

EFFECT OF BIOFEEDBACK PSYCHOPROPHYLACTIC PROTOCOL PRE AND POSTSURGICAL

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Abstract: Psychological research walked with the idea of trying to objectively outline the contents of the human mind that are hardly observable, where subjectivity expressed in emotions, thoughts and behaviors are revealed in every response that the body runs. Patients in the Hospital of the Ecuadorian Institute of Social Security Ibarra demonstrating that subjectivity as stress, when facing a surgical procedure outlined their emotional reactions mainly anxiety and sadness. Psychological intervention sailed from collecting information of emotional expressions, using psychometric techniques; and reaction of the autonomous nervous system in the presence of pre- and postoperative stress using psychophysiological assessment techniques. The reduction of such events was performed by means of psychotherapeutic effect of biofeedback (biofeedback), since the benefit provided to the patient as a technique Accompanying prior to entering the operating room time and in the immediate convalescence was evident after surgery. From the results obtained psychoprophylactic intervention protocol appears, confirming that the application resource biofeedback intervention favorably complements professional psychologist to reduce stress and its manifestations in patients around the surgical process.

Key words: Biofeedback; surgical psychoprophylaxis; surgical stress; psychophysiology; psychotherapeutics techniques; psychophysiological and psychometric assessment techniques; heart rate variability.

Resumen: La investigación psicológica se encaminó con la idea de intentar esbozar objetivamente los contenidos de la mente humana que son observables difícilmente, donde la subjetividad expresada en emociones, pensamientos y conductas se revela en cada respuesta que el cuerpo ejecuta. Los pacientes del Hospital del Instituto Ecuatoriano de Seguridad Social de Ibarra manifestaban dicha subjetividad como estrés, en el momento de enfrentarse a un proceso quirúrgico, sus reacciones afectivas principalmente esbozaron ansiedad y tristeza. La intervención psicológica zarpó desde la recolección de información de las expresiones emocionales, usando técnicas psicométricas; y la reacción del sistema nervioso autónomo en presencia de estrés pre y postoperatorio, empleando técnicas de evaluación psicofisiológica. La reducción de dichas manifestaciones se realizó por medio del efecto psicoterapéutico de biorretroalimentación (biofeedback), dado que se evidenció el beneficio que brinda al paciente como técnica de acompañamiento en el momento previo al ingreso a la sala de operaciones y en la convalecencia inmediata después de una cirugía. De los resultados obtenidos se desprende un protocolo de intervención psicoprofiláctica, confirmando que la aplicación del recurso de biorretroalimentación complementa favorablemente la intervención del profesional en psicología en la reducción del estrés y sus manifestaciones en los pacientes alrededor del proceso quirúrgico.

Palabras claves: Biorretroalimentación; psicoprofilaxis quirúrgica; estrés quirúrgico; psicofisiología; técnicas psicoterapéuticas; técnicas de evaluación psicofisiológica y psicométrica; variabilidad de la frecuencia cardíaca.

Introduction

Patients attending health houses second-level conditions that require surgical intervention, crossing all this hospital process with the presence of stress, expressed in psychological manifestations, masked in fear and / or sadness. Those psychological manifestations since ancient times occurred relate to the idiosyncrasies of individual death, because surgery is a potent stressor complex; and stressful nature is not unique, depends not only hospitalization but the disease, events and their consequences, even of biopsychological constitution of each individual and successfully address this process reduces time after surgery convalescence.

In the interpretation of the definition of biofeedback (biofeedback), several authors agree that is the psychophysiological method to record vital frequencies body of an individual, reflecting the information on the activity of biological process. This same information is useful to modify aspects involuntary consciously; that, through the use of sensitive instrumentation provides accurate and immediate information regarding muscle activity, brain waves, body temperature, heart rate, blood pressure and other bodily functions susceptible to measurement, quantification and feedback. It is precisely the knowledge of results allowing learning to control a given behavior. In the case of such conduct is physiological biofeedback, behavior which, under normal conditions, is not conscious, but by technological support may perceive different.

To Mucci (2004) surgical psicoprofilaxis is one psychotherapeutic process with preventive objectives focused on the surgical situation, planning the affective, cognitive, behavioral and interactional patient's functional promotion. Use resources to meet surgery, reduce adverse effects and facilitate the biopsychosocial recovery. Within the general objectives of surgical psicoprofilaxis find that facilitates the processing of information, provides resources to meet the mindset that surgery and that the disease imposes on the patient, stabilize the psychological symptoms to tolerable levels, reduce basic fears, prevent surgical experience implements a psychopathology.

