

IRRATIONAL BELIEFS, SURGICAL CONDITION SEVERITY AND AGE AS PREDICTORS OF PREOPERATIVE ANXIETY, DEPRESSION AND PSYCHOLOGICAL DISTRESS

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Abstract: Studies show that people with a high level of irrational beliefs tend to develop emotional problems. The purpose of this study was to investigate if irrational beliefs (demandingness, awfulizing, frustration intolerance and self-downing), perceived self-efficacy, patient age and surgical condition severity are predictors of preoperative anxiety, depression and distress. A total of 40 patients admitted to the Surgery Unit of the County Clinical Hospital Cluj-Napoca, Romania, were evaluated between February and June 2017. The results of the study show that age is the most important predictor, explaining 13.6% of the preoperative anxiety variance, 17.4 % of the preoperative depression variance and 14.2% of the preoperative dysfunctional distress variance. Overall irrationality has explained 11% of preoperative anxiety variance, 11.1% of preoperative depression and 7.4% of preoperative dysfunctional distress variance, while surgical condition severity has proven to be a significant predictor only for the preoperative dysfunctional distress, explaining 22.3% of this variance.

INTRODUCTION

For any surgical patient, surgery can be a source of emotional distress, anxiety and/or depression, with adverse impact on his or her mental and physical wellbeing and post-operative recovery.

Sometimes, the surgical patient may experience severe anxiety that goes beyond what is otherwise the normal feeling of fear of surgical intervention, reaching to full-blown panic attacks that, in turn, trigger adverse physiological responses in the patient, such as tachycardia, high blood pressure, arrhythmias, hyperventilation and postoperative pain. Typically, surgical patients experience the most intense anxiety during the preoperative period.(1) While the patient is waiting to be taken to surgery, he or she may experience an unfamiliar environment, loss of control, separation from friends and family, and dependence on strangers. The patient has time to think of actual or perceived risks, including death that may occur during surgery. Studies show that preoperative anxiety has been found to be correlated with high postoperative anxiety, increased postoperative pain, increased analgesic requirements and prolonged hospitalization.(2)

As for pre-surgical depression symptoms, studies show that these occurs in nearly 60% of patients to undergo surgery (3,4) and are associated with postoperative chronic pain, postoperative delirium, low immunity and an increased risk of infections;(5) that is why specialists recommend that surgical patients should benefit from psychological assistance during preoperative period, so as to alleviate their depression symptoms.

Self-efficacy is a construct based on Bandura's social-cognitive theory and refers to one's perceived ability to cope successfully with any situation. This belief determines how individuals feel, think, drive themselves into action and how they behave.(6) High perceived self-efficacy leads to personal achievements, reduces stress levels and decreases vulnerability to depression.

On the other hand, low perceived self-efficacy causes individuals to refuse to engage in tasks they perceive as much

too difficult, which is why they tend have lower aspirations and pursue less challenging goals. In addition, people with a low level of perceived self-efficacy are very vulnerable to emotional distress and depression.(7) The concept of perceived self-efficacy is increasingly recognized as a predictor of the changing and the maintaining of health behaviours. Self-efficacy beliefs are cognitions that determine whether health behaviour change will be initiated, how much effort will be expended and how long it will be sustained in the face of obstacles and failures.(8,9) In this study, self-efficacy was evaluated in relation to patients' beliefs about their ability to successfully cope with the surgery.

On the other hand, an important role in the occurrence and persistence of anxiety and depression symptoms is played by the irrational beliefs of surgical patients, which are a set of negative attitudes they manifest towards the surgical intervention and associated risks and consequences. Ellis et. al. (10) have identified four categories of irrational cognitions underlying the irrational thinking processes, which are characterized by absence of supporting evidence, logic and functionality, leading to dysfunctional behaviour and negative emotions. These irrational attitudes and beliefs include: demandingness – the must absolutist requirement, leaving no room for possible alternatives; catastrophizing – perceiving a negative event as the worst possible thing that can happen in a given situation; frustration intolerance – perceiving a situation as intolerable, unacceptable and impossible to live with; self-downing - the tendency of individuals to be extremely critical with themselves, with others and/or the surrounding world.(11)

A series of studies in the surgical field have shown catastrophizing (awfulizing) as the main cognition associated with dysfunctional cognitive coping, anxiety and depression and with increased postoperative pain. The role of catastrophizing as a predictor of pain, anxiety and depression was highlighted by several studies investigating different types of surgery.(12,13)

