uncertainty in illness in two intensive coronary care units. Scand. J. Caring Sci. 5 1, pp. 43–47.

Beanland C, Schneider Z, LoBiondo-Wood G, Haber J. Nursing research methods. Critical appraisal and utilisation. Sydney: Mosby; 1999.

Benner P, Hooper-Kyriakidis P, Stannard D. Clinical wisdom and interventions in critical care: thinking-in-action approach. Philadelphia:W.B. Saunders Company; 1999.

Bokinskie, J.C., 1992. Family conferences: a method to diminish transfer anxiety. J. Neurosci. Nurs. 2 3, pp. 129–133.

Bouvé, L.R., Rozmus, C.L. and Giordano, P., 1999. Preparing parents for their child's transfer from the PICU to the pediatric floor. Appl. Nurs. Res. 12 3, pp. 114–120.

Braden, C.J., 1990. A test of the self-help model: learned response to chronic illness experience. Nurs. Res. 39 1, pp. 42–47.

Broome, M., 1985. Working with the family of a critically ill child. Heart Lung 14 4, pp. 368–372.

Chaboyer, W., Foster, M., Kendall, E. and James, H., 2002. ICU nurses' perceptions of discharge planning: a preliminary study. Intensive Crit. Care Nurs. 18 2, pp. 90–95.

Chartier, L. and Coutu-Wakulczyk, G., 1989. Families in ICU: their needs and anxiety level. Intensive Care Nurs. 5, pp. 11–18.

Chavez, C.W. and Faber, L., 1987. Effect of an education-orientation program on family members who visit their significant other in the intensive care unit. Heart Lung 16 1, pp. 92–99.

Chen, Y., 1990. Psychological and social support systems in intensive and critical care. Intensive Care Nurs. 6, pp. 59–66.

Cooper, G.S., Sirio, C.A., Rotondi, A.J., Shepardson, L.B. and Rosenthal, G.E., 1999. Are readmissions to the intensive care unit a useful measure of hospital performance?. Med. Care 37 4, pp. 399–408.

Coulter, M.A., 1989. The needs of family members of patients in intensive care units. Intensive Care Nurs. 5, pp. 4–10.

Deane, K.A. and Degner, L.F., 1998. Information needs, uncertainty, and anxiety in women who had a breast biopsy with benign outcome. Cancer Nurs. 21 2, pp. 117–126.

Friedemann M. The concept of family nursing. In Wegner GD, Alexander RJ, editors. Readings in family nursing. Philadelphia: JB Lippincott Company; 1993. p. 13–23.

Halm, M., Titler, M.G., Kleiber, C., Johnson, S., Montgomery, L., Craft, M. et al., 1993. Behavioural responses of family members during critical illness. Clin. Nurs. Res. 2 4, pp. 414–437.

Keogh, S., 2001. Parents' experiences of the transfer of their child from the PICU to the ward: a phenomenological study. Nurs. Crit. Care 6 1, pp. 7–13.

Knaus, W.A., Wagner, D.P., Draper, E.A., Zimmerman, J.E., Bergner, M., Bastos, P.G. et al., 1991. The APACHE III prognostic system: risk prediction of hospital mortality for critically ill hospitalized adults. Chest 100 6, pp. 1619–1639.

Leith, B.A., 1999. Patients' and family members' perceptions of transfer from intensive care. Heart Lung 28 3, pp. 210–218.

Leske, J.S., 1991. Overview of family needs after critical illness: from assessment to intervention. AACN Clin. Issues Crit. Care Nurs. 2 2, pp. 220–226.

Leske, J.S., 1992. Needs of adult family members after critical illness: prescriptions for interventions. Crit. Care Nurs. Clinics N. Am. 4 4, pp. 587–596.

Lynn-McHale, D.J., Corsetti, A., Brady-Avis, E., Shaffer, R., McGrory, J. and Rothenberger, C., 1997. Pre-operative ICU tours: are they helpful?. Am. J. Crit. Care 6 2, pp. 106–115.

Lynn-McHale DJ, Smith A. Comprehensive assessment of families of the critically ill. In Wegner GD, Alexander RJ, editors. Readings in family nursing. Philadelphia: J.B. Lippincott Company; 1993. p. 309–28.

McDowell I, Newell C. Measuring health: a guide to rating scales and questionnaires. 2nd ed. Oxford: Oxford University Press; 1996.

McShane, R.E., 1991. Family theoretical perspectives and implications for nursing practice. AACN Clin. Issue Crit. Care Nurs. 2 2, pp. 210–219.

Mast, M.E., 1995. Adult uncertainty in illness: a critical review of research. Sch. Inq. Nurs. Pract.: Int. J. 9 1, pp. 3–24.

Mishel, M.H., 1981. The measurement of uncertainty in illness. Nurs. Res. 30 5, pp. 258–263.

Mishel, M.H., 1983. Adjusting the fit: development of uncertainty scales for specific clinical populations. West. J. Nurs. Res. 5 4, pp. 355–370.

Mishel, M.H., 1988. Uncertainty in illness. IMAGE: J. Nurs. Scholarsh. 20 4, pp. 225–232.

Mishel MH. Uncertainty in Illness scales manual. University of North Carolina: Chapel Hill; 1997.

Mishel, M.H. and Braden, C.J., 1987. Uncertainty a mediator between support and adjustment. West. J. Nurs. Res. 9 1, pp. 43–57.

Mishel, M.H. and Braden, C.J., 1988. Finding meaning: antecedents of uncertainty in illness. Nurs. Res. 37 2, pp. 98–103.

Mishel, M.H. and Sorenson, D.S., 1991. Uncertainty in gynaecological cancer: a test of the mediating functions of mastery and coping. Nursing Research 40 3, pp. 167–171.

Northouse, L.L., Laten, D. and Reddy, P., 1995. Adjustment of women and their husbands to recurrent breast cancer. Res. Nurs. Health 18, pp. 515–524.

Poe, C.M., 1982. Minimizing stress-of-transfer responses. Dimensions Crit. Care Nurs. 1 6, pp. 364–374.

Rukholm, E., Bailey, P., Coutu-Wakulczyk, G. and Bailey, W.B., 1991. Needs and anxiety levels in relatives of intensive care unit patients. J. Adv. Nurs. 16, pp. 920–928.

Sherbourne, C.D. and Stewart, A.L., 1991. The MOS social support survey. Soc. Sci. Med. 32, pp. 705–714.

Spatt, L., Ganas, E., Hying, S., Kirsch, E.R. and Koch, M., 1986. Informational needs of families of intensive care unit patients. Qual. Rev. Bull. 12 1, pp. 16–21.

Spielberger CD. State-Trait Anxiety Inventory (Form Y). Redwood City: Mind Garden Inc; 1983.

Ward, C.R., Constancia, P.E. and Kern, L., 1990. Nursing Interventions for families of cardiac surgery patients. J. Cardiovasc. Nurs. 5 1, pp. 34–42.

Wineman, N.M., Schwetz, K.M., Goodkin, D.E. and Rudick, R.A., 1996. Relationships among illness uncertainty, stress, coping and emotional well-being at entry into a clinical drug trial. Appl. Nurs. Res. 9 2, pp. 53–60.

Wong, C.A. and Bramwell, L., 1992. Uncertainty and anxiety after mastectomy for breast cancer. Cancer Nurs. 15 5, pp. 363–371.

Yarcheski, A., 1988. Uncertainty in illness and the future. West. J. Nurs. Res. 10 4, pp. 401–413.