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Original Research

Factors Affecting State and Trait Anxiety of Relatives of Hospitalized Patients

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Abstract
Introduction: Hospitalization is a stressful event for both patients and relatives. The aim of the study was to explore factors affecting state and trait anxiety of relatives of hospitalized patients.
Methods: In this cross-sectional study, was enrolled a convenience sample of 222 relatives of hospitalized patients in a public hospital in Athens, Greece. Data were collected by the completion of State-Trait Anxiety Inventory (STAI) which also included participants' characteristics. Data were analyzed using SPSS version 25, while the statistical significance level was $P<0.05$.
Results: Of the 222 relatives, 72 were men and 150 women. The average state and trait anxiety score was 45.6 and 42, respectively, within the possible range of scores (20-80) thus indicating moderate levels of anxiety. Moreover, state and trait anxiety was statistically significantly associated with gender, degree of information of patient's health, whether they had readjusted family responsibilities, whether they had financial worries, whether they experienced uncertainty about future and finally whether they were anxious about their ability to respond to patients care.
Conclusion: Factors associated with relatives' anxiety were gender, information regarding patient's health, family responsibilities, financial worries, uncertainty and anxiety to respond to patients' care. These factors need to be evaluated when planning psychological intervention to alleviate this emotional burden.

Introduction

Hospital admission is a stressor event for individuals of every age. Relatives of patients may experience emotional burden ranging from fear of the unknown to complete loss of control.[1-3] This burden mainly depends on patients' illness severity[1] or on their perceived helplessness and isolation. Strikingly more, when hospitalization is an unanticipated event or it demands stay in intensive care unit, the emotional burden seems to be heavier.[1-4]

Indisputably, patients' relatives are a significant contributor to the therapeutic regimen but at the same time, this role involves several worries.

Anxiety among relatives seems to vary through several stages of hospitalization (from the time of diagnosis until hospital discharge). Important factors that may trigger anxiety among relatives of hospitalized patients include financial issues, inability to care for their children, uncertainty about future, inadequate information, loss of time and energy, hospital length of stay, type of clinical ward (i.e. intensive care unit), physical and emotional separation, unmet needs during hospitalization, difficulties in decision making and several others.[4-9] After hospital discharge, anxiety of relatives tend to decrease, though sometimes it may persist for months or years after this experience.[9-11] Notably, prevalence of relatives' anxiety vary globally due to the methodology used including sample size which does not enable meaningful comparative research.[9]

It is therefore interesting to evaluate state and trait anxiety in clinical settings. More in detail, the State Anxiety Scale evaluates the current state of anxiety, and the Trait Anxiety Scale evaluates relatively stable aspects of "anxiety proneness." In clinical environment is essential to differentiate between temporary condition of state anxiety and the long-standing trait anxiety that one experiences on a day to-day basis.[8] Given that anxiety (both state and trait) may affect the way relatives cope with the challenge of hospitalization, it is easily understandable that prompt evaluation and treatment has a double benefit. Firstly, it alleviate relatives of this heavy emotional burden and secondly may empower their ability to provide effective care to the loved persons.

Complexity of hospitalized care along with relatives' needs are illustrating the importance to provide such an environment that does not permit the development of anxiety. Total patient care needs to incorporate assessment of relatives' anxiety as an integral part of health care process with ultimate goal to minimize anxiety.[2,3] However, available data on relatives' anxiety during the period of crisis at hospital still remain limited.

The aim of this cross-sectional study was to explore levels of state and trait anxiety that experience relatives of hospitalized patients as well as the associated factors.

Materials and Methods

In this cross-sectional study, 222 relatives of hospitalized patients in two public hospital in Athens, were recruited. This sample was a convenience sample.

All relatives entered the study regardless of the type or severity of illness of their patient. More in detail, criteria for relatives' inclusion in the study were as follows:[1] having a relative (with any type of kinship) who was admitted to hospital for at least before 48 hours,[2] age over 18 years old,[3] ability to write, read, and understand the Greek language and[4] ability to read and sign the form of consent. Relatives' exclusion criteria were as follows[1]: having eye or hearing problems,[2] refuse to participate and[3] those who declared to receive anxiolytics or antidepressants, prior of hospitalization. Criteria for patients' inclusion in the study were as follows[1]: age over 18 years old and[2] hospitalization for at least before 48 hours.

Selection of relatives was initially performed after the daily check of patients' list in order to identify individuals being hospitalized for more than 48 hours and verify the inclusion criteria. The approach of relatives took place in the waiting room and in the afternoon shift, when patients had to perform no clinical or physical examinations which may elevate their anxiety. The relatives that agreed to participate in the study were invited to a private room to guarantee their privacy.

The "State-Trait Anxiety Inventory (STAI)" was used to assess the anxiety of relatives. The State-trait scales, meaning temporary and permanent anxiety, consist of 20 questions respectively that evaluate how respondents felt at the time they were completing the questionnaire or in general. Respondents were able to answer each question on a Likert type scale. In each of the four-point grades scores of 1-4 were given. The scores attributed to the questions are summed leading to a final score of temporary and permanent anxiety respectively. Higher score values indicate higher levels of anxiety.[12]

In terms of reliability of the Greek translation of the STAI, Cronbach's alpha was 0.93 for the State and 0.92 for the trait subscale. The Pearson correlation coefficient between state and trait subscales was 0.79.[13] The validity was not measured in this study.

Demographic characteristics as well as other self reported items regarding hospitalization, care to patients, frequency of visits, kinship with patient, level of provided information, uncertainty were also recorded.

Categorical data are presented with absolute and relative frequencies, whereas continuous data are presented with mean and standard deviation (SD). The normality of the data was verified by Kolmogorov-Smirnov test and graphically with histograms and Q-Q plots. The *t* test and ANOVA criteria were used to evaluate the association between anxiety scores and caregiver's characteristics. Multiple linear regression was applied to assess the effect of the characteristics on the state and trait anxiety of relatives. Results are presented with β coefficients and 95% confidence intervals.

The observed significance level of 0.05 was considered statistically significant. All statistical analyzes were performed with SPSS version 25 (SPSS Inc., Chicago, IL, USA).

Results

Men accounted for 32.4% of the sample, while 36% of the sample was over 50 years of age (Table 1).

Relatives came from various clinical wards in hospitals while 27.5% were the husbands or wives of hospitalized patients. Furthermore, 33.3% was staying in the hospital with the patient, 29.7% visited the patient once a day, 41% were "very well" informed about the patient's health, 75.7% had re-adjusted family responsibilities, 42.3% had "many or several" financial worries, 20.7% had a lot of anxiety to respond to patient care ad finally, 23.4% experienced a lot of uncertainty about future (Table 1).

Regarding state and trait anxiety of relatives, the mean (SD) score was 45.6 (13.4) and 42 (11.7) in state and trait anxiety, respectively. These values, with respect to the possible range of scores (range 20-80) that may occur, indicate moderate levels of anxiety among relatives.

State anxiety of relatives was found to be statistically significantly associated to gender ($P=0.002$), degree of information of patient's health ($P=0.016$), whether they had readjusted family responsibilities ($P=0.006$), they had financial worries, or uncertainty about future ($P=0.001$ and $P=0.001$ respectively) and finally whether they were anxious about their ability to respond to patient care ($P=0.001$).

Similar results were also observed for the factors associated with trait anxiety. These factors were gender ($P=0.001$), age ($P=0.027$), degree of information of patient's health ($P=0.031$), whether they had re-adjusted family responsibilities ($P=0.034$), they had financial worries ($P=0.001$), they experienced uncertainty about future ($P=0.001$) and finally whether they were anxious about their ability to respond to patient care ($P=0.001$).

Multiple linear regression was also performed to assess the effect of the characteristics found to be statistically significantly associated with the state and trait anxiety of relatives (Table 2). Relatives who were little or no informed about the health of the patient had 5.86 and

Table 1. Relatives' characteristics (N=222)

Variable	No. (%)
Gender	
Male	72 (32.4)
Female	150 (67.6)
Age (y)	
<40	67 (30.2)
41-50	75 (33.8)
51-60	54 (24.3)
>60	26 (11.7)
Ward	
Pathology	33 (14.9)
Surgery	42 (18.9)
ICU	34 (15.3)
Orthopedics	38 (17.1)
Cardiology	40 (18.0)
Neurosurgery	35 (15.8)
Kinship with patient	
Husband/wife	61 (27.5)
Parent	22 (9.9)
Cousin	28 (12.6)
Children	111 (50.0)
Frequency of visit	
Staying in hospital	74 (33.3)
Once a day	66 (29.7)
Twice a day	46 (20.7)
Day by day	22 (9.9)
Other	14 (6.3)
Degree of information about patient's health	
Very	91 (41.0)
Enough	111 (50.0)
Little	19 (8.6)
Not at all	1 (0.5)
Have you re-adjusted your family responsibilities, due to hospitalization?	
Yes	168 (75.7)
No	54 (24.4)
Do you have financial worries, due to hospitalization?	
Very	40 (18.0)
Enough	54 (24.3)
Little	63 (28.4)
Not at all	65 (29.3)
Are you anxious about your ability to respond to care?	
Very	46 (20.7)
Enough	67 (30.2)
Little	65 (29.3)
Not at all	44 (19.8)
Do you experience uncertainty about the future?	
Very	52 (23.4)
Enough	69 (31.1)
Little	69 (31.1)
Not at all	32 (14.4)

5.48 points higher state and trait anxiety respectively than those who were very well informed (β = 5.86, 95% CI: 0.07-11.65, $P=0.047$ and β = 5.48, 95% CI: 0.04-10.93, $P=0.048$). In addition, relatives who felt little anxious about responding to patient care had 7.11 points lower state anxiety than those who felt very anxious (β = -7.11, 95% CI: -12.08 – -2.13, $P=0.005$). Finally, relatives who reported little or no uncertainty for the future had 8.13 and 9.54 lower state anxiety levels respectively than those who experienced a lot of uncertainty (β = -8.13, 95% CI: -13.16- -3.09, $P=0.002$ and β = -9.54, 95% CI: - 15.85- -3.23, $P=0.003$ respectively) and 8.49 and 10.22 points lower trait anxiety respectively (β = -8.48, 95% CI: - 13.30 – -3.69, $P=0.001$ and β = -10.22, 95% CI: - 16.34- – 4.10, $P=0.001$ respectively).

Discussion

The present study showed moderate levels of anxiety among relatives visiting hospitalized patients. Relatives frequently put aside their needs and try to manage daily needs of the loved person including tasks such as bathing, eating, taking medicine, or mobilization activities.[8,13-15]

Paparrigopoulos et al.,[16] showed among thirty-two first degree relatives of hospitalized patients, high levels of anxiety and depressive symptoms (97% and 81%, respectively) on the first week of admission. Konstanti et al.,[17] demonstrated high levels of anxiety on the third day of admission among 223 Greek family members of ICU. As for the kinship Maruiti et al.,[10] showed that sons and daughters were representing 43.6% of their sample total which is close to the present results. Pochard et al.,[18] found symptoms of anxiety in 73.4% of family members.

It is noteworthy, that anxious relatives may transfer their fears and grievances to the patient, which in turn affect negatively their treatment.

Factors associated with anxiety include patient-related factors (absence of chronic disease), family-related factors (spouse, female gender, desire for professional psychological help, help being received by general practitioner), and caregiver-related factors (absence of regular physician and nurse meetings, absence of a room used only for meetings with family members).[18]

Relatives who were "little or no" informed about the patients' health experienced high levels of state-trait anxiety. Chatzaki et al.,[19] indicated provision of information and reassurance as the most important needs among 230 patients' relatives. Information is a significant contributor to anxiety (diminished or elevated). In the initial stage, relatives passively absorb the provided information while afterwards they start to work out with it. When information leads to false hope or is inadequate then anxiety is increasing. Additionally more, patients often report lack of empathy and effective communication from health care providers which are triggering anxiety to relatives. Verbal information may contribute to disempowerment and passivity as relatives are frequently

Table 2. Impact of factors on state and trait anxiety

Variable	State anxiety β (95% CI)	*P* value[a]	Trait anxiety β (95% CI)	*P* value[a]
Gender				
Male	Ref.		Ref.	
Female	2.92 (-0.50-6.34)	0.093	2.74 (-0.58-6.07)	0.105
Age (y)				
<40	-		Ref.	
41-50	-		0.68 (-3.07-4.44)	0.719
51-60	-		1.96 (-2.27-6.18)	0.362
>60	-		-1.29 (-7.32-4.74)	0.674
Degree of information of patient's health				
Very	Ref.		Ref.	
Enough	0.48 (-2.84-3.80)	0.777	1.22 (-1.96-4.40)	0.449
Little/Not at all	5.86 (0.07-11.65)	0.047*	5.48 (0.04-10.93)	0.048*
Have you re-adjusted your family responsibilities, due to hospitalization?				
Yes	Ref.		Ref.	
No	1.31(-2.93-5.56)	0.543	1.42(-2.68-5.53)	0.494
Do you have your financial worries?				
Very	Ref.		Ref.	
Enough	2.81 (-2.14-7.76)	0.264	3.81 (-0.83-8.44)	0.107
Little	-0.56 (-5.78-4.65)	0.832	0.67 (-4.24-5.58)	0.788
Not at all	-2.91 (-8.84-3.01)	0.334	-0.74 (-6.33-4.85)	0.795
Are you anxious about your ability to respond to patient care?				
Very	Ref.		Ref.	
Enough	-3.02 (-7.50-1.46)	0.185	0.18 (-4.04-4.41)	0.933
Little	-7.11 (-12.08--2.13)	0.005*	0.73 (-4.02-5.48)	0.763
Not at all	-4.22 (-10.19-1.76)	0.165	3.91 (-1.79-9.61)	0.178
Do you experience uncertainty about the future?				
Very	Ref.		Ref.	
Enough	-1.69 (-6.13-2.76)	0.455	-2.37 (-6.66-1.92)	0.278
Little	-8.13 (-13.16- -3.09)	0.002*	-8.49 (-13.30- -3.69)	0.001*
Not at all	-9.54 (-15.85- -3.23)	0.003*	-10.22 (-16.34- -4.10)	0.001*

* Statistically significant; [a] Multiple linear regression.

unable to refer to information or may not remember it. Contrariwise, providing written material in the form of information booklets or summary letters may reduce confusion, and facilitate the long-term treatment success. Accurate information along with assessment of relatives' beliefs, concerns and expectations may be an essential measure to diminish anxiety and misunderstandings.[15,20,21]

High levels of state and trait anxiety had participants who experienced financial worries and those who reported re-adjustment to their family responsibilities. Similarly, Acaroğlu et al.,[3] showed that 56.7% of family members experienced financial worries due to hospitalization of their loved person as well as high levels of state and trait anxiety among families members who reported inability to care for children (41.7%), and inability to attend school or work (43.3%). A relevant study in Greece showed that 66% of relatives reported financial worries, at the day of hospital discharge.[19]

Moreover, high levels of anxiety had participants who reported uncertainty about future. Interestingly, hospital admission is throwing families into crisis, helplessness, and confusion due to the unfamiliarity of the environment, the treatment procedures and the uncertainty of the patients' clinical outcome. Inevitably, doubts are the source of unpleasant feelings such as anxiety and angst at a time when coping resources are not readily mobilized and the healthcare team is focused on the patient. Consequently, relatives' concerns are commonly overlooked or become secondary to caring for the patient.[8,9,22] Uncertainty, undermines coping mechanisms, adaption to illness, and attitudes concerning the actions needed to reduce the risk of anxiety during hospitalization.[23]

The present study has some limitations. Firstly, convenience sampling is not representative of all relatives-population with hospitalized persons living in Greece, thus the results cannot be generalized. Secondly, the study design was cross-sectional and not longitudinal, thus not permitting investigation for causal relation between state

-trait anxiety and relatives' self-reported characteristics of the patients or demographic characteristics. Finally, there was no other assessment that would allow evaluation of possible changes in anxiety levels of relatives through time.

Conclusion

High levels of state and trait anxiety had relatives who:were little or no informed about the health of the patient, had re-adjusted their family responsibilities due to hospitalization, had financial worries due to hospitalization, experienced anxiety about their response to patient care and, experienced much uncertainty about the future.

Until now, no studies are available on how important these measurements (state -trait anxiety) really are with respect to their patients' outcomes.

Importantly, measurement of anxiety is supposed to help clinical decision-making since relatives who experience elevated anxiety may be excluded from any involve in the therapeutic regimen since they also need psychological support. These measurements may serve to alert clinicians to areas that would otherwise be overlooked.

In clinical settings, anxiety of relatives may fluctuate in all stages of patients' hospitalization. Understanding which factors are associated with anxiety is fundamental to the development of appropriate interventions that address the needs of relatives in clinical environment. Additionally, this emotional burden of relatives may be re-evaluated before hospital discharge so as to help patients' smooth transition to home.

Notably, a relative who does not experience anxiety may facilitate the long-term treatment success and patient's adjustment to the illness.

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Research Highlights

What is the current knowledge?

Hospitalization is a stressful event for both patients and relatives. Until now, no studies are available on how important these measurements (state -trait anxiety) really are with respect to their patients' outcomes. Available data on relatives' anxiety during the period of crisis at hospital still remain limited.

What is new here?

High levels of state and trait anxiety have relatives who are little or no informed about the health of the patient, had re-adjusted their family responsibilities due to hospitalization, have financial worries due to hospitalization, experience anxiety about their response to patient care and, experience much uncertainty about the future.

Ethical Issues

Written informed consent for participation in this study was obtained from all relatives after explanation of the purpose and procedure of the study. Participation in the study was on a voluntary basis and anonymity was preserved. Furthermore, all participants were informed of their rights to refuse or to discontinue their participation, according to the ethical standards of the Helsinki Declaration of 1983. The study was approved by the Medical Research Ethics Committees of the NIMTS hospital of Athens (REG NUM: 3/20/28.9.2018) and the Askepieion Voulas General Hospital of Athens (REG NUM: 10/8.10.2018).

Conflict of Interest

The authors declare no conflict of interest in this study.

Author's Contributions

Conceptualization: MP, AF, MS; Methodology: MP; Formal analysis: GV, AK and GG; Investigation: AF and MS; Data curation: MP and MK; Writing—original draft preparation: MP, AF and MS; Writing—review and editing: MP, GV; Supervision: MP; Project administration: AK and GG. All authors have read and agreed to the published version of the manuscript.

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