International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 05, 2020
ISSN: 1475-7192

Cognitive-Behavioral Therapy Combined with Mindfulness for a Case of Severe Sleep Bruxism and Social Anxiety in an Elderly Woman: A Single Case Study for 6-Month Follow-up

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Abstract--- *The purpose of the present study was to describe the case of a 73-year-old elderly woman patient with severe sleep bruxism and social anxiety treated with cognitive-behavioral therapy combined with mindfulness and social skills training. Single case was assessed in pre- and post-intervention and 6-month follow-up. The treatment was carried out for 21 sessions of 60 minutes of psychotherapy in a school-clinic. The following measures were used: Questionnaire for Detecting Sleep Bruxism (QDSB), The Pittsburgh Sleep Quality Index (PSQI), Perceived Stress Scale (PSS-14), Beck Anxiety Inventory (BAI), Brunel Mood Scale (BRUMS), and daily measures. Results indicated improvement for all variables: reduction in sleep bruxism episodes, anxiety and stress levels and improvement in humor level. In summary, these significant changes in patient' well-being and quality of life were evident. Therefore, cognitive-behavioral therapies such as psychotherapy, physical exercise and lifestyle changes, which are aimed at stress and anxiety reduction, may be auxiliary in the treatment of sleep bruxism*.

Keywords--- *Cognitive-behavioral Therapy, Mindfulness, Sleep Bruxism, Social Anxiety, Elderly Woman*.

I. INTRODUCTION

Sleep Bruxism (SB) has been defined as forcible clenching or grinding of the teeth, or a combination of both, it has long been regarded as a disorder requiring treatment. It consists of a Para functional grinding of teeth and an oral habit consisting of involuntary rhythmic or spasmodic non-functional gnashing, grinding or clenching of the teeth, in other than chewing movements of the mandible, which may lead to occlusal trauma or neurosis. It is the most detrimental thing among the Para functional activities of the stomatognathic system (1, 2, 3).

Thus, it (SB) may lead to periodontal tissue lesions, and articular and muscular damage. It may appear to be induced central and autonomic nervous system and, in part, it is associated with arousal reactions during sleep. It is possible that underlying anxiety and stress may exacerbate bruxism along with more frequent arousals during sleep (2). Besides that, neurological factors, peripheral stimulus, psychogenic elements (4, 1) and emotional issues (5) might be involved.

Alternative therapies such as relaxation and sleep hygiene techniques have been proposed for bruxism, especially in cases related to stress and anxiety (3, 4, 6). Cognitive-behavioral therapy (CBT), due to its brevity, objectivity,

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DOI: 10.37200/IJPR/V24I5/PR201789
Received: 13 Feb 2020 | Revised: 07 Mar 2020 | Accepted: 23 Mar 2020

and the possibility of scientific validation, has been shown to be a viable alternative (7, 8). Social anxiety (SA) is characterized by intense fear and avoidance of social situations. Individuals with SA experience decreased life satisfaction. Besides, they have impaired functioning across multiple domains in general social functioning.

On the other hand, poor sleep may lead to greater social avoidance and there may be a relationship between sleep problems and anxiety (9, 10). Thus, it could suggest that poor sleep may worsen social avoidance and anxiety over time (11). Despite the evidence for CBT's efficacy, this type of intervention has its limitations. A substantial number of patients do not respond or respond only partially (12). Therefore, there is a need to develop and evaluate the use of alternative intervention together with CBT, such as mindfulness practice. Evaluation of the efficacy of mindfulness-based interventions for stress and anxiety has, in general been positive (13, 14).

The elderly population has been increasing around the world. In developed countries, aging is accompanied by improvements in quality of life. Among the problems that affect older women, complaints related to psychobiological aspects, such as those involving a physiological context that might interfere in the behavior. Among the most relevant psychobiological aspects are those involved with changes in sleep pattern; mood swings; changes in cognitive function (15, 16). Other external perception issues may be retirement, death of family members and friends, social role changes (17).

A longitudinal study investigated the successful aging and life satisfaction over the life cycle, it also assessed the relationship between self-rated health and life satisfaction among older people about 75 years old (18). They observed that life satisfaction remains stable throughout life and tends to reach lower levels between 30 and 40 years old and among the elderly.

Old people with strong social close relationships tend to have better physical and mental health than those who do not have relationship with others. Social support might act to restore psychological resources, such as feelings of control, self-esteem and meanings for life. When an elderly person deals with a threat and they judge themselves to be incompetent, they face a cascade of processes that increase stress, which includes the release of cortisol hormone, increased heart rate, decreased immune function (16, 17).

The aim of this study was to describe the case of an elderly woman with severe sleep bruxism and social anxiety treated with cognitive behavioral therapy combined with mindfulness.

