Stress Reduction in Post Cardiac Surgery Family Members:

Implementation of a Post Cardiac Surgery Family Took Kit

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ABSTRACT

The intensive care unit (ICU) can be a place of stress, anxiety, and emotional instability for both patients and families. Medical and nursing care during this acute time is patient focused, and family members are often left in the dark. Unintentional exclusion from information results in high levels of stress, anxiety, and uncertainty for families. Due to the acuity of illness, family members of cardiac surgery patients experience the highest levels of stress. Spouses may experience intense psychosomatic symptoms: depression, anxiety, and fear, for several months after the surgery (Mahler & Kulik, 2002). The purpose of this study was aimed at decreasing those feelings of anxiety in post cardiac surgery family member through the use of a cardiac surgery toolkit. The study was a quality improvement project utilizing a convenience sample of 83 participants aged 18 and older. Participants were asked to use the State Trait Anxiety Inventory Form Y-1 (state anxiety) to rate their anxiety level pre intervention and then again post intervention. Data was collected over a 6month period. Descriptive data including age, education level, ethnicity, relationship, previous experience in the ICU, and active diagnoses of mental disorders did not affect the changes in the pre and post test data. A paired t-test was conducted on the sample to assess changes in state anxiety, using the STAI Form Y-1. The results were statistically significant, $t = 11.97$, $df = 81$, $p < 0.001$. Respondents' scores decreased significantly from pre- (M = 53.01, SD = 12.19) to post-intervention (M = 37.38, SD = 10.94). The data suggests that the use of a post cardiac surgery tool kit is a low risk measure that can decrease the anxiety in family members of post cardiac surgery patients.

Keywords: Anxiety, Cardiac Surgery, STAI, Intensive Care Unit (ICU)

BACKGROUND/SIGNIFICANCE

Family anxiety in post cardiac surgery patients is a real issue, and often results in long lasting effects even after the patient has been discharged from the hospital. Currently there is minimal research and expertise in this area, resulting in a lack of interventions or research to support changes in practice. Nurses are often the first to witness the effects the intensive care unit can have on families. Having minimal education or information before entering the ICU room makes it extremely difficult for families to understand critical information conveyed by the healthcare team. Family members may also be overwhelmed by the intensive care environment. Multiple research studies have identified major factors associated with family stress; however, interventions have not been proven effective in reducing these issues (Knapp, Sole, Byers, 2013). Uncontrolled family stress can place an immense burden on the patient during the healing period, and make caring for the patient more difficult for the health care team. Nurses report that families in the perioperative period often appear unprepared for the surgical experience and display feelings of frustration (Hamilton, Corlett, Dowling, 2014). The lack of preparation of these families only further increases their feelings of anxiety and stress. Researchers have found that 10-42% of relatives of ICU patients may exhibit symptoms of anxiety and 16-35% may exhibit signs of depression (Kulkarni et al, 2011). The purpose of this study was to implement a post cardiac surgery tool kit for family members. The aim of the tool kit was to decrease anxiety levels in family members of intensive care patients post cardiac surgery. The tool kit was developed by the researcher with a focus on reduction of stressors that have already been identified in previous research studies and those observed in the clinical environment. The main goal of this intervention was to provide family members with improved education and realistic expectations for the critical care experience and to reduce anxiety.

THEORETICAL FRAMEWORK

The framework used for this study was Lazarus and Folkman's Transactional Model of Stress and Coping. The theory defines "stress as a psychological reaction response and defines it as a relationship between a person and the environment that is considered taxing by the person and endangers well-being; coping consists of cognitive and behavioral efforts to manage stressors" (Lazarus & Folkman, 1984). Careful and purposeful intervention can prevent poor psychological reactions and enhance family understanding in an intense and unfamiliar environment. Keeping families in focus will decrease stress, and also provide a well-rounded provider-patient-family model. The theoretical framework involves three focus areas: primary appraisal (judgement a person makes about an event or stressor), secondary appraisal (judgement about how a person responds to an event), and reappraisal (appraisal after new or additional information has been received). This study utilized an intervention focused on the reappraisal area. The purpose was to understand if implementation of a post cardiac surgery tool kit for family members decreased anxiety and how a family member responds to the stressful event.

LITERATURE REVIEW

Education modules for family members can alleviate family and patient stress. Mahler and Kulik (2002) suggest informing family members about procedures, protocols, and equipment prior to their first intensive care visit. Early education can improve a family's reaction to the ICU environment and promote stress reduction. Nurses are among the first to recognize family distress and the associated psychological symptoms of anxiety, making them ideal advocates and educators for stress reduction programs (Davidson et al, 2010). Early intervention, often in the perioperative period will maximize beneficial outcomes.

