Behavior-Cognitive Protocol to Reduce Anxiety during a Magnetic Resonance Examination

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Abstract. The objective of this study is to elaborate and evaluate a protocol aiming to reduce fear and anxiety in patients who will be submitted to the Magnetic Resonance Image examination. A sample of 51 patients was randomly distributed in four groups: three of them received different specific interventions and the fourth one was the Control Group. Group A was provided with detailed information about the procedure, cognitive restructuring and relaxation and controlled breathing instructions. The Group B was provided with relaxation and controlled breathing instructions; Group C received detailed information about the procedure and cognitive restructuring; and the Control Group received only general information about the procedure. STAI inventory was applied to measure the anxiety levels. A questionnaire was elaborated to arouse feelings towards the examination. Both STAI inventory and the elaborated questionnaire were applied prior and post examination. The intervention experienced by Group A has been shown the most effective one, significantly reducing anxiety-state, fear and distress in the post-intervention and post-resonance periods. Group B patients have had their distress reduced after the procedure. Group C intervention favored the post-intervention distress reduction. Consequently, the techniques combination proposed on Group A protocol is considered the most effective one, maybe because it comprises the three response levels (cognitive, autonomic and behavioral).

Keywords: anxiety, fear, magnetic resonance, cognitive-behavior therapy.

1. Introduction

Researches show the benefits obtained by patients who are psychologically prepared for medical or surgical procedures [1-4]. However, it is rare to find a clinic or hospital that offers this preparing program preceding such procedures. When that happens it is often managed by technicians or the standard nursing staff who are not fully trained, which can be a restricting factor to psychologically benefit the patients.

Beyond the fact that the patients have to direct themselves to the hospital, an occurrence that represents a shift in their daily routine and demands acclimation, generally, they will be experiencing an unknown and often threatening procedure [5]. Therefore, the way the patients experience the medical procedures can be responsible for affecting (or maybe not) even more their psychological and physical conditions [6, 7].

On the other hand, studies show that patients who remain in control while coping with the procedures and are truly willing to do it, achieve better results during and after the procedures [8].

In this sense, the medical procedures fear would represent a threat to patients’ emotional and physical integrity. They perceive their fragility and limitations because their anxieties and uncertainties arouse when they get in touch with the suffering anticipation. The source of this kind of anxiety is linked to the fear of the unknown, the perspective of feeling pain and/or discomfort and the necessity to cope with their own vulnerability and mortality [9, 2]. The same thing can happen in relation to magnetic resonance imaging procedures. Patients experience a negative perspective because they believe this situation can lead them to unpleasant consequences, as well as anxiety about the diagnostic or prognostic and lack of control during the procedure [9, 10].

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Several different interventions have been tested in order to reduce anxiety during the imaging process, they include: modeling, information provision, active listening with music and video, training in relaxation and cognitive techniques [1, 10].

Quirk et al., for instance, have tested three different psychological interventions in order to reduce anxiety during magnetic resonance procedures and they observed that information provision associated to relaxation has shown to be the most effective intervention to reduce anxiety [11].

Promoting health means, among other things, to elucidate the patient about the procedure one will be submitted to with clear and objective explanations, clearing up their doubts [12, 13]. Such stance reminds us there is a name, a history behind the diagnosis and this person has the right and the desire to know it better. Bearing this in mind, it is important to stress the need of a conjoint work development towards the preventive medicine elucidation as well as the healing medicine [5, 14, 15]. Therefore, it is likely to consider the importance of offering patients, who will be submitted to the procedure, a set of behavioral techniques capable to cope with the situation associated to basic information about the possible resultant sensations after the procedure [16-18]. Soothe and relieve the anxiety and apprehension, because even when they are not explicit, they are implicitly present. When the patient is capable to evaluate this stressful situation, it promotes a more controlled sensation, enhancing their self-control and self-effectiveness [16-19].

Therefore, the objective of this research is to elaborate and evaluate a protocol aiming at reduction in fear and anxiety levels in patients who will be submitted to magnetic resonance imaging procedure.