II. METHOD

2.1. Design

The therapeutic process was designed using the following techniques and strategies: psychoeducation for anxiety disorders, stress and sleep disorders in cognitive behavioral approach; cognitive conceptualization; coping card, social skills training; dysfunctional thoughts record (DTR), making decision; examination of evidence; Socratic questioning and Downward arrow; increased pleasured activities and relapse prevention. In the psychoeducation sessions the app "3D Medical app The Brain and Nervous System Pro III" was used in iPad for illustrating 3D neurochemical, physiological, and cognitive processes involved (19). Protocol incorporated psychoeducation, cognitive restructuring skills. The intervention included training in body scan meditation, sitting meditation, and

DOI: 10.37200/IJPR/V24I5/PR201789
Received: 13 Feb 2020 | Revised: 07 Mar 2020 | Accepted: 23 Mar 2020

mindful stretching, as well as a focus on the application of mindfulness as a method for noticing reactions and responding in new ways in social situations. The intervention also included additional readings and mindfulness exercises to supplement ongoing practice.

2.2. Clinical Characterization

The attendance was part of the schedule of the clinic-school of a university in São Paulo. It was supervised weekly by an advisor of the institution itself. For this clinical service, the patient contacted to institution and request their name for a waitlist. It was sorted by order of request and according to the compatibility of schedules between patients and therapists.

2.3. Main Complaint

In the initial interview, the patient reported suffering from SB. Once she could not sleep for long years, for being fear of breaking down her teeth. The patient was referred to psychotherapy by a dental surgeon, after three surgeries, dental implant and attempts to control SB symptoms, which had unsatisfactory results. Nonetheless, she continued to be treated by a dentist and occupational therapist. Episodes of nocturnal enuresis and SA were identified by the therapist during the evaluation sessions.

2.4. Ethical Aspects

The publication of this case has been authorized by the patient through the Informed Consent Form adopted by the institution where she received care under clinical protocol No. 179808.

2.5. Participant

M. is a 73-year-old woman, a widow for about twenty years, who lives with one of her children and is retired. She studied only until elementary school because her parents would not allow their daughters to study. Her parents were rigid and with chauvinistic thoughts, had few interpersonal relationships during childhood and adolescence. Similarly, when she married, her husband also had chauvinistic thoughts, not allowing her to study or work, because he said: “a woman's place is in the kitchen, taking care of the house and children” (sic). M. noticed teeth grinding almost thirty [30] years ago. During this period, she broke several of her teeth and also dental mouth guards, even after of implants and three surgeries. In addition, in parallel with SB, nocturnal enuresis and SA appeared.

For nearly 30 years, M. failed to have a good quality of sleep, having an average of three hours in sleeping a day. She was afraid of sleeping and breaking down her teeth due to SB, since this had happened several times. “I was looking for various activities at night so I would not have to go to bed” (sic). “When I fell asleep, around 2am, I woke up between at 4 and 5am and I quickly got off of bed because I could get asleep again” (sic).

M. enjoyed going out with the senior group and spending the weekend at retreats and events. However, episodes of nocturnal enuresis often occurred, thus causing feelings of shame and embarrassment. Due to these episodes, M. quit going out with the group, no longer wanting to sleep out of her home. This situation led her to being more anxious. She said: “I don't know how to handle situations. I feel suffocated” (sic). The patient had a social skills deficit and could not express herself, even when things happened that harmed her. However, M. always wanted to demonstrate that she was strong and could solve all the things that were demanded of her.

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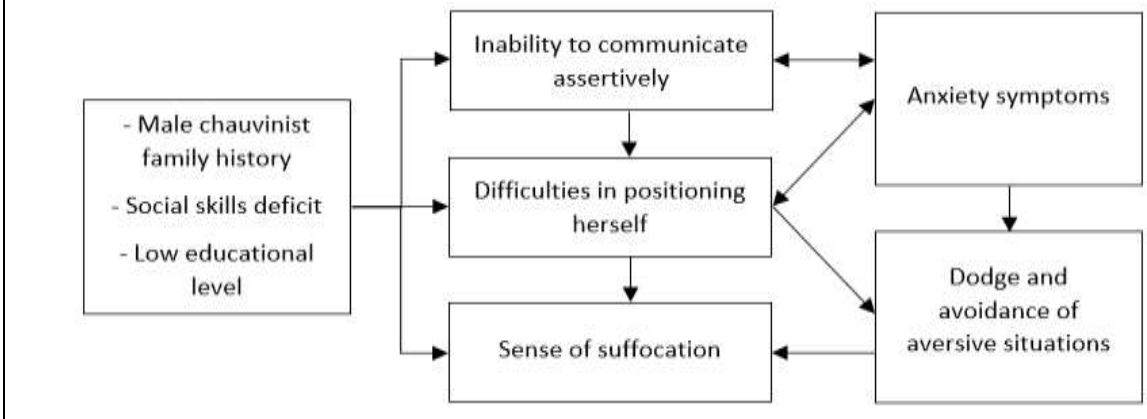
2.6. Conceptualization and Case Information