Bedside nurses and researchers have defined family needs and stressors; however there is a gap in knowledge if a formal stress reducing model would help to alleviate these factors (Knapp, Sole, Byers, 2013). Few studies describe the design and implementation of successful interventions. Stefan (2012) utilized a mixed methods design when implementing a nurse liaison to communicate with families during the perioperative time. The researcher concluded 95% of families provided with a nurse liaison rated the surgical experience as "good". Families that did not receive a liaison rated their anxieties to be higher in the perioperative satisfaction survey. Chatzaki et al (2010) completed a prospective cohort study that implemented a daily education leaflet to ICU families. Information included frequently asked medical questions, terminology, and information regarding the ICU environment. Participants reported higher rates of satisfaction with the use of the leaflet; however the leaflet should be tailored to the educational and socioeconomic background of the families receiving it. Knapp, Sole and Byers (2013) developed an EPIC Family Care Bundle based on a control design with a convenience sample for post trauma patients, nonetheless no statistical significance was found in reducing stress. Theoretical frameworks such as Lazarus and Folkman's Transactional Model of Stress and Coping recognize the need for interventions in diminishing stress.

According to McAdam and Puntillo (2009), recent guidelines support family centered care in the ICU. Assessing emotional symptoms specifically, can immensely improve patient, family and provider satisfaction. McAdam and Puntillo (2009) also concluded that families not only suffer in the ICU but long afterward. Patients often have little recollection of their critical care experience; however families carry a heavy burden for an extended period of time. Mahler and Kulik (2012) utilized a quasi-experimental design and developed a family centered information videotape focused on the spouses of postoperative coronary artery bypass graft

(CAGB) patients. The intervention reduced emotional distress and spouses reported that they felt better prepared and less uncertain. It was unclear whether patient stress was reduced by the improved preparation of the spouses. Family focused care involves multiple variables, including language barriers, lifestyle and value differences, and understanding of technology and medical procedures (Lehna et al, 2011). All of these areas should be addressed and included in families' orientation to the ICU.

One of the difficulties in implementing a family based education model is inconsistent delivery (Knapp, Sole, Byers, 2013; Lehna et al, 2011). Nurses should be specially trained and educated on understanding family stress, and the delivery of the education program. According to Hamilton, Corlett, and Dowling (2014) communication and negotiation skills are extremely complex, making family centered care and education challenging to implement in practice. Thoughtful process planning and properly trained staff will lead to a highly successful family based education model and reduce negative outcomes associated with family stress.

Family stress in the intensive care unit can be detrimental. It affects all aspects of the health care team, including the patient and provider. It can leave physical and psychological scars on family members for months after their relatives critical care stay. Extensive research has defined the most common stressors for families in the ICU; however gaps in the literature remain in identifying successful stress reducing techniques. Health care providers, specifically nurses, recognize times of emotional distress, and are one of the best representatives to initiate stress reduction education. Perioperative education has been shown to be the most effective in reducing stress and anxiety. Specific focus should be given to post cardiac surgery families, as some research has concluded stress levels in these families remains the highest.

METHODOLOGY

Design

This quality improvement project evaluated whether the use a post cardiac surgery family tool kit decreased anxiety in family members using the STAI-Y1 form. Participants were asked to rate their anxiety using the STAI-Y1 form pre intervention and then again post intervention to determine differences in anxiety. Prior to the initiation of the study and data collection, the project was approved by Robert Morris University Institution Review Board (IRB). The project was also approved by the affiliated hospital's Quality Improvement Board. Informed consent was given to all participants prior to the collection of data.

Sample and Setting

This study was completed at a large tertiary care hospital located in Pittsburgh, Pennsylvania. The study was completed in the cardiothoracic intensive care unit- an 18 bed unit specializing in the post-operative care of cardiac surgery patients including coronary artery bypass grafting, valve replacements, and aortic aneurysm repair. Most recent statistics from January 2012 through June 2013 report 3,394 total cardiac procedures at this facility (UPMC Heart and Vascular Institute, 2013).

The study consisted of 83 participants, part of a convenience sample based on family members of cardiac surgery patients having surgery during the designated time period. All family members of elective surgeries were eligible for the study. Exclusions included emergent cases and direct admissions to the ICU. A number of demographic variables were assessed prior to the intervention including, age, gender, ethnicity, education level, relationship to the patient, previous exposure to the ICU, and past history of mental illness or memory problems. Age of

participants ranged from 18-87. Forty-five percent of the participants were male and 55% were

female. Full information of descriptive statistics is shown in table 1.