Better preparation of the patient psychological component is to provide information, counseling throughout the surgical process and the following sensations intervention, fits the person, reducing stressful characteristics and emotional reactions, variability biofeedback was used heart rate (HRV), as an exercise in psychological approach to stressful situations such as surgery and use of this lawsuit instituted as a preventative tool and adjunct to proper recovery of the individual resource.

The emotional manifestations found in psychometric and psychophysiological signed anxiety and depression, according Corr (2008), where defensive behaviors when it enters a appetitive environment, anxiety experienced when the threat is preventable and depression is observed when the threat is inevitably, therefore proposes a scheme with respect to defensive systems that can route to the pathology of emotional reactions and affections against danger, to solve this scheme timely psychological intervention was performed. Psychoprophylactic surgical intervention in three indicators that demonstrated the beneficial effect of biofeedback of heart rate variability (HRV) of patients before and after surgery, which were matched with data from psychometric scales were found.

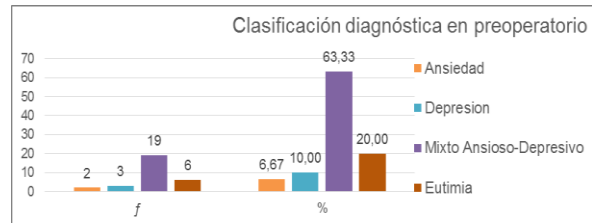
PRESURGERY

Anxiety-Depression Scale Goldberg

STADISTIC TABLE

Diagnostic classification	f	%
Anxiety	2	6,67
Depression	3	10,00
Anxiety/Depression	19	63,33
Euthymia	6	20,00
	30	100

GRAPHIC REPRESENTATION



SOURCE: ANXIETY-DEPRESSION SCALE GOLDBERG PRESURGERY
AUTHOR: JUAN F. CADENA

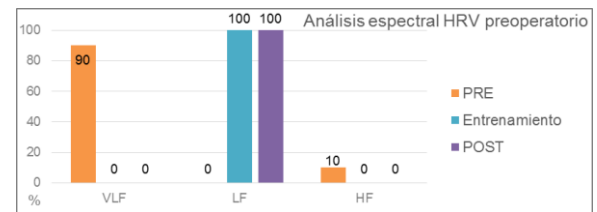
Biofeedback Registry

1. Spectral Analysis of Heart Rate Variability (HRV) presurgery

STADISTIC TABLE

Heart Frequency	Pre - training		Training		Post - training	
	f	%	f	%	f	%
Very Low Frequency (VLF)	27	90,00	0	0	0	0
Low Frequency (LF)	0	0	30	100	30	100
High Frequency (HF)	3	10,00	0	0	0	0
	30	100	30	100	30	100

GRAPHIC REPRESENTATION



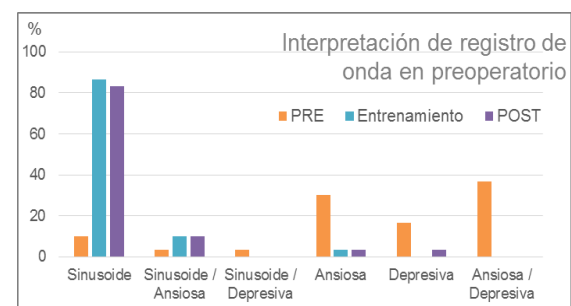
SOURCE: BIOFEEDBACK REGISTRY
AUTHOR: JUAN F. CADENA

2. Wave interpretation registry presurgery

STADISTIC TABLE

Wave classification	Pre - training		Training		Post - training	
	f	%	f	%	f	%
Sinusoid	3	10,00	26	86,67	25	83,33
Sinusoid/Anxious	1	3,33	3	10,00	3	10,00
Sinusoid/Depressive	1	3,33	0	0,00	0	0,00
Anxious	9	30,00	1	3,33	1	3,33
Depressive	5	16,67	0	0,00	1	3,33
Anxious/Depressive	11	36,67	0	0,00	0	0,00
	30	100	30	100	30	100

GRAPHIC REPRESENTATION



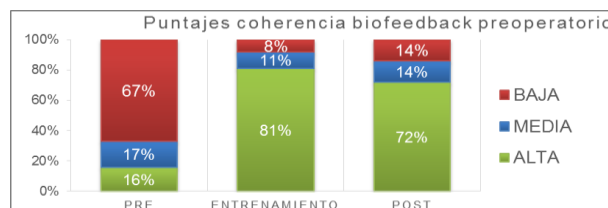
SOURCE: BIOFEEDBACK REGISTRY
AUTHOR: JUAN F. CADENA

3. Biofeedback coherence score presurgery

STADISTIC TABLE

Biofeedback Coherence	Pre - training		Training		Post - training	
	(\bar{X})	(S)	(\bar{X})	(S)	(\bar{X})	(S)
HIGH	16%	13%	81%	15%	72%	24%
MIDDLE	17%	6%	11%	10%	14%	11%
LOW	67%	17%	8%	8%	14%	15%