For example, a study published in 2014 showed that catastrophic thinking is strongly associated with disability and pain intensity in patients recovering after musculoskeletal

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trauma.(14) On the other hand, data provided by a meta-analysis (15) show low frustration tolerance to be most strongly associated with emotional distress of all the four types of irrational beliefs. Moreover, the meta-analysis indicates a moderate positive correlation between irrational beliefs and various types of distress such as anxiety, depression, anger and guilt. In addition, the same analysis shows that the age of the subjects and the severity of their medical condition are moderating the relationship between the level of irrational beliefs and the intensity of anxiety and depression symptoms.

For all these reasons, research in this field recommends health care professionals to apply anxiety alleviation measures to surgical patients, so as to protect them from developing panic attacks (16) and prevent and/or reduce the intensity of depressive symptoms associated with their somatic disorder. Therefore, psychologists play an important role in managing dysfunctional distress in surgical patients, because irrational cognitions correlate negatively with the development of adaptive behaviours, even if the patient does not experience clinically intensive psychological disorders.(17)

PURPOSE

The purpose of this study is to investigate the extent to which irrational beliefs (*demandingness, catastrophizing /awfulizing, frustration intolerance and self-downing*) and *perceived self-efficacy* are predictors of anxiety and depressive symptoms in surgical patients during the preoperative period. Also, taking into account the expected high variability of the participants in this trial - i.e. all the patients who were admitted to the Surgery Unit of the Cluj County Clinical Hospital in the period February-June 2017 - we have examined the extent to which the *age of the patients and the severity of their surgical condition* may predict depressive and/or anxious symptoms in surgical patients.

MATERIALS AND METHODS

Design

Descriptive, non-experimental clinical trial.

Participants

The trial included 40 participants (N = 40) admitted to the Surgery Unit of the County Hospital in Cluj-Napoca between February and June 2017, who suffered from a medical condition requiring surgery, of which 22 female (55%) and 18 male (45%) patients. The patients were aged between 22 and 86 years and the average age was 50.95 (SD = 16.22) for women and 51.83 (SD = 12.57) for men.

Measurements

Emotional Distress Profile (EDP) (18) is a 30-item scale that measures dysfunctional negative emotions (depression, anxiety) and functional negative emotions (sadness, worry).

Hospital Anxiety and Depression Scale (HADS) (19) evaluates the feelings of depression and anxiety in patients who have been treated for a wide variety of clinical problems. This scale contains 7 depression items and 7 anxiety items.

Attitude and Belief Scale, shortened version (ABSs) (9) is a 8-item scale measuring the following eight different types of beliefs (4 irrational and 4 irrational): *demandingness (DEM)*, *awfulizing (AWF)*, *low frustration tolerance (LFT)*, *self-downing (SD)*, *preference (PREF)*, *badness (BAD)*, *frustration tolerance (FT)*, *unconditional acceptance (UA)*.

Perceived Self-efficacy Scale (SES) (16) comprises a set of 10 statements about an individual's ability to cope with specific situations and to mobilize his or her cognitive, behavioural and motivational resources to successfully accomplish a task.

Surgical Condition Severity: A 3-level Likert Scale was used, on which low severity conditions (requiring only 2-3 days of postoperative hospitalization) were rated "1", moderate severity conditions (requiring 4-7 days of postoperative hospitalization) were rated "2" and high severity conditions (requiring > 7 days of post-operative hospitalization) were rated "3".

Procedure

The trial was conducted over a period of 5 months (February-June 2017) at the Surgery Department of the County Clinical Hospital in Cluj-Napoca. Patients were selected in the order of their presentation at the surgery ward of the hospital. The study sample included adults aged over 18, male and female, coming from urban and rural settlements. Surgery ranged from mild interventions for varicose veins or inguinal hernia to major surgery for morbid obesity, hysterectomy, colon cancer or ovarian tumours. After they had been informed about the study and had signed an informed consent, the patients were evaluated by means of the scales listed above (PDE, HADS, ABSs and SES), 1-2 days before the date of their surgery. The questionnaires were applied in paper-and-pencil format, in compliance with the standard procedures. Once the questionnaires were filled in, the rating described above was applied.