Table 1

Demographic variables for participants (N=83)

Ethnicity of Participant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White	74	89.2	89.2	89.2
	Hispanic or Latino	1	1.2	1.2	90.4
	Black or African American	7	8.4	8.4	98.8
	Asian or Pacific Islander	1	1.2	1.2	100.0
	Total	83	100.0	100.0	

Education of Participant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Some high school, no degree	9	10.8	10.8	10.8
	High school graduate	22	26.5	26.5	37.3
	Some college, no degree	7	8.4	8.4	45.8
	Associate	18	21.7	21.7	67.5
	Bachelors	15	18.1	18.1	85.5
	Masters	9	10.8	10.8	96.4

	Doctorate	3	3.6	3.6	100.0
	Total	83	100.0	100.0	

Relationship to Patient

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Spouse	33	39.8	39.8	39.8
	Significant other	5	6.0	6.0	45.8
	Parent	7	8.4	8.4	54.2
	Sibling	10	12.0	12.0	66.3
	Child	28	33.7	33.7	100.0
	Total	83	100.0	100.0	

ICU Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	58	69.9	69.9	69.9
	No	25	30.1	30.1	100.0
	Total	83	100.0	100.0	

Procedure

Family members, who were deemed appropriate to participate in the study, were given informed consent. All questions regarding informed consent were answered by the researcher. The participants were then asked to complete a demographic questionnaire and the STAI Form Y-1 rating their anxiety. After completing the pre intervention items, the patients were given the

Post Cardiac Surgery Tool-Kit. The tool kit consisted of usual expectations for family members the day of surgery, where they would speak with the doctor, the estimated length of time of the procedure, and where to receive operative updates. In addition definitions of common medical devices used the intensive care unit were provided, such as mechanical ventilation, arterial lines, chest tubes, and pacemakers. Further explanation was also provided on post op surgery protocols, and intensive care expectations and rules for visitation. This information was received in the form of a brochure for the family to keep with direct review with the researcher. After reviewing the brochure, participants were then given a brief five minute tour of the intensive care unit, where to find the waiting room and how to call into the unit. After the intervention, participants were then asked to use the STAI Form Y-1 to rate their anxiety.

Measures

The State Trait Anxiety Inventory is a widely used psychological tool to measure general anxiety in a variety of different settings (Julian, 2011). Form Y-1 is a 20 item survey specifically correlating to anxiety in present time. Items such as "I feel Calm, I feel Worried" are rated on a 4-point scale from "Almost Never to Almost Always". Higher scores on the survey indicate higher levels of anxiety, scoring is reversed for the anxiety absent items. The survey is approved for those individuals with at least a sixth grade reading level. This survey was obtained via Mind Garden with license to reproduce.

Ten items from the 20-item STAI Form Y-1 (state anxiety) were appropriately reverse coded and both pre- and post-intervention results were entered into IBM SPSS Statistics 22.0. Cronbach's Alpha was computed for both the pre- and post-tests to assess internal reliability. The reliability statistics indicate desirable internal consistency (pre-test Alpha = .930, n = 83, k =

20; post-test Alpha = 0.938, n = 82, k = 20). Alpha values greater than 0.70 are generally

considered acceptable.[1]

Data Analysis

Descriptive statistics were used to examine the demographic data to determine if those

variables impacted the overall level of anxiety. Next, a paired *t*-test was conducted on the sample

to assess changes in state anxiety, using the STAI Form Y-1.

RESULTS

The study included a total of 83 participants. All 83 of those participants completed the

pre and posttest STAI Form Y-1. A paired *t*-test was conducted on the sample to assess changes

in state anxiety, using the STAI Form Y-1. The results were statistically significant, $t = 11.97$, *df*

$= 81$, $p < 0.001$. Respondents' scores decreased significantly from pre- (M = 53.01, SD = 12.19)

to post-intervention (M = 37.38, SD = 10.94). Tables 2 and 3 provide the descriptives and test,

respectively. Scores on the STAI Form Y-1 can range from 20 to 80. Thus, the 15 point change

is also practically significant, as it represents one-fourth of the scale range.

Table 2: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest score	53.0122	82	12.18630	1.34575
	Posttest score	37.7805	82	10.93756	1.20785

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[1] Nunnally J, Bernstein L. Psychometric theory. New
York: McGraw-Hill Higher, INC; 1994.

