# The effect of family members' supportive presence in neurological intensive care unit on their anxiety

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## Abstract

**Background and Aim:** Patients' hospitalization is associated with family members' anxiety. Fulfilling family members' needs such as providing them with information and helping them have physical contacts with their patients can alleviate their anxiety. This study was conducted to investigate the impacts of family members' supportive presence in a neurological intensive care unit on their anxiety

**Methods:** In this clinical trial, sixty family members of patients who had been hospitalized in a neurological intensive care unit were recruited and randomly allocated to the experimental and the control groups—30 persons in each group. Family members' anxiety was evaluated by using the Hospital Anxiety and Depression Scale. The study intervention was the provision of basic care services to patients by their family members twice a day for six days during the first week of hospitalization in intensive care unit. Study data were analyzed by using the SPSS software (11.5) and by conducting the paired and the independent-samples t, the Chi-square, and the Fisher's exact tests.

**Results:** At the beginning of the study, respectively 90% and 86.7% of patients' family members in the experimental and the control groups suffered from anxiety. Before the study, the difference between the groups regarding the mean score of anxiety was not statistically significant (P=0.767). Compared with pretest readings, the posttest mean scores of anxiety in the experimental and the control groups decreased by 7.87 and 2.74 units, respectively. The pretest-posttest mean difference of anxiety score in the experimental group was significantly greater than the control group (P<0.001).

**Conclusion:** Family members' supportive presence in neurological intensive care unit significantly reduces their anxiety. Critical care nurses can alleviate family members' anxiety through facilitating their supportive presence at their patients' bedside

**Key Words:** Anxiety; Intensive Care Units; Nervous System Diseases; Family

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## Introduction

As the building blocks of communities, families can maintain and improve their members' physical, cultural, spiritual, psychological, and social health and well-being. However, hospitalization of a family member in intensive care unit (ICU) significantly affects family's ability to function effectively and causes stress and anxiety for both patients and family members (1). Witnessing a suffering hospitalized family member who is unable to communicate and is surrounded by sophisticated medical equipments brings stress and anxiety to other family members (2). They may continue to suffer from anxiety throughout the course of hospitalization due to their patients' unexpected hospitalization and physical separation from other family members (3, 4).

Anxiety is the commonest psychological problem among the family members of critical care patients. The prevalence of anxiety and depression among these family members has been reported to be 35%–73% and 15%–35%, respectively (5, 6). These prevalence rates can increase respectively up to 80% and 70% when the prognosis of patient is poor (3). Kentish-Barnes et al. (2009) found that 69.1% of 836 family members participating in their study suffered from anxiety (7). McAdam et al. (2009) also reported an anxiety prevalence rate of 73.4% among 544 family members of critical care patients (8). The results of a study conducted by Rabie-Siahkali et al. (2010) in Iran also showed that 77.1% of critical care patients' family members experienced anxiety (1).

Different strategies have been developed for alleviating psychological problems of critical care patients' family members. Studies have shown that strategies such as involving them in the process of clinical decision making (9) or in morning visits (10), providing them with regular educations (11), establishing regular contacts with them and giving them video or written educations (12), and assigning the responsibility of some aspects of care delivery to them (13) were effective in alleviating the symptoms of psychological distress such as depression and anxiety among family members. In other words, helping family members have closer contacts with their patients reduces their psychological stress (14).

In holistic approach to critical care nursing, besides providing care to patients, family members are also involved. For instance, they are informed about the courses of patients' diseases and treatments and are allowed to attend patients' bedside (15). However, by restricting family members' presence in ICUs, nurses' interaction with them is also diminished (16). As family members expect to actively participate in clinical decision making and care providing, particularly in life-threatening situations, involving them in patient care can alleviate their anxiety (17). It is noteworthy that the incidence of anxiety is much greater among family members of patients who experience severe brain injuries and hence, they need stronger support (18).