2. Materials and Methods
The sample comprised 51 patients (28 women and 23 men) aging between 18 and 60 years, with assorted education background, who were assigned for magnetic resonance imaging procedure at the São Paulo Hospital. The subjects, previously scheduled for the examination, were heading to the waiting room where they filled in a form standardized by the hospital with questions regarding to name, age, weight, medication prescriptions, metallic prosthesis, fasting period, etc. Afterwards, they were provided with routine care, where the nursing staff gave general, formal information about the magnetic resonance examination, such as: entering inside the machine, equipment banging noises, examination average lasting period and estimated waiting period. After concluding this routine, and signing the free informed consent term, the patient were approached and invited to take part of this research. The inclusion criteria observed: age, the fact of not having a previous experience with this magnetic resonance procedure; the indication their procedure did not require any anesthetics but it did require a complete entering inside the machine to perform the examination, and at last, they were in suitably emotional and physical conditions to answer the requirements of this research. The subjects were randomly divided in four groups: A, B, C and Control Group. They were all submitted to the application of the STAI Trait-State Inventory instrument (that scrutinizes anxiety phenomena in adults), translated and adapted to the Brazilian population [20]. Anxiety-State refers to a transitory emotional state or tension reaction, conscious restlessness and apprehension in a specific moment in time. Anxiety-Trait refers to individual ways of reacting towards situations perceived as threatening, in this case, how the person generally feels. A questionnaire presenting items such as: pain, anguish, uncertainty, sadness, abandonment, anxiety, fear and distress through analogical scales ranging from 0 to 10, was applied allowing the subjects to evaluate their own subjective state (feelings and expectations) towards the examination. In terms of results, it was considered only the anxiety, fear and distress items due to the fact they were the most mentioned.

Group Structure: The control group did not receive any specific intervention, beyond the general information about the magnetic resonance procedure. The intervention on Group A was composed of: (a) detailed information about magnetic resonance, (b) cognitive restructuring, and (c) relaxation and controlled breathing techniques instructions. The intervention on Group C constituted in (a) detailed information about the procedure and (b) cognitive restructuring.
2.1. Detailed Information about the Magnetic Resonance Procedure

The procedure was fully explained to the patients: describing the physical environment, the exam specific routine, the exam benefits and effectiveness were also mentioned. The step by step information assures the patient about some aspects of the procedure such as: sufficient air quantity and lighting; the loud banging sound produced by the equipment; its two openings configuration; the possibility of communication with the technician through a microphone; technician instructions about breathing and painless procedure. It’s also explained this examination does not represent any risks or compromises health. The possibility to previously know the environment and the equipment was also assured to patients so they could really feel more at ease.

2.2. Cognitive Restructuring

Cognitive techniques were utilized to analyze and to restructure patients’ belief system. The most addressed thoughts in this intervention were directly associated to unpleasant sensations related to situations the patients feared. The objective was to undermine their entrenched beliefs in a systematic way, in other words, to discuss, contest and to challenge such pre-conceived ideas [20] offering confronting strategies, such as: changing the attention focus, as well as the inner dialogue utilization.

2.3. Relaxation Instructions Through Controlled Breathing

In this strategy, the patient received relaxation and controlled breathing basic instructions, so they could use them in the exam moment. “...you will be lying down, therefore, try to leave your body really heavy and relaxed...take a deep breath, slowly inhaling the air through the nose and gently exhaling through the mouth... do it in a natural and rhythmic way, because, that will bring you a tranquility and calm feeling during the exam... focus on the breathing, divert your attention from the outside... if you like it, close your eyes and imagine a pleasant scene... keep on with the breathing, turn off, let go of your worries, experience only the scene you have imagined... bring your attention back to follow the technician instructions when he asks to hold back your breath for an instant through the microphone...”

The interventions applied to groups A, B and C take about 15 minutes. The control group waited for 15 minutes as well.

3. Statistical Analysis

The significance level adopted was 0.05. Descriptive levels inferior to these were considered significant and were represented by an asterisk (*). To observe the groups socio-demographic characteristics it was utilized the Chi-squared test. The ANOVA test was used to evaluate the anxiety-trait score differences (STAI) at the pre-intervention moment. The Tukey test was used to a comparative analysis of the anxiety-state at different moments (pre-intervention, post-intervention and post-resonance). It was also used to observe the average value of the analogic variables (anxiety, fear and distress) in different moments when compared to the initial moment. The Sperman Correlation was utilized to evaluate the possible correlation between STAI anxiety index and anxiety, fear and distress index in the analigic scales. The data was analyzed through the Statistics for Windows Program, version 6.0.

4. Results

Table 1 shows the comparison among the groups, showing they are homogeneous regarding gender, age, and anxiety-trait (STAI). Group A, who experienced the intervention a+b+c, presented a significant reduction in the anxiety-state index (p=0.01) at the post-intervention moment when compared to pre-intervention moment as indicated in table 2.