GRAPHIC REPRESENTATION



SOURCE: BIOFEEDBACK REGISTRY
AUTHOR: JUAN F. CADENA

Correlation of presurgery instruments at the pre-training phase

STADISTIC TABLE

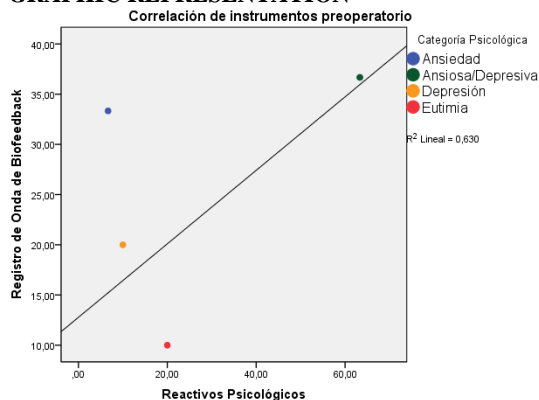
Diagnostic Classification	Goldberg Scale		Wave Biofeedback Registry	
	f	%	f	%
Anxiety	2	6,67	10	33,33
Depressive	3	10,00	6	20,00
Anxiety / Depression	19	63,33	11	36,67
Euthymia	6	20,00	3	10,00
Total	30	100	30	100

STADISTIC TABLE

PRESURGERY CORRELATION		Goldberg Scale	Wave Registry
Goldberg Scale	Pearson Correlation	1	0,794
	Sig. (bilateral)		0,000
Wave Registry	Pearson Correlation	0,794	1
	Sig. (bilateral)	0,000	

SOURCE: SOFTWARE SPSS
AUTHOR: JUAN F. CADENA

GRAPHIC REPRESENTATION



FUENTE: SOFTWARE SPSS
AUTOR: JUAN F. CADENA

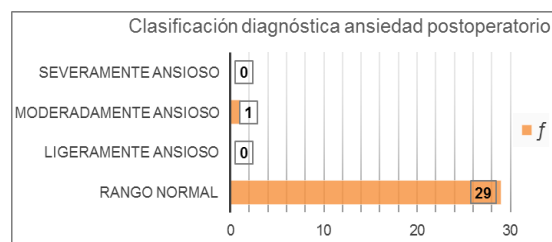
POSTSURGERY

Zung Anxiety Scale

STADISTIC TABLE

Diagnostic classification	f	%
Normal Range	29	96,67
Slightly anxious	0	0,00
Moderately anxious	1	3,33
Severely anxious	0	0,00
	30	100

GRAPHIC REPRESENTATION



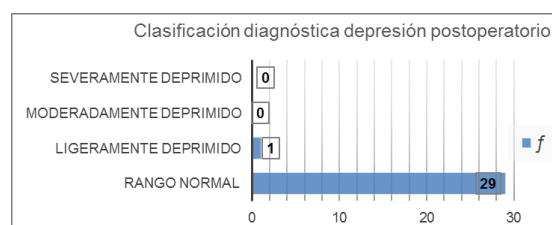
SOURCE: ZUNG ANXIETY SCALE
AUTHOR: JUAN F. CADENA

Zung – Condes Depression Scale

STADISTIC TABLE

Diagnostic classification	f	%
Normal Range	29	96,67
Slightly depressed	1	3,33
Moderately depressed	0	0,00
Severely depressed	0	0,00
	30	100

GRAPHIC REPRESENTATION



SOURCE: ZUNG – CONDES DEPRESSION SCALE
AUTHOR: JUAN F. CADENA

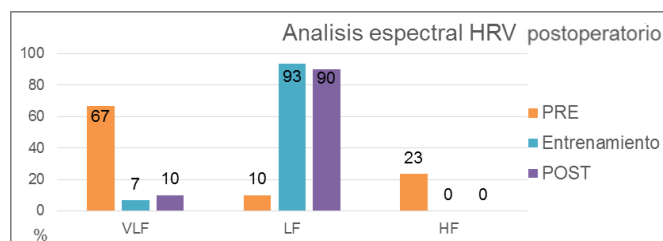
Biofeedback Registry

1. Spectral Analysis of Heart Rate Variability (HRV) postsurgery

STADISTIC TABLE

Heart Frequency	Pre - training		Training		Post - training	
	f	%	f	%	f	%
Very Low Frequency (VLF)	20	66,67	2	6,67	3	10,00
Low Frequency (LF)	3	10,00	28	93,33	27	90,00
High Frequency (HF)	7	23,33	0	0	0	0
	30	100	30	100	30	100