The results of our literature review showed that most of the previous studies on supporting families have been conducted in cardiac or medical-surgical care units and little evidence exists regarding providing support to the family members of patients hospitalized in neurological ICUs. Consequently, this study was conducted to investigate the impacts of family members' supportive presence in neurological ICU on their anxiety.

## Methods

This randomized clinical trial was conducted from February to August 2011 in Shahid Kamyab Hospital, Mashhad, Iran. The findings of our pilot study as well as the sample size calculation formula for the comparison of two means were used for calculating the study sample size. The results of the formula revealed that with a confidence interval of 0.99 and a power of 0.90, 38 patients were needed for each study group. Therefore, 76 family members (one member for each patient) were recruited. Eight patients from the control group were excluded due to experiencing death (five

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patients), being discharged from ICU (two patients), and family members' withdrawal from the study (one patients). On the other hand, four patients in the experimental group experienced death and four were discharged from ICU and hence, eight patients from this group were excluded.

Sampling was performed conveniently. Patients who had an age of eighteen or older, had experienced severe brain trauma, and had a Glasgow Coma Scale (GCS) score of 5–10 were recruited. Patients were allocated to the experimental or the control group by using the Random numbers table. On the other hand, one first-degree family member (i.e. spouse, mother, father, children, or siblings) was selected for each patient. The inclusion criteria for family members were having an age of eighteen or greater, being literate, and being able to participate in the study for six days (the experimental group) or attend the study setting at the sixth day (the control group). Family members were excluded If they opted for withdrawing from the study, were unable to perform the assigned responsibilities, or failed to attend the study setting for two sessions or more (the experimental group) or at the sixth day of the study (the control group).

After obtaining their consent, family members were invited to complete the study questionnaires. Support and services provided to each patients in the experimental group by his/her family member included of establishing physical contact, arranging hair, moisturizing lips, cleansing the nose and the eyes, applying emollient creams on the hands and the feet, and helping hospital staffs position their patient. We also provided safety tips to family members in order to ensure patients' safety. Family members attended their patients' bedside and provided services twice a day for six days—twelve sessions in total. As the hospital visitation hour was 14:30–15:30, the time of the sessions was 12:00–13:00 and 18:00–19:00. The length of each session was 45–60 minutes. At the end of the sixth day, family members were invited to re-complete the study questionnaires.

Study data were gathered by using a demographic questionnaire for family member, a demographic and clinical data questionnaire for patients, and the Hospital Anxiety and Depression Scale (HADS). The HADS contains seven items on anxiety and seven items on depression. Each HADS item is scored 0–3. Consequently, the total depression and anxiety scores are 0–21. Scores less than 10 show normal condition while scores 10–21 show 'depression and anxiety disorder'. The HADS is a valid and reliable scale which has been used widely for assessing anxiety and depression among family members of critical care patients (1, 3, 7, and 15). The validity and the reliability of the Persian HADS have been also confirmed (19 and 20). In this study, we only used the anxiety subscale of the HADS.

The SPSS software (v. 11.5) was used for data analysis. Measures of descriptive statistics such as frequency distribution, mean, standard deviation (SD), median, and interquartile range (IQR) were used for presenting the data. Moreover, the Mann-Whitney and the Chi-square tests were conducted for testing the matching of the study groups while the paired- and the independent-samples t as well as the Chi-square and the Fisher's exact tests were performed for comparing the study groups regarding anxiety scores. We also used general linear model method (repeated measures) for controlling the effects of confounding variables. Finally, the correlation of anxiety and GSC scores were examined through doing the Spearman correlation coefficient test. The levels of confidence, power, and significance were set at 0.95, 0.80, and 0.05, respectively.