Cognitive-behavioral conceptualization		
Pacient Identification		
Name: M		Age: 73
Occupation: Housewife		Religious services: No
Marital status: Widow		Dependent number: 1
Education level: Incomplete Elementary School		
Chief complaints		
Sleep bruxism		
Nocturnal enuresis		
Social skills deficit		
Social anxiety		
Cognitive conceptualization		
Relevant history data		
Rigid and male chauvinist parents		
Rigid and male chauvinist husband		
Family problem (alcohol addiction) Low education level		
Beck's cognitive triad		
View of the Self	**View of the World**	**View of the Future**
Unable	Ungrateful	Uncertain
Core beliefs		
"I'm unable"		
"I can't control anything"		
Underlying Assumptions		
"If someone disagree me, that means something wrong with me"		
"If I express what I think, then things may get worse"		
Compensatory/coping strategies		
Overbusy		
Situation	**Situation**	**Situation**
Time to sleep	Keeping in an opened place	Retreat for elderly group
Automatic Thought	**Automatic Thought**	**Automatic Thought**
"I'II broken my teeth again"	"it going to happen something bad"	"I'm going to pee in bed. It won't be a good experience"
Meaning of the AT	**Meaning of the AT**	**Meaning of the AT**
Uncontrol	Jailed	Uncontrol
Emotion	**Emotion**	**Emotion**
Anxiety, Fear	Anxiety	Anxiety, Sadness
Behaviour	**Behaviour**	**Behaviour**
look for task in order to keep herself wake up	Dodge	Avoidance
Reaction	**Reaction**	**Reaction**
Sense of suffocation	Sweating, Sense of suffocation	Palpitation, Sense of suffocation
Diagnostic hypotesis summary		
Trigger situations	Situations in which require positioning	
Predisposing factors	Social skills deficit	
Maintainance factors	Cognitive distortion of Arbitrary Inference	
		
Strengths and resources		
Awareness of problems presented, ease of insights, adherence to psychotherapy and motivation for changing		

Note: Developed by the author.

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2.7. Measures

2.7.1. Questionnaire for Detecting Sleep Bruxism (QDSB) (20, 21) – based on diagnostic criteria of signs and symptoms of International Classification of Sleep Disorders (ICSD) of American Academy of Sleep Medicine (AASM). It consists of the seven items of self-reports. The patient responds yes or no for SB activities awareness. It refers to events during the past 6 months. The patient is classified as suffering from active SB when answering positive to question 1 and / or 2, in addition to at least one positive answer to a symptom listed in question 3.

2.7.2. The Pittsburgh Sleep Quality Index (PSQI) (22) – used for measuring sleep quality during the last month. This questionnaire has been translated and validated into Portuguese. It consists of 19 questions grouped into seven domains. Total score ranges from 0 to 4: good sleep quality; 5 to 10=poor sleep quality; or above 10=sleep disorder.

2.7.3. Perceived Stress Scale (PSS-14) (23) – used for measuring stress level. It has also been translated and validated to Portuguese and consists of 14 questions with scores ranging from 0 to 4 (0=never; 1=almost never; 2=sometimes; 3=almost always, and 4=always). Total scores range from 0 to 56, and higher values suggest higher stress levels.

2.7.4. Beck Anxiety Inventory (BAI) (24) – It consists of 21 items with a Likert scale ranging from 0 to 3 and raw scores ranging from 0 to 63. It was developed in 1988 and a revised manual was published in 1993 with some changes in scoring. The BAI scores are classified as minimal (0 to 7), mild (8 to 15), moderate (16 to 25), and severe anxiety (30 to 63).

2.7.5. Brunel Mood Scale (BRUMS) (25) – The 24-item measures six identifiable mood states (Tension, Depression, Anger, Vigor, Fatigue, and Confusion) through a self-report inventory. The respondents rating a list of adjectives, on a 5-point Likert scale from 0 (not at all) to 4 (extremely), based on how they had been feeling in the previous week, or in the moment of evaluation. The six affective mood states subscales are not diagnostic indicators but refer to sub-clinical psychological mood states.

2.7.6. Daily measures. a) Measurement of SB episodes, nocturnal enuresis. The patient noted the episodes each time they occurred. b) Sleep measurement. Checking hours of daily sleep. The patient noted the time she slept and woke up daily. Based on these reports, the average weekly hours of sleep were obtained.

III. PROCEDURE

With informed consent the patient was assessed in 3 parts - pre, post and 6-month follow-up. The treatment was carried out for 21 CBT sessions of 60 minutes, combined with mindfulness practices. The participant was provided with an app with audio recordings of guided formal mindfulness meditations (body scan meