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Pre and post operative care for cardiac catheterization, stress management: A study protocol

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Abstract--Background: Heart disease has been increasingly common in recent years, and cardiac care overall, including cardiac catheterization, has increased accordingly. Heart catheterization is a difficult surgery for both patients and practitioners. It's important to recognise that there are a number of potential sources of stress, both mental and physical, while doing the operation. The study's overarching goal is to design and pilot a stress management approach aimed at decreasing the Heart catheterization causes emotional and physical distress. Methods: The clinical trial used a double-blind, randomized, controlled design. randomised controlled trials of interventions for individuals undergoing planned cardiac catheterization. With doctors and nurses working in the cath lab, Interventions were not the same for both groups, as a means of handling stress. As part of the treatment, patients will participate in a psychoeducational movie demonstrating a variety of techniques for dealing with stress, plus an established health and safety details regarding a heart catheterization evaluation. The status quo consists of the routine medical examination (usual) in hospitals was preceded by patient education care). A variety of physiological indicators are

used to assess both primary and secondary effects. and reliable questionnaires taken on the day before (M1) and after (M2) the cardiac post-catheterization mail-in follow-up 6 months later (M3). It's to be expected reduced complications are seen in those who have been exposed to standardised information and psychoeducation. Improved health before and after cardiac catheterization procedures, rejuvenation, improved disposition, and reduced stress levels. This is the practitioner intervention. includes a Mindfulness-based stress reduction programme (MBSR) over 8 weeks supervised by an experienced MBSR practitioner directly at the clinic site and an operative guideline. It is expected that practitioners with intervention show improved perceived and chronic stress, occupational health, physical and mental function, higher effort-reward balance, regeneration and quality of life. Primary and secondary outcomes are measured by physiological parameters (heart rate variability, saliva cortisol) and validated questionnaires and will be assessed before (M1) and after (M2) the MBSR intervention and at a postal follow-up 6 months later (M3) (M3). Physiological biomarkers in practitioners will be assessed before (M1) and after intervention (M2) on two work days and a two days off. Intervention effects in both groups (practitioners and patients) will be evaluated separately using multivariate variance analysis. Discussion: This study assesses the effectiveness of two stress management intervention programmes for patients and practitioners within cardiac catheter laboratory. Study will expose strains during a cardiac catheterization impacting both patients and practitioners. For practitioners it may contribute to improved working circumstances besides ensuring a safe workplace, maintaining one's ability to earn a living, and staying out of trouble, restrictions and loss of performance. Less worry, stress, and It's possible that there will be problems before and during the actual procedures. As the research progresses, it's possible that boost understanding of how to remove potential sources of stress and increase your ability to have a positive impact safety (mentally), decreased output losses, and less work-related fatigue. Over time, the developed the standardised patient education, stress management guidelines, and training materials be implemented into standard clinical practise.

Keywords--standardized patients, stress, mindfulness-based stress reduction, psychoeducation are some of the terms used to describe the methods used to manage, reduce stress, heart catheterization, study methodology, stress intervention, information (CC).

Introduction

Cardiac catheterization

Radiopaque arterial and venous catheters are inserted into specific right and left coronary artery and vein locations during a cardiac catheterization, an invasive diagnostic procedure. With the help of fluoroscopy, the catheter can be advanced

with precision. Catheters are usually put percutaneously into the blood vessels, though a cutdown technique may be used if the patient has inadequate vascular access. Oxygen levels and pressures in each of the heart's four chambers are recorded. Heart catheterization is performed to diagnose coronary artery disease, evaluate coronary artery patency, and calculate the proportion of coronary artery obstruction caused by atherosclerosis. These findings indicate whether revascularization operations, such as PTCA or coronary artery bypass surgery, would be beneficial to the patient. During a cardiac catheterization, the patient is given sedatives, fluids, heparin, and other drugs through an intravenous line. Maintaining constant vigil for dysrhythmias or hemodynamic instability necessitates noninvasive hemodynamic monitoring, which entails BP and numerous ECG tracings.

Dysrhythmias may occur if the myocardium becomes ischemic while catheters are being positioned in the coronary arteries or contrast chemicals are being injected. During the operation, resuscitation supplies must be easily accessible in case of emergency. Staff members should be trained to administer advanced cardiac life support if needed. The coronary arteries can be seen on an x-ray using radiopaque contrast chemicals, some of which contain iodine. Prior to the treatment, the patient is tested for known sensitivities to iodine and responses to contrast chemicals (eg, seafood). Antihistamines or methylprednisolone (Solu-Medrol) may be given to the patient before the surgery if an allergy to the drug is suspected or confirmed. Blood urea nitrogen (BUN) and creatinine levels, prothrombin time (PT), partial thromboplastin time (PTT), hematocrit, haemoglobin, platelet count, and electrolyte levels are all measured to detect anomalies that may slow recovery. In most cases, diagnostic cardiac catheterizations can be conducted as an outpatient procedure, though patients should expect to rest for anywhere from two to six hours after the procedure before being able to walk around.

There is no difference in the risk of complications from groin bleeding between a 2-hour bed rest and a 6-hour bed rest. Variations in time to ambulation may be caused by a number of factors, including but not limited to the size of the catheter used, the patient's anticoagulation status, other patient variables (such as advanced age, obesity, bleeding disorder), the method used for hemostasis of the arterial puncture site after the procedure, and institutional policies. In diagnostic cardiac catheterizations, it is usual practise to utilise smaller catheters (4 or 6 Fr) that allow for faster healing. Arterial hemostasis can be achieved after removing a catheter using a variety of means, such as human pressure, mechanical compression, and vacuum suction (placed over puncture site for 30 minutes). Patients admitted to the hospital with angina or a heart attack may Cardiac catheterization may also be necessary for patients hospitalised for angina or acute MI. In most cases, these patients will return to their rooms in the hospital for recovery after the treatment has been completed. In some hospitals that do cardiac catheterizations, angioplasty can be done right after the procedure if needed.

Catheterization-following patient education The following are recommendations for self-care following a cardiac catheterization release from the hospital: For the next twenty-four hours, avoid stooping over or lifting anything heavier than a

paperback. It is recommended to avoid taking baths and instead take as many showers as you like.

Patient education after catheterization

Talk to your doctor about when you may drive again, go back to work, or start doing rigorous activities again. Blood loss, increased size of the puncture site, new bruises or pain, a temperature of 101.5 degrees Fahrenheit (38.6 degrees Celsius), or higher should all prompt a phone call to your doctor.

- Discuss treatment alternatives, such as cardiac rehabilitation programmes, with your doctor if tests reveal coronary artery disease.
- Consult with your doctor and nurse about making changes to your lifestyle that can minimise your chance of developing heart problems in the future. These might include giving up smoking, modifying your diet and starting an exercise routine or reducing weight.

Preoperative Medication Withdrawal: Stop taking warfarin (Coumadin) 5 days before surgery. When it is time to end, we will let you know. If your doctor has prescribed Pradaxa (Dabigatran), you should stop taking it as soon as possible (often within 2 days). If your doctor has prescribed Xarelto (rivaroxaban), you should stop taking it as soon as possible (often within 2 days). Your doctor will tell you when to stop taking Elliquis (Apixiban), however it's often only for 2 days. You should stop taking metformin 2 days before your surgery and after it. If your doctor has prescribed Aggrenox (a combination of aspirin and dipyridamole), you must discontinue use of the drug. standard dosage is twice daily. Following the procedure, you will be given instructions on when to resume taking these drugs. If your cardiologist believes that you would benefit from taking PLAVIX (Clopidigrel), he or she may offer you a trial supply. Hence, follow the instructions the day before your surgery.

Operation Day

Breakfast is permitted. • Continue taking your meds as prescribed unless otherwise indicated. Don't forget to bring a list of all the supplements and prescription drugs you take with you to the hospital. Take your medical ID with you. Patients with diabetes should follow their doctor's orders when administering insulin and other diabetic medications. Specialist in cardiac care on the day of surgery. (Metformin is an exception; avoid it if possible) Please check in at the King's College Hospital (KGH) patient registration desk. The surgery could take between thirty minutes and an hour. You'll need between one and four hours to rest and recover after the operation. The Cardiac Procedures Unit has a waiting space for your loved ones. After the procedure, your doctor will go through the findings with you and give you and your loved ones any relevant information they need to know. It is recommended that you spend the day in the hospital, as unexpected events may cause delays.

Following the Operation

You will either be taken back to one of our post-op care centres where you can recover before being released, or Potential hospitalisation for observational purposes. If you are discharged and live more than 60 minutes from the hospital, you are required to have a responsible adult accompany you home. Be sure to book a hotel for the night before your surgery in Kingston. You can get a list of hotels in the area from us. Motels; and the like. You should not operate a motor vehicle for at least 48 hours following surgery. Procedure nights are not ones in which one should be left alone. I implore you to make lodging arrangements for You, in the event of unforeseen difficulties. Apply pressure to the area if bleeding occurs during the process. Put a halt to the bleeding. Please inform the staff if you experience any unexpected pain or swelling at the site of the surgery. Call a nurse right away, or if you're at home, head back to the emergency room. The cardiac catheterization procedure may have one of four possible outcomes:

1 - Heart Arteries Are Typical A release from service is in order for you. Please schedule a follow-up appointment with your primary care physician. Second, Medical Care Your doctor may prescribe medicine and suggest behavioural modifications to improve your health. Three-Coronary angioplasty with or without stenting. After getting a stent put in, you can be sent home, or you might be sent to a post-acute care facility. staying the night in the surgical/procedure/diagnosis/treatment/etc. If you are hospitalised, you must arrange for a ride home by 10:00 a.m. the following morning. am. The out-of-town relatives can be given a selection of hotels to choose from. Plavix (Clopidogrel) or Ticagrelor will be prescribed if a stent is inserted (Brilinta) You should take this medication exactly as prescribed.

Open-Heart Surgery: It will be determined how quickly you need to be seen and whether you will be admitted to KGH, sent home, or sent back to your waiting for surgery in a local hospital. You or the hospital will hear from your cardiac care coordinator. providing employees with directions. Resuming Your Medication Schedule After Surgery Take your regular dose of warfarin (Coumadin) the evening before your surgery. Take Metformin for the regular duration or as prescribed by your doctor beginning 2 days after the surgery.

Take the prescribed dosage of Pradaxa (Dabigatran). Take Xarelto (Rivaroxaban) as prescribed by your medical professional. Taking Eliquis (Apixaban) as prescribed by your medical professional. Take your regular dose of Aggrenox (Aspirin and Dipyridamole) the night before your procedure. Patients at high risk of an anaphylactoid reaction to contrast media should be premedicated before receiving the treatment. The foundation of most premedication regimens for patients at high risk for an anaphylactoid reaction to contrast media are corticosteroids and histaminic receptor 1 antagonists (H1 blockers). Prednisone 50 mg p.o. on days 13, 7, and 1 in addition to diphenhydramine 50 mg p.o. on the day of the procedure is recommended. This is useful for lowering the risk of future anaphylactoid reactions to common contrast agents [4]. Benzodiazepines [diazepam (5 mg) or midazolam (1 mg)] or diphenhydramine (25 mg) are commonly administered intravenously prior to procedures to induce a state of conscious sedation in patients [5]. Sedation, on the other hand, may be preferable

if the patient is extremely worried or disturbed. Opioid medication morphine (2 milligrammes) can also be given. It is possible to reverse a benzodiazepine overdose with a drug called flumazenil, which is a pure benzodiazepine antagonist (dosage 0.2 mg IV over 15-30 sec). It reverses the effects of benzodiazepines, although its effects wear off more quickly. In this case, more dosages might be administered at 60-second intervals. The most critical issue in cases of morphine use is respiratory depression, which may necessitate reversal of sedation. The opioid receptor antagonist naloxone (0.001 mg/kg IV) is used to reverse the effects of narcotic analgesics (morphine).

Topical numbing agents A successful catheterization cannot be performed without sufficient local anaesthetic. Poor patient cooperation is a direct result of inadequate anaesthetic, which also negatively impacts the Cath Lab experience for everyone involved. Lidocaine 1% or 2% (fl 10 ml) is the most often used local anaesthetic in the Cath Lab, with a dosage of 10 ml to get femoral access and 2 ml for radial/ulnar access. Some laboratories use a mixture of lidocaine and sodium bicarbonate (2 ml lidocaine and 1 ml NaHCO₃) to alleviate the painful reactions that often occur during radial access. Lidocaine allergies affect fewer than 1 in every 100 people. For this purpose, mepivacaine 1% and bupivacaine 0.25 % solutions are recommended.

Radial Arterial Optimisation Agents A multitude of events may cause arterial spasm during radial artery puncture or operations. Calcium channel blockers (e.g., Verapamil 2.5 mg) and/or nitrates (e.g., Nitroglycerin 0.1-0.4 mg) are commonly used as prophylactic medications to reduce radial vascular tone and are best administered directly in the radial artery soon after vascular access. Typical components of a radial cocktail include 200 mcg of nitrate, 1 ml of 1% lidocaine, 1 ml of bicarbonate, and 2 mg of Verapamil (0.8 ml of a 5 mg in 2 ml mixture). The spasmolytic cocktail can be made less painful by adding blood or salt water to it [6]. In individuals with a high risk of hypotension after spasmolytic cocktail treatment, such as those with severe aortic stenosis, extra caution should be exercised. Symptomatic spasm has been linked to a lack of pretreatment in as many as 30% of patients [7], although there is no solid evidence supporting superiority of any one pharmacologic regimen. It is common practise to administer unfractionated heparin (UFH) at a dose of 2500–5000 IU (dose, time, and route of administration at operator's discretion) even during diagnostic procedures to prevent radial occlusion.

Vasodilators of the coronary arteries (Nitrates) Nitric oxide (NO) donor nitroglycerin dilates both normal and stenotic blood arteries, making it useful for treating coronary artery disease. Before beginning cine acquisition in coronary angiography, nitrate (100-250 mcg) should be injected intracoronarily (IC) [8]. Dosages between 10 and 50 mcg are related with selective coronary vasodilation; 100 to 200 mcg cause mild systemic hypotension; and doses greater than 250 mcg increase the risk of hypotension without coronary flow enhancement. Notably, IC nitroglycerin treatment has been linked to a diagnosis of spontaneous coronary artery spasm, wherein obstructive stenosis is relieved.

Cholesterol-lowering drugs that constrict blood vessels in the heart Coronary reactivity and coronary artery spasm are often difficult to diagnose without using

provocative tests with the use of coronary vasoconstrictors [9]. Agents like ergonovine and acetylcholine are frequently employed in provocative experiments. Activation of serotonergic (5-HT₂) receptors in smooth muscle is the primary mechanism by which intravenously administered (1, 5 to 10 g) ergonovine causes vasoconstriction. In the present time, the only ergonovine available in the US is methylegonovine. Angina, ischemia, MI, arrhythmia, nausea, an allergic reaction, and ergotism are all possible side effects of ergot alkaloids. When administered intramuscularly (IC), doses of 10 to 100 g of acetylcholine stimulate muscarinic receptors in endothelium and smooth muscle. Vasodilation occurs when acetylcholine is activated in normal endothelium. However, acetylcholine promotes vessel contraction rather than vasodilation in the presence of endothelial dysfunction. To name a few, acetylcholine can cause hypotension, bradycardia, dyspnea, and flushing in those who are sensitive to it. Atropine can prevent the narrowing of the coronary arteries caused by acetylcholine.

Methods and Analysis

Study Design

Two interventions were tested in a before-and-after design. randomised controlled studies, in individuals with elective cardiac catheterization and doctors that work in the cath lab, in each case. Research on the individual patient Using individual blinding and the gold standard therapy There are three parameters for the control group: before yesterday Day of Admission (M1) and Day Following Video-Based Instruction cardiac catheterization and stress management exam (M2 = Day of CC Exam) and again 6 months afterwards baseline (M3) (M3). Practicioners' guide to the MBSR intervention a no-treatment control group in a one-to-one randomised study at the CC lab A randomised, double-blind, controlled trial with three time points: (M1) and after an 8-week mindfulness-based (M3) intervention. six months after starting the stress-reduction programme and baseline (M3). The numbers There will be a two-year collection window, beginning in July 2020 and ending on July 12, 2022.

Participants

Patients with an anticipated age range of 30–75 years old people who agreed to undergo a cardiac catheterization as part of a research project. The CC test should fulfil the following requirements: choice-based and not an emergency situation. Furthermore, appointments are reserved for just patients. For cardiac catheterization, all necessary components are provided. The following conditions warranted elimination: causes for not filling out a survey include pregnancy and mental health issues. a medical emergency It's just medical professionals, like doctors and nurses, Catheterization lab duties are a part of the treatment. trail. Practitioners are disqualified if they exhibit the following conditions: as a result of metabolic endocrinological illness. Everyone involved to give written or verbal approval after obtaining information that has been thoroughly explained information.

Sample Size Determination

The sample size for each of two patient groups was determined. scale based on preliminary research. When we took the sample, adequate for the assumed medium effect size ($d = 0.25$) and power level Clinical significance threshold of 0.5 standard deviation according to the primary (z-standardized) criterion, which was how stressed the subject was. To the criteria, the power to detect group differences is $1 - \beta = 0.93$, with $N = 40$ individuals sampled from each group.

Statistical Analysis

SPSS will be used for all statistical testing. The numbers of the professionals will mostly be described and critiqued because of the limited size of the sample. To do this, we shall employ an interferometric statistical method. the purpose of which is to spot distinctions across groups. Statistical a two-tailed p value of 0.05 is considered statistically significant, and effect sizes make a report of it.

Results

Reduced complications and decreased use of sedatives during CC (as documented by nurses in the CC lab) and decreased tension/strain (as measured by physiological parameters like pulse, blood pressure, and heart frequency) as well as decreased perceived stress (PSS) and improved mood (POMS) are the primary outcomes for patients. Additional Tertiary Effect benefits for patients include reduced levels of stress, despair, anxiety, and panic prior to and after surgery. contentment with life, health, and sleep; disorder (PHQ-9), psychosocial functioning (ILE), life events (SF-12), and general health (SF-12) Patients are also polled on their lifestyle, socioeconomic standing, and level of contentment with the intervention. In the cardiac catheterization laboratory (CC lab), nurses keep track of patient reactions to the procedure (e.g., level of agitation, length of hospital stay). in-hospital stay, sedative/tranquillizer use, and patient knowledge) and the number of problems that arose during the treatment. Practitioners' major outcomes, perceived (PSS) and chronic stress (TICS), are measured using well-established and validated self-report questionnaires. Physiological measures are also used to evaluate the stressor and the subsequent recovery: rhythmic daily routines HRV (42-44), saliva cortisol, alpha-amylase, and lysozyme levels were measured before and after the intervention on two work/lab days, two days off, and the next night.

The R-R intervals between heartbeats are used to calculate HRV, which includes results for autonomic nervous system activity as a whole (measured by the standard deviation of RR intervals, or SDNN), parasympathetic function (measured by the root mean squared distance, or RMSSD), and stress load and recovery (measured by the number and percentage of R-R intervals lower or >50 msec). On a workday/lab day and a day off, saliva samples are collected at the beginning of the day, at 30, 45, 90, and 150 minutes after waking up, before lunch, at 4 p.m., before dinner, and before going to bed. Both physical health and mental state are evaluated at the same time using the Profile of Mood States (POMS) questionnaire. Vital exhaustion (VE), anxiety and depression (HADS), tension, effort-reward imbalances (ERI), social support (BSSS), contentment with

health and sleep, and lifestyle, socioeconomic status, expectations and adherence (barriers) are also assessed by the practitioners. programme of preventative measures. Information on results, surveys, and benchmarks is supplied

TABLE 1 | Outcome measurements for patients with elective cardiac catheterization.

Outcome	Measurement	Assessment		
		M1 (day before CC)	M2 (day after CC)	M3 (6 months after M1)
Chronic stress	Trier inventory for chronic stress (TICS) (47)	X		X
Perceived stress	Perceived stress scale--10 items (PSS-10) (48, 49)	X		X
Life events	Inventory of stressful life-events (LE) (50)		X	
Depression	Patient health questionnaire--9 items (PHQ-9) (51)	X		X
Anxiety and depression	Hospital anxiety and depression scale (HADS) (52, 53)	X	X	
Health-related quality of life	Short form health--12 items (SF-12) (54)	X		X
Pain	Visual analog scale (VAS)	X	X	X
Mood	Profile of mood state (POMS) (55, 56)	X	X	
Satisfaction with health and sleep	Visual analog scale (VAS)	X	X	X
Life style factors	Physical activity, smoking, alcohol consumption, medication, critical life events	X		X
Sociodemographic characteristics	Sex, Age, education, marital status, job position, income	X		
Satisfaction with intervention			X	
Behavior while CC*				
Physiological parameter while CC*	Pulse, blood pressure, heart frequency	X	X	

*additional measurement during CC.

TABLE 2 | Outcome measurements for practitioners at the catheterization lab.

Outcome	Measurement	Assessment		
		M1 (before intervention)	M2 (after intervention)	M3 (6 months after M1)
Chronic stress	Trier inventory for chronic stress (TICS) (47)	X		X
Perceived stress	Perceived stress scale--10 items (PSS-10) (48, 49)	X		X
Effort-reward imbalances	Effort-reward imbalances questionnaire (ER) (57)	X		X
Anxiety and depression	Hospital anxiety and depression scale (HADS) (52, 53)	X	X	
Vital exhaustion	Maastricht vital exhaustion questionnaire (VE) (58)	X	X	
Tension	Visual analog scale (VAS)	X	X	X
Mood	Profile of mood state (POMS) (55, 56)	X	X	
Satisfaction with health and sleep	Visual analog scale (41)	X	X	X
Life style factors	Physical activity, smoking, alcohol consumption, medication, critical life events	X		X
Social support	Berlin social support scale (BSSS) (59)		X	
Sociodemographic characteristics	Sex, age, education, marital status, job position, income	X		
Expectation of/satisfaction with intervention		X	X	
Heart rate variability	Activity of the autonomic nervous system (SDNN), parasympathetic function (RMSSD)	X	X	
Stress profile	Cortisol, alpha-amylase (saliva samples) on nine defined time points during the day (two lab days and two days off)	X	X	
Weight	Scale	X	X	

Table 3
Distribution of sample according age (N=40)

Variables	Frequency	Percent
40-50	11	31.0 %
50-60	19	38%
60-75	15	22%
above75	5	10%
Total	40	100%

Table 4
Distribution of sample according to sex (N=40)

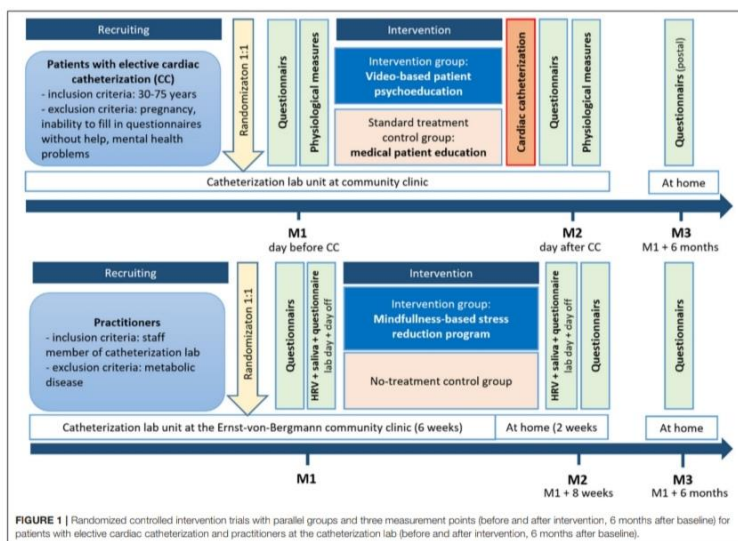
Variables	Frequency	Percent
Male	19	47.5%
Female	21	52.5%
Total	40	100%

Table 5
Types of cardiac catheterization (N=40)

Variables	Frequency	Percent
Diagnostic cardiac catheterization	4	10%
Diagnostic and therapeutic cardiac catheterization	36	90%
Percutaneous coronary intervention	0	0%
B-Therapeutic cardiac catheterization	0	0%
Total	40	100%

Table 6
Distribution of anesthesia for adult cardiac catheterization (N=40)

Variables	Frequency	Percent
General anesthesia	9	22.5%
Local anesthesia	30	75%
Sedation	1	2.5%
Spinal anesthesia	0	0%
Total	40	100%



Discussion

This protocol describes a randomised controlled trial that will examine the efficacy of stress management techniques, procedures and those who have to have emergency cardiac catheterization, as well as the professionals who perform catheterization lab. The patient intervention is a video-based Cardiac catheterization data in a standardised format Examining the Patient, and Providing Psychological Education Regarding Stress stress through methods such as deep breathing exercises, meditation, and practises like guided imagery, distraction, and reframing have been shown to be effective in helping people deal with stress. At the time of admission, the intervention video is shown. catheterization of the heart. This is the practitioner intervention. comprises 8 weeks of Mindfulness-Based Stress Reduction (MBSR) routine that includes breathing exercises, meditation, Hatha yoga, and At the clinic, do breathing exercises for 90 minutes a week and In the comfort of one's own home. Additionally, operative guidelines for mindful and Catheterization-related acts of self-awareness and precautions have been developed in case of complications or side effects and demonstrated in the laboratory Generally accepted and validated instruments and questionnaires are implemented to measure the effect of the action.

Although cardiac catheterizations are one of the most frequently used standard diagnostic methods in invasive Few research have analysed the effects of stress on cardiology. Catheterization management interventions for medical professionals relatively few methodologically sound and up-to-date laboratories research analysing video-based behavioural modification techniques (9). Considering the extent of the burnout in which case it would be safe to assume that the trend driven by the needs of the system and the inefficiencies of the Healthcare Delivery System (11), Catheterization Specialists It would appear that lab workers are more likely to suffer from the effects of chronic stress than the general population. results on one's health, including disruptions in one's sleep disorders, major depressive disorder, cardiovascular disease, obesity, Type-2 diabetes (12). This motivated us to develop a simple yet efficient method for create a stress-reduction plan that doctors and nurses can follow at cardiac catheterization centres and patients undergoing catheterization. harmful effects on the health of experts and the hazards to patients' safety that may optimally ameliorated by stress-management therapies like the Mindfulness-based stress reduction programme (MBSR). Evidence from controlled trials shows that MSBR regimens are effective minimise the negative effects of stress, anxiety, and depression (15)depression relapse rate, chronic pain, and general the state of one's health and their interpersonal connections.

Considered a member of the "easy learner" category curriculum with an emphasis on bodily awareness, meditation, and mindfulness-based techniques like body scanning and yoga poselow-threshold intervention such as a stress reduction programme would be easy to put into practise right away in the medical centre. In MBSR, simple to use and implement into existing procedures, this software equipment that can be used in several places or moved around easily similar like being at one's own house. Problems with following the treatment plan are a potential threat to the findings of the study. It's time for the intervention includes

a 6-week supervised Mindfulness-Based Stress Reduction (MBSR) course as part of a two-part curriculum. module conducted on-site at the clinic, followed by a participant-led Using an audiobook and a two-week at-home intervention, tutoring and a workbook. Evaluation of Adherence Issues by having participants answer free-form questions in all subsequent research. questionnaires. Information gathered here will be used for the sole purpose of locating a possibility of a change in adherence, and the typical hurdles that need to be addressed in transfer recommendations for practise and Normal procedure in a hospital setting.

In regards to Catheterization Patients the evidence is there that standardized, video-based patient preparatory reading material and stress-reduction techniques beneficial effects on non-invasive operational examinations Anxiety, stress, wellness, and postoperative treatment of pain Understanding the preoperative process and strategies for managing perioperative stress have been shown to boost confidence in one's ability to successfully complete the surgical procedure. manageability and test taker happiness on the CC Nevertheless, there are meta-analysis and intervention studies that revealed how pre-surgical expectations of patients affect post-examination outcomes like length of stay, post-surgical complications and recovery Negative expectations and previous experiences may trigger potential nocebo-related effects and could have an effect on pain perception and perceived stress . Our stress-management intervention for patients addresses expectations toward the CC examination and give instructions to get awareness of negative expectations and promote positive expectation. As we do not assess expectations in our control group this could still be a threat to validity of our study results or a limitation in our study. Both stress-management intervention for patients and practitioners are expected to have beneficial effects on the involved individuals. We expect to significantly minimise tension, perceived stress during the cardiac catheterization in patients of the intervention group. Additionally, we expect a favourable effect on physiological outcome like heart rate, blood pressure (in patients) and heart rate variability (in practitioners).

An effective stress reduction should be favourable for the individual patients but it should further prevent complications and stressful incidents during the cardiac catheterization. On this account a successful patient intervention may add to less hazard and more safety in the workplace, improved working conditions and occupational safety, preservation of earning capacity, avoidance of participation restrictions and loss of performance for the practitioners. These positive aspects of work safety for the staff members of the catheterization lab should additionally pay off for patient security and satisfaction. The study may add knowledge how to eliminate stressful exposures and to contribute to more (psychological) security, less output losses and exhaustion during work. All evaluated guidelines, materials for the psychoeducational intervention in patients and MBSR intervention in practitioners should be transferred in clinical routines.

Conclusions and Recommendation

As we transition away from a fee-for-service approach, the importance of operational efficiency, a value common in the corporate sector, cannot be overstated in cath labs. Saving time, increasing output, and decreasing expenses

can all result from identifying inefficiencies in cath lab care delivery. To achieve operational efficiency, it is also crucial to lessen the money spent on supplies. Management of cath labs can benefit from a congruence model's methodical approach to improving operational efficiency. Future research should encourage cardiologist offices to disclose findings from efficiency improvement programmes using metrics analogous to those described in this paper.

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