We strived to comply with all the codes of research ethics. Moreover, patients' family members who were diagnosed with anxiety were referred to a psychologist for receiving treatments. If they wished and hospital administrators permitted, family members were able to continue the daily visitation program after the study. This study was registered in the Iranian Registry of

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## Results

Sixty family members with a mean age of 32.5±9.28 years completed the study among whom, 37 (61.7%) were female. Twenty five percent of family members were patients' mothers and 70% of them lived with their patients. The median of patients' age was 22.5 years and 88.3% of them were male. The frequency distribution of family members' demographic characteristics and the results of the tests for assessing the matching of the groups are shown in Table 1. The median of GCS score was 7.00 and there was no significant difference between the groups regarding it (P=0.402)(Table 2).

**Table 1: Frequency distribution of family members' demographic characteristics in both study groups**

| Variable | | Experimental N=30 N(%) | Control N=30 N(%) | Total N=60 N(%) | The results of the statistical tests | |
|---|---|---|---|---|---|---|
| Gender | Female | 21(70.0) | 16(53.3) | 37(61.7) | $X^2$=1.763 | Chi-Square p=0.184 |
| | Male | 9(30.0) | 14(46.7) | 23(38.3) | | |
| Marital status | Single | 1(3.3) | 5(16.7) | 6(10.0) | $X^2$=4.744 | Chi-Square p=0.093 |
| | Married | 27(90.0) | 25(83.3) | 52(86.7) | | |
| | Widowed | 2(6.7) | 0(0.0) | 2(3.3) | | |
| Educational status | Primary | 5(16.7) | 10(33.3) | 15(25.0) | Z=0.325 | Mann-Whitney p=0.745 |
| | Junior high school | 13(43.3) | 8(26.7) | 21(35.0) | | |
| | Diploma | 11(36.7) | 7(23.3) | 18(30.0) | | |
| | University | 1(3.3) | 5(16.7) | 6(10.0) | | |
| Kinship with patient | Spouse | 5(16.7) | 3(10.0) | 8(13.3) | P=0.706 | |
| | Son | 2(6.7) | 1(3.3) | 3(5.0) | P=1.00 | |
| | Daughter | 1(3.3) | 2(6.7) | 3(5.0) | P=1.00 | |
| | Mother | 11(36.7) | 14(13.3) | 15(25.0) | $X^2$=4.356 | P=0.037 |
| | Father | 0(0.0) | 5(16.7) | 5(8.3) | P=0.052 | |
| | Sister | 5(16.7) | 7(23.3) | 12(20.0) | $X^2$=0.417 | P=0.519 |
| | Brother | 6(20.0) | 8(26.7) | 14(23.3) | $X^2$=0.373 | P=0.542 |
| Live with patient | Yes | 21(70.0) | 21(70.0) | 42(70.0) | $X^2$=0.000 | P=1.00 |
| | No | 9(30.0) | 9(30.0) | 18(30.0) | | |
| Place of residence | Mashhad | 13(43.3) | 12(40.0) | 25(41.7) | $X^2$=0.069 | P=0.793 |
| | Other cities | 17(56.7) | 18(60.0) | 35(58.3) | | |
| Previous history of family members' hospitalization in ICU | Yes | 4(139.3) | 0(0.0) | 4(6.7) | | |
| | No | 26(86.7) | 30(100.0) | 56(93.3) | $P^*$=0.112 | |

**Table 2: Patients' GCS scores at the first and the sixth days**

| Variable | Group | | The results of the Mann-Whitney test | |
|---|---|---|---|---|
| | Experimental | Control | | |
| | Median (IQR) | Median (IQR) | z | P-value |
| GCS score at day 1 | 7.00(2.00) | 7.00(2.00) | –0.838 | 0.402 |
| GCS at day six | 11.00(6.25) | 7.00(2.00) | –2.794 | 0.005 |
| Pretest-posttest mean difference of GCS score | –3(5.00) | 0.00(2.25) | –3.098 | 0.002 |

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About 88.3% of the family members suffered from anxiety (i.e. had a HADS score of 10–21) at the beginning of the study. The Fisher's exact test showed that before the study, there was no significant difference between the study groups concerning the prevalence of anxiety among family members. However, the results of the Chi-square test revealed that after the study, the prevalence of anxiety among family members in the experimental group was significantly lower than the control group (P=0.003)(Table 3).