GRAPHIC REPRESENTATION



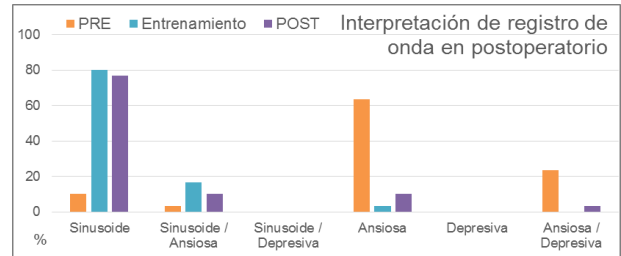
SOURCE: ZUNG – CONDES DEPRESSION SCALE
AUTHOR: JUAN F. CADENA

2. Wave interpretation registry postsurgery

STADISTIC TABLE

Wave classification	Pre - training		Training		Post - training	
	f	%	f	%	f	%
Sinusoid	3	10,00	24	80,00	23	76,67
Sinusoid/Anxious	1	3,33	5	16,67	3	10,00
Sinusoid/Depressive	0	0,00	0	0,00	0	0,00
Anxious	19	63,33	1	3,33	3	10,00
Depressive	0	0,00	0	0,00	0	0,00
Anxious/Depressive	7	23,33	0	0,00	1	3,33
	30	100	30	100	30	100

GRAPHIC REPRESENTATION



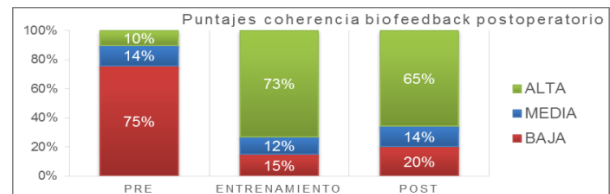
SOURCE: BIOFEEDBACK REGISTRY
AUTHOR: JUAN F. CADENA

3. Biofeedback coherence score postsurgery

STADISTIC TABLE

Biofeedback Coherence	Pre - training		Training		Post - training	
	(\bar{X})	(S)	(\bar{X})	(S)	(\bar{X})	(S)
HIGH	10%	10%	73%	29%	65%	31%
MIDDLE	14%	8%	12%	11%	14%	10%
LOW	75%	16%	15%	15%	20%	26%

GRAPHIC REPRESENTATION



SOURCE: BIOFEEDBACK REGISTRY
AUTHOR: JUAN F. CADENA

Correlation of postsurgery instruments at the pre-training phase

CUADRO ESTADÍSTICO

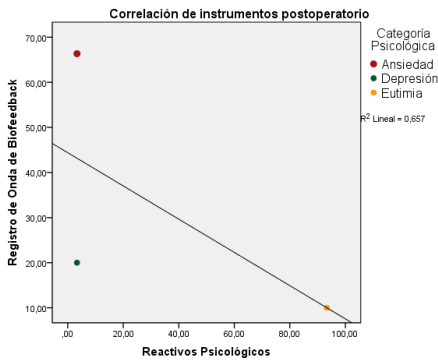
Diagnostic classification	Psychological Test		Wave Biofeedback Registry	
	f	%	f	%
Anxiety	1	3,33	20	66,63
Depressive	1	3,33	0	20,00
Anxiety / Depressive	0	0	7	23,33
Euthymia	28	93,34	3	10,00
Total	30	100	30	100

CUADRO ESTADÍSTICO

POSTSURGERY CORRELATION		Psychological Test	Wave registry
Psychological Test	Pearson Correlation	1	-0,810
	Sig. (bilateral)		0,000
Wave registry	Pearson Correlation	-0,810	1
	Sig. (bilateral)	0,000	

FUENTE: SOFTWARE SPSS
AUTOR: JUAN F. CADENA

GRAPHIC REPRESENTATION



FUENTE: SOFTWARE SPSS
AUTOR: JUAN F. CADENA

It should be noted that the mirrored data are arranged from the tabulation of information, a high level of sensitivity is handled in them; to this every psychological reagent handling your confidence, registration wave at the interface of biofeedback was established by the qualitative interpretation of the researcher, associated with symptomatology observed in subjects and provisions that the developer of the software places as a guide data interpretation.

Methodology: Psychological intervention was divided into two moments: *PRESURGERY* y *POSTSURGERY*. In each of the three phases of application times of the clinical and psychometric split method, which were named: *Pre-training*, *Training* y *Post-training*.

The first phase of *PRE-TRAINING* at presurgery moment, a brief psychological structured interview, where personal history of the patient was recorded through a Psychological Clinic Brief History was made. Higher mental functions were evaluated Anxiety Scale-Depression Goldberg was applied and combined with the registration of the HRV biofeedback software company emWave® Pro Heartmath®. Postoperatively time the Zung Anxiety Scale was applied and the Zung Depression Scale and Counts, combined with a technique called psychological debriefing and recording of HRV biofeedback software. *Pre-entrenamiento* phase is performed in a period of ten minutes in both moments.

Second phase or *TRAINING* at pre and postsurgery moment, the interface exercise technique biofeedback, where the patient is induced suggestions, runs behavioral and cognitive enhancers to induce the patient to perform the technique in order to remove surgical stress and psychological manifestations is used, this phase has an approximate time of ten minutes each time.

Thir phase denominated *POST-TRAINING* in both moments, training technique biofeedback for which he used an exercise within the software, the interface is extended to ten minutes, was obtained as an indicator of learning the technique when culminating exercise ahead of time, applies to this cognitive enhancers were used and behavioral maximize the performance of patients.

Upon completion of each phase is continued where performance of the patient at the time of each assessment, recording and performing biofeedback technique is explained.

Psychological manifestations found were also reported and the patient for the implementation of the technique is prepared each lag is within five minutes.

Data were collected from observation forms, psychometric scales and the information obtained from these to be organized in tables and statistical graphs for better understanding tabulated.

Evaluation of Results: The effect of biofeedback technique in the affective manifestations of patients undergoing surgical stress is set to benefit in reducing psychological reactions, for which it was established as psychoprophylactic intervention protocol has its impacts in the following areas:

Social Domain: The use of psychophysiological instruments in the evaluation of mood and training regulating emotional manifestations permeates every individual cognition of the actions of a professional in psychology which combines the biological field, technology and psychology, decreasing the subjective experience of emotional response, providing resources for coping with surgical stress.

Scientific Domain: Relate psychological and psychophysiological evaluation process clinician provides a widely worthwhile goal to intrude into the exclusive subtle instances of individual subjectivity as the mood and the myriad of thoughts that each individual faces as surgical stress. He also brings with theoretical and practical bases in development of psychotherapeutic techniques that prevent empowerment of psychopathological clinical pictures.

Professional Domain: It leaves open the door to the use of technological tools such evaluative and therapeutic resource, as an adjunct to a closer reality of individual diagnosis and establishes as a tool for direct application *in situ*.

Related investigations: Research on the application of biofeedback in pre- and postsurgical patients do not exist in local repositories.

However, research is motivated by psychological intervention carried out in 2011 in the same health institution by Andrade, S. traditionally framed the application of psychological techniques to reduce patient anxiety. He also made reference to the "Review of biofeedback techniques and their applications," Research by Conde Balaña Pasto & Menéndez (2002) that led to the acquisition of knowledge in the various forms of biofeedback applied in different contexts.

Conclusions

1. Psychological manifestations presented by patients in the preoperative and postoperative moments were anxiety and depression, found through psychophysiological records, clinical observation and psychological scores reagents. The appreciation is associated with the philosophical school hermeneutics with its objective to interpret how best coping surgery by the subjects investigated.

2. The indicators of the effect of biofeedback technique that settled in the investigation was three. The first spectral analysis of HRV forming frequencies; the second type of wave recorded in the psychophysiological software; finally reached the level of consistency in the performance of biofeedback training.
3. The biofeedback technique is established as an effective technique to evaluate, diagnose and treat psychological manifestations in patients undergoing stress.
4. The intervention protocol has been established as a practical psychotherapeutic resource. The steps have been followed constitute a planned and documented application with the intention of helping individuals overcome successful surgery, which has been reflected in patient satisfaction.

Recommend

1. One way to provide a resource for coping successfully refunded homeostatic state of health of patients in public hospitals by the Ecuadorian state is integrated into their surgical psychoprophylaxis.
2. Bring a descriptive statistical frequency as stressful to patients before and after surgery now provide information attached to the psychological reality of users of the Hospital of the Ecuadorian Institute of Social Security Ibarra.
3. The authorities of the Ecuadorian Social Security Hospital Ibarra, is recommended to promote the evaluation of the psychological status of each patient to undergo surgery.
4. Coordinate a multidisciplinary between professionals in psychology, medicine and nursing, will allow the surgical process is performing in an effective manner at all times of intervention.

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