We can observe in Table 3 that Group A presented a statistical significant reduction in the average value of the Fear variable at the pre-intervention moment. It has also been observed a statistical significant reduction in the average value of the Distress variable at the post-intervention moment (p=0.001) and after magnetic resonance examination (p=0.04) when compared to the initial moment.
In Table 4, we can observe that in the Control Group there was a statistical significant correlation between the anxiety variable and STAI-state (0.73). Considering Group A, there is a good and significant correlation between the Anxiety (0.66), Fear (0.67) and Distress (0.61) measures and the STAI-State scores. Group C showed a high correlation between Anxiety and STAI-State (0.73). In relation to Group B there has not been observed any significant correlations between the variables obtained through analogic scales and scores obtained through STAI-State index.

In Table 1, we present the subjects distribution according to gender, age and the STAI-Trait average score. The results show there are not significant differences, therefore they are homogeneous groups.

* p<0.05, differs from the initial moment in the correspondent group (Tukey Test).

In Table 3, we can observe that in Group A there was a statistical significant reduction in the average value for the Fear variable at the post-procedure moment when compared to the initial moment and it has

* p<0.05, differs at the pre-intervention moment in the correspondent group (Tukey Test).

In Table 2, we can observe a statistical significant reduction in Group A, and the post-intervention moment when compared to pre-intervention moment.

* p<0.05, differs from the initial moment in the correspondent group (Tukey Test).

In Table 3, we can observe that in Group A there was a statistical significant reduction in the average value for the Fear variable at the post-procedure moment when compared to the initial moment and it has
also been observed a statistical significant reduction in the average value for the Distress variable in the post-intervention and post-procedure moment when compared to the initial moment.

Table 4. Spearman Correlation between initial STAI scores and initial analogic variables.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Anxiety</th>
<th>Fear</th>
<th>Distress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0.73*</td>
<td>0.34</td>
<td>0.42</td>
</tr>
<tr>
<td>A</td>
<td>0.66*</td>
<td>0.67*</td>
<td>0.61*</td>
</tr>
<tr>
<td>B</td>
<td>0.28</td>
<td>0.23</td>
<td>0.16</td>
</tr>
<tr>
<td>C</td>
<td>0.83*</td>
<td>0.51</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Good Correlation > 0.6.

In table 4 we can observe in the Control Group there is a statistical significant correlation between Anxiety variable and STAI-State. Considering Group A, there is a correlation between Anxiety, Fear, Distress measures and the STAI-State score. In Group C there is a high correlation between Anxiety and STAI-State. Considering Group B there has not been observed any correlations between the variables obtained through analogic scales and the scores obtained through STAI-State.

5. Discussion

The results presented in this study corroborate many studies in the literature about the existing relation between the patients’ anxiety levels reduction and an adequate preparation for the magnetic resonance procedure. [1, 3, 4]. This study, in particular, shows that a preparation comprised of the three response levels (cognitive, autonomic and behavioral) can be more effective in the Fear and Anxiety reduction while facing the procedure. Group A combined intervention has shown to be the most effective in the anxiety, fear and distress reduction post-intervention and post-magnetic resonance. This result can be explained due to the fact that in this group we worked with cognitive restructuring techniques aiming possible dysfunctional ideas about the procedure. The patient received instructions on relaxation and controlled breathing that he could use in the moment of the exam as a confronting strategy to control autonomic reactions. Detailed information about the magnetic resonance procedures were handed out to the patients favoring their self-control maintenance during the procedure.

It is important to highlight that isolated interventions on Groups B and C could not achieve a significant anxiety, fear and distress reduction. The data related to Group C, where the distress was only reduced after completing the procedure can explain that we need to put confronting strategies in practice if we are dealing with autonomic reactions, in order to provoke changes. Only the instructions cannot be enough to reduce physiological symptoms [21].

The data obtained in Group C showed that even after the MR examination, there was not a distress level reduction, this can be due to the fact that the physiological symptoms were not addressed, in other words, the patients did not acquire confronting strategies to deal with eventual symptoms during the procedure.

The findings of this study support the conclusion that the method of providing systematic information, offering relaxation, controlled breathing and cognitive restructuring information may consist in an effective protocol to reduce anxiety towards the magnetic resonance procedure. For this reason we highlight the benefits of this study considering the length of time involved in this protocol application, low budget and by the fact that it can be used by many different multipliers in the health area. Therefore, with minimal resources it can be conveniently embodied in the routine of all patients who will undergo a magnetic resonance examination, independently if they present excessive anxiety or not, avoiding the very serious problems resulting from a possible desistance or emotional incapacity to undergo the exam, which is of great importance to modern medicine science.

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7. References


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