On the other hand, the independent-samples t- test showed that before the intervention, the study groups did not significantly differ from each other in terms of anxiety mean score. However, after the study, the level of anxiety in the experimental group was significantly lower than the control group (P<0.001)(Table 4). Moreover, the pretest-posttest mean difference of anxiety score in the experimental group was significantly greater than the control group (P<0.001)(Table 4). The results of the paired-samples t test also showed that compared with pretest readings, the mean score of anxiety decreased significantly after the study in both the experimental (P<0.001) and the control (P=0.004) groups (Table 4).

The general linear model was used for controlling the effects of the confounding variables on anxiety scores. Consequently, variables with a P value of less than 0.2 in the homogeneity test were selected and entered into the model. The results of the general linear model revealed that the confounding variables of gender, marriage, kinship with patient (father or mother), and previous history of family members' hospitalization in ICU had no significant effects on family members' anxiety score (Table 5).

The Spearman correlation coefficient test indicated that the pretest anxiety score of family members in both the study groups was not significantly correlated with patients' GCS score (P=0.455). After the study, this correlation was also not significant in the control group (P=0.264) while in the experimental group, it was statistically significant (P=0.035).

**Table 3: Frequency distribution of family members' anxiety before and after the study**

| Group | Day 1 | | Day 6 | |
|---|---|---|---|---|
| | Without anxiety | With anxiety | Without anxiety | With anxiety |
| | N (%) | N (%) | N (%) | N (%) |
| Experimental | 3(10.0) | 27(90.0) | 25(83.3) | 5(16.7) |
| Control | 4(13.3) | 26(86.7) | 14(46.7) | 16(53.3) |
| Total | 7(11.7) | 53(88.3) | 39(65.0) | 21(35.0) |
| The results of the statistical tests | P value=1<br>The Fisher's exact test | | Pvalue=0.003 $X^2$=8.864<br>The Chi-square test | |

**Table 4: Family members' anxiety scores at the first and the sixth days**

| Variables | Experimental | Control | The results of the independent-samples t test | | |
|---|---|---|---|---|---|
| | Mean ± SD | Mean ± SD | T | df | P value |
| Anxiety score at the first day | 14.67±3.26 | 14.97±4.43 | –0.298 | 58 | 0.767 |
| Anxiety score at the sixth day | 6.80±4.56 | 12.23±5.27 | –4.265 | 58 | 0.000 |
| The results of the paired-samples t test | P<0.001<br>t=7.61<br>df=29 | P=0.004<br>t=3.148<br>df=29 | - | - | - |
| The pretest-posttest mean difference of anxiety score | –7.86±5.66 | –2.37±(4.75) | –4.803 | 58 | 0.000 |

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**Table 5: General linear model coefficient for controlling the effects of the confounding variables on family members' anxiety score**

| Variables | Coefficients of the linear model β | t | P value |
|---|---|---|---|
| Group (Experimental) | –4.492 | –2.843 | 0.006 |
| Gender (Female) | –0.787 | –0.460 | 0.648 |
| Marriage (Single ǂ) | 4.026 | 0.805 | 0.424 |
| | 2.418 | 0.566 | 0.574 |
| Kinship with patients (Mother ǂ) | –1.495 | –0.775 | 0.442 |
| (Father●) | –0.501 | –0.174 | 0.862 |
| Previous history of family members' hospitalization in ICU (Yes) | 0.983 | 0.326 | 0.746 |

ǂ Versus other types of marital status ● Versus other types of kinship

## Discussion

The findings of the current study showed that family members' supportive presence in ICU significantly alleviated their anxiety. Most of the previous studies on the anxiety of critical care patients' family members have been conducted by employing descriptive designs (12). Moreover, we could not retrieve any interventional study from the existing literature on the anxiety of family members whose patients suffered from brain trauma and were hospitalized in ICU. The only study that was similar to our study in aim and intervention, was an interventional study conducted by Rodriguez Martinez et al. (2003) in a general ICU located in Spain. They used the Spielberger Anxiety Scale for data collection and found that most family members in both study groups suffered from anxiety at the first day of their patients' admission to ICU. In the experimental group, one first- or second-degree family member of each patient was invited to attend ICU and provide basic care services during the first post-admission days. Rodriguez Martinez et al. (2003) finally found that family members' anxiety reduced significantly after their intervention. In their study, the mean of patients and family members' ages (60 and 50 years, respectively) as well as the percentage of spousal kinship with patients (57.2%) were greater than our study while their intervention was shorter by three days. Moreover, all of their participating patients were conscious (4). Evidence shows that all these differences can significantly affect the incidence of anxiety among critical care patients' family members (1, 8, 14, 18, 21, 22). Nonetheless, findings reported by Rodriguez Martinez et al. (2003) were almost similar to our findings, confirming the fact that providing family members with the opportunity of attending ICU and participating in basic care activities can fulfill their needs and alleviate their psychological distress and anxiety.

Our findings were also in line with the findings of a clinical trial conducted by Lautrette et al. (2007) in 22 ICUs located in France. They found that holding structured conferences for the family members of dying patients and providing them with relevant educational brochures significantly relieved their anxiety, depression, and post-traumatic stress syndrome (12). Chien et al. (2006) also conducted a quasi-experimental study and found that educating critical care patients' family members by a trained nurse considerably alleviated family members' anxiety and enhanced their satisfaction (11). The congruence of the finding of the aforementioned studies with the findings of the present study—despite differences in the intervention, setting, and cultural backgrounds of the studies—confirms that fulfilling family members' needs, providing them with

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information, and facilitating their close interaction with their patients are effective in reducing their anxiety.

It is noteworthy that the severity of patients' underlying conditions and the course of treatments can affect family members' anxiety. Consequently, we examined the correlation of family members' anxiety with patients' GCS scores at days one and six. Study findings revealed that anxiety was not significantly correlated with GCS score at day one, implying that patients' comatose state and their inability to communicate were inherently associated with their family members' anxiety. After the study intervention, the level of consciousness of patients in the experimental group increased significantly compared with both the control group and the pretest readings. This finding can be due to the sensory stimulations provided to patients by their family members. Previous studies have also shown that sensory stimulations, particularly auditory stimulations, can elevate comatose patients' level of consciousness (23, 24). On the other hand, after the study, the correlation of family members' anxiety with patients' GCS score was statistically significant. This finding can be related to family members' reduced anxiety secondary to their patients' improved level of consciousness during the course of the study.

Study limitations

Family members' demographic and personality characteristics might have affected the study findings whose effects were attempted to be minimized through adopting the random allocation technique. Moreover, the score of anxiety could also have been affected by other types of daily life stressors. As a study limitation, we could neither control such stressors nor minimize their effects. In addition, there was no private place for data collection and hence, family members completed the HADS in hospital corridors. Therefore, environmental factors such as noises might have influenced family members' responses to the HADS items.

## Conclusion

Study findings indicate that family members' involvement in delivering basic care services to their hospitalized patients alleviates their anxiety. This was the first time in Iran which the effects of an intervention on the anxiety level of family members of patients with brain trauma was assessed. Family members found relief from spending time with their patients, doing something for them, and obtaining real-time, first-hand information about their patients' health status. Of course, the effects of the first author's presence in the study setting for facilitating family members' communication with healthcare professionals, supporting and informing them, and supervising their care delivery should not be neglected. Critical care nurses are undoubtedly the only source of support for patients' family members. Therefore, nurse managers are recommended to facilitate the fulfillment of family members' needs in critical care units through employing nurse liaison staffs.

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