Statistical analysis of data

All the data collected during the study were subjected to statistical analysis, using the SPSS, version 20 software. The following types of statistical analyzes were performed: the descriptive statistical analysis for calculation of mean values, variations and dispersions, the correlations and step-by-step linear regression analysis for predictor assessment (irrational beliefs, age, severity of disease, self-efficacy). The established significance level is 0.05 ($p = 0.05$).

RESULTS

Descriptive analyzes of variables

Preoperative anxiety has recorded an average value of 6.65 (SD = 4.06), which corresponds to a normal level of anxiety. Only four of the 22 female subjects (10%) and 3 of the 18 male subjects (7.5%) experienced preoperative anxiety of clinical intensity.

Preoperative depression showed an average value of 4.23 (SD = 3.34), which corresponds to a normal level of depression. Only two of the 22 female subjects (5%) and 1 of the 18 male subjects (2.5%) experienced preoperative depression of clinical intensity.

Functional preoperative distress had an average of 22.10 (SD = 9.00), which corresponds to a low level of sadness and worry. *Dysfunctional preoperative distress* had an average of 22.10 (SD = 9.00), which corresponds to a moderate level of depression and anxiety.

Overall irrationality averaged 5.70 (SD = 0.48), which corresponds to a mean level of overall irrational beliefs. *Demandingness type (DEM)* of irrational beliefs stood at 2.03 (SD = 1.38) in average, which corresponds to a mean level of demandingness. *Awfulizing (AWF)* averaged 1.95 (SD = 1.44), which corresponds to a low level of awfulizing (catastrophizing). *Low frustration tolerance (LFT)* stood at an average of 1.55 (SD = 1.39), which corresponds to a low level of irrational beliefs of this type. *Irrational beliefs of self-downing type (SD)* showed an average of 0.60 (SD = 1.17), which corresponds to a very low level of self-downing.

Perceived self-efficacy averaged 32.65 (SD = 4.05), which corresponds to a moderate level.

Predictive analysis of variables

Analysis of predictors of anxiety symptoms

To evaluate the extent to which predictor variables explain the anxiety symptoms experienced by surgical patients during the preoperative period we conducted, at first, a Pearson correlation analysis, followed by a multiple step-by-step regression analysis, where we entered the predictor variables indicating the highest correlations with anxiety.

The correlation analysis has revealed some positive and significant correlations ($p < .05$) between preoperative anxiety and *global irrationality* ($r = 0.40, p = 0.005$), *awfulizing* ($r = 0.37, p = 0.008$), *low frustration tolerance* ($r = 0.30, p = 0.027$) and *age* ($r = 0.36, p = 0.01$); *perceived self-efficacy* correlated negatively and significantly with preoperative anxiety ($r = -0.26, p = 0.049$).

The step-by-step regression analysis, where each predictor was entered in the order of its significance, has shown that the most important predictor was *age*, which explained 13.6% of the preoperative anxiety variance (Model 1: $RSquare = 0.136$, $Fchange_{1,38} = 5.961$, sig. $Fchange = 0.019$). The next significant predictor was the *global irrationality*, which justified another 11% of the preoperative anxiety variance (Model 2: $RSquare = 0.246$, $Fchange_{1,37} = 5.427$, sig. $Fchange = 0.025$) (Table 1). Low frustration tolerance (LFT), awfulizing (AWF) and self-efficacy were excluded because they did not contribute significantly to the preoperative anxiety variance.

Analysis of depression predictors

To assess which of the predictor variables best explains the depressive symptom variance in the preoperative period, we initially conducted a Pearson correlation analysis and then a step-by-step multiple regression analysis in which we entered the predictor variables indicating the highest correlations. The correlation analysis has revealed positive and significant correlations ($p < .05$) between preoperative depression and *global irrationality* ($r = 0.41, p = 0.004$), *low frustration tolerance* ($r = 0.29, p = 0.034$) and *age* ($r = 0.41, p = 0.062$). Perceived self-efficacy did not correlate with preoperative depression.

The step-by-step regression analysis, where each

predictor was entered in its order of significance, has shown that the most important predictor was *age*, which explained 17.4% of the preoperative depression variance (Model 1: $RSquare = 0.174$, $Fchange_{1,38} = 8.006$, sig. $Fchange = 0.007$). The next significant predictor was the *global irrationality*, which justified another 11.1% of the preoperative depression variance (Model 2: $RSquare = 0.285$, $Fchange_{1,37} = 5.749$, sig. $Fchange = 0.022$) (Table 2). The low frustration tolerance (LFT) was excluded, as it did not significantly contribute to the preoperative depression variance.

Analysis of dysfunctional distress predictors

To identify which of the predictor variables best explains the dysfunctional distress variance, we conducted, at first, a Pearson correlation analysis and then a multi-step-by-step regression analysis in which we introduced the predictor variables indicating the highest correlations.

The correlation analysis has revealed positive and significant correlations ($p < .05$) between dysfunctional distress and *global irrationality* ($r = 0.39, p = 0.006$), *awfulizing* ($r = 0.45, p = 0.015$), *low frustration tolerance* ($r = 0.34, p = 0.015$), *age* ($r = 0.56, p < .001$) and the *severity of the surgical condition* ($r = 0.472, p = 0.001$). Perceived self-efficacy did not correlate with dysfunctional distress.

The step-by-step regression analysis has revealed that the most important predictor is the *surgical condition severity*, which explained 22.3% of dysfunctional distress variance (Model 1: $R Square = 0.223$, $Fchange_{1,38} = 10.881$, sig. $Fchange = 0.002$). The next significant predictor was *age*, which justified another 14.2% (Model 2: $R Square = 0.365$, $Fchange_{1,37} = 8.314$, sig. $Fchange = 0.007$).

The third significant predictor was the *global irrationality*, explaining another 7.4% of dysfunctional distress variance (Model 3: $R Square = 0.439$, $F1.36 = 4.717$, sig. $Fchange = 0.037$) (Table 3). Awfulizing (AWF) was excluded because it did not contribute significantly to the dysfunctional distress variance.

Table no. 1. Multiple step-by-step regression of preoperative anxiety predictors

Variables entered	B	Standard B error	Beta	t	sig.	RSquare	Fchange	Sig. Fchange
MODEL 1: Age						0.136	5.961	0.019
Age	0.103	0.042	0.368	2.441	0.019			
MODEL 2: Age, irrationality						0.246	5.427	0.025
Age	0.082	0.041	0.293	2.006	0.052			
Irrationality	0.397	0.170	0.341	2.330	0.025			

B = unstandardized (B) regression coefficient, Standard B error = standard coefficient error (deviation standard in the distribution of the survey of the coefficient), Beta = standardized Beta regression coefficient, t = the statistic of the significance test of the coefficient, sig. = statistical significance, RSquare = coefficient of determination (the proportion of the variance in the dependent variable that is predictable from the independent variable), Fchange = change in the response variable for one unit of change in the predictor variable while holding other predictors in the model constant, sig. Fchange = statistical significance of Fchange

Table no. 2. Multiple step-by-step regression of preoperative depression predictors

Variables included	B	Standard B error	Beta	t	sig.	RSquare	Fchange	sig. Fchange
MODEL 1: Age						0.174	8.006	0.007
Age	0.400	0.142	0.417	2.825	0.007			
MODEL 2: Age, irrationality						0.285	5.749	0.022
Age	0.079	0.033	0.342	2.402	0.021			
Irrationality	0.328	0.137	0.342	2.398	0.022			

B = unstandardized (B) regression coefficient, Standard B error = standard coefficient error (deviation standard in the distribution of the survey of the coefficient), Beta = standardized Beta regression coefficient, t = the statistic of the significance test of the coefficient, sig. = statistical significance, RSquare = coefficient of determination (the proportion of the variance in the dependent variable that is predictable from the independent variable), Fchange = change in the response variable for one unit of change in the predictor variable while holding other predictors in the model constant, sig. Fchange = statistical significance of Fchange

Table no. 3. Multiple step-by-step regression of dysfunctional distress predictors

Variables included	B	Standard B error	Beta	t	sig.	RSquare	Fchange	sig. Fchange
MODEL 1: Surgical condition severity						0.223	10.881	0.002
Severity	4.215	1.278	0.472	3.299	0.002			
MODEL 2: Surgical condition severity, age						0.365	8.314	0.007
Severity	2.321	1.342	0.260	1.730	0.092			
Age	0.216	0.075	0.433	2.883	0.007			
MODEL 3: Surgical condition severity, age, irrationality						0.439	4.717	0.037
Severity	2.192	1.280	0.245	1.711	0.096			
Age	0.189	.072	0.379	2.609	0.013			
Irrationality	0.577	.266	0.278	2.172	0.037			

B = unstandardized (B) regression coefficient, Standard B error = standard coefficient error (deviation standard in the distribution of the survey of the coefficient), Beta = standardized Beta regression coefficient, t = the statistic of the significance test of the coefficient, sig. = statistical significance, RSquare = coefficient of determination (the proportion of the variance in the dependent variable that is predictable from the independent variable), Fchange = change in the response variable for one unit of change in the predictor variable while holding other predictors in the model constant, sig. Fchange = statistical significance of Fchange

DISCUSSIONS

This study has aimed to investigate the extent to which some demographic (age), medical (surgical condition severity) and psychological (irrational beliefs and self-efficacy) variables can be significant predictors of anxiety, depression and dysfunctional negative emotions in surgical patients during their preoperative stage.

The results of this study show that age is the most important predictor for all the variables evaluated, explaining 13.6% of preoperative anxiety variance, 17.4% of preoperative depression variance and 14.2% of dysfunctional negative emotion variance. The next most significant predictor was global irrationality, which explains 11% of the preoperative anxiety variance and 11.1% of the preoperative depression variance, as well as 7.4% of the dysfunctional negative emotion variance. On the other hand, the severity of the surgical condition proved to be a significant predictor only for dysfunctional negative emotions, explaining most of their variance (22.3%). All these results are consistent with the results of the meta-analysis (15) showing that there is a moderate positive correlation between irrational beliefs and different types of distress: anxiety, depression. This may also explain the relatively moderate contribution of global irrational beliefs to preoperative distress. On the other hand, the same meta-analysis shows that variables such as age and medical condition severity have a significant contribution, moderating the relationship between irrational cognitions and emotional distress. In this study, age proved to be the variable with the strongest contribution to preoperative anxiety, depression and dysfunctional negative emotion variances. The fact that the severity of the surgical condition has had a significant contribution only to level of the dysfunctional negative emotions measured by means of the Emotional Distress Profile scale (EDP), and not to the level of anxiety and depression measured by the Hospital Anxiety and Depression Scale (HADS), may be explained by the fact that the former scale contains subclinical and clinical emotional items, unlike the HADS which contains only clinical emotional items.

Self-efficacy did not prove to have a significant contribution to any of the measured outcome variables which indicates that its level of importance in the preoperative period is low. Future studies should assess the contribution of self-efficacy in the postoperative period, when the patient has to adopt healthier behaviours and cope with postoperative obstacles.

Another issue worth considering is the descriptive data related to the predictor and outcome variables. These data show that only 10% of the women and 7.5% of the men enrolled in this trial experienced clinical anxiety symptoms and only 5% of the women and 2.5% of the men experienced clinical depressive

symptoms. Also, the average values of anxiety (M = 6.65, SD = 4.06) and depression (M = 4.23, SD = 3.34) were within normal limits. These findings are consistent with data reported by other studies, according to which depressive and anxious clinical symptoms are present in a relatively low percentage of surgical patients.(21) Likewise, the level of irrational cognitions was moderate, with the most influential cognition being the demandingness, a fact that contradicts the results of other studies, according to which awfulizing (catastrophizing) (12,13) and low frustration tolerance (15) cognitions play an important role.

All of these data may be explained by a number of factors that future studies should take into consideration: the difficulty of some of the surgical patients to tell how they feel and the beneficial effect of their contact with people going through a similar experience, who exhibit a relatively positive attitude towards their situation. Besides, the relatively small size of this study sample may be regarded as a limitation, which is why future studies should try to replicate its results on a more significant sample.

CONCLUSIONS

Global irrationality explains about 15% of anxiety, depression and dysfunctional preoperative distress variance, meaning that people with global negative attitudes and beliefs feel more vulnerable when they undergo surgery.

Age is the most revealing factor for the dysfunctional distress variance (23.5%) and then the depression and anxiety variance (about 10%). Therefore, old age is an intrinsic predictor of preoperative distress, anxiety and depression.

These data show that it is vital that health professionals become aware of the vulnerabilities of their surgical patients and design surgical interventions addressing such vulnerable age groups and decrease dysfunctional cognitions in surgical patients, which are adversely impacting on their mental and physical health.

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