Table 3: Paired Samples Test

	Paired Differences					Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	t	df	
Pair 1 Pretest score - Posttest score	15.23171	11.52378	1.27259	11.969	81	.000

A difference score was created by subtracting post-intervention STAI scores from pre-intervention STAI scores. The difference score was evaluated for normality. Both the Komogorov-Smirnov and Shaprio-Wilk test support normality, $p > 0.10$. See Table 4.

Table 4: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
STAI difference	.076	82	.200[*]	.980	82	.235

[*]. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

A number of demographic variables were considered as potential sources of variation in changes in anxiety: age, gender, ethnicity, education, ICU experience, and relationship to patient. A

series of independent *t*-tests and one-way ANOVAs was conducted, using the demographic

variables as factors, and the STAI difference score as the outcome. No significant differences

emerged. Thus, the positive change in anxiety is not related to demographic characteristics.

Improvement in anxiety, related to the intervention tool kit, does not discriminate with respect to

individual difference variables.

LIMITATIONS

There were several limitations to this quality improvement project assessing family

anxiety in post cardiac surgery patients. First and foremost this is an extremely stressful time for

all family members involved. The process of waiting to hear the outcome of a loved one's

surgery can be scary, intense, and stressful. Often times it may take 4-6 hours for any update on

the patient's condition. Approaching family members in an already stressful and anxiety

provoking environment can feel intrusive. This made data collection difficult. Some family

members had difficulty understanding the study due to the high level of stress they were already

experiencing. Family members feeling this way often did not want to participate in the study, or

began the survey and half way through revoked their consent.

A second limitation to this study involved the tour of the cardiac ICU. Depending upon

what was occurring in the unit at the time, may have had an effect on how participants rated their

post anxiety. If the unit appeared busy with more critical patients, this may have increased scores

of anxiety after the tour.

Another limitation to the project may have been the delivery. The results were collected

primarily by the lead researcher. This could have resulted in some bias or change in results

depending upon the delivery of the information in the cardiac surgery tool kit, and how the tour

was given. Efforts were made to have the same delivery amongst all participants, however this cannot be calculated for.

Lastly, a past medical history of anxiety was not addressed in the sample. It is possible that those with an active diagnosis of anxiety as well as with medication or without medication may have made a difference in results. It is also possible those family members that may have been in an intensive care unit as a patient and depending on their experience may have higher anxiety levels if their experience was poor. However the intention of this study was to discern if anxiety was reduced after the intervention, regardless of preexisting anxiety.

IMPLICATIONS FOR PRACTICE

Literature suggests family anxiety can be detrimental to both the patient and family during the initial post-operative period and years after surgery. The cardiac surgery tool kit has proven to be a low risk measure in reducing anxiety in family members post cardiac surgery. Anxiety inhibits the brain from taking in new information and can create a barrier with the healthcare team. Utilizing anxiety reduction techniques can improve family anxiety and offer multiple benefits including improved patient healing, improved communication with the health care team, and improved understanding of post-operative care.

This quality improvement study noted statistically significant changes in pre and posttest data following the implementation of the cardiac surgery tool kit. Further research would be needed to determine if this study can be applied across other populations ie: neurosurgery, trauma, palliative treatments. Anxiety is often difficult to assess and assessment can vary widely across populations. Careful considerations need to be made when creating a study design and education material for participants.

Also considerations regarding the limitations should be discussed. Further research is needed within this same sample to determine the overall benefits of a cardiac surgery tool kit to reduce family anxiety. The use of a nurse liaison specially trained on the tool kit may be beneficial to keep delivery consistent. It may also be interesting to determine whether the education packet or the unit tour had more of an impact on participant's anxiety ratings.

Overall, this quality improvement project suggests that there is a strong benefit with minimal risk to implementing a cardiac surgery tool kit for families in this environment and setting. Further research can help identify if this would be beneficial across various populations. More information is also still needed to address those family members that are direct admissions and emergent cases.

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To whom it may concern,

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Instrument: *State-Trait Anxiety Inventory for Adults*

Authors: *Charles D. Spielberger, in collaboration with R.L. Gorsuch, G.A. Jacobs, R. Lushene, and P.R. Vagg*

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SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1
Please provide the following information:

Name_____Date_____S_____

Age_____   Gender (*Circle*) **M**   **F**   T_____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below.
Read each statement and then circle the appropriate number to the right of the statement
to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong
answers. Do not spend too much time on any one statement but give the answer which
seems to describe your present feelings best.

NOT AT ALL   SOMEWHAT   MODERATELY SO   VERY MUCH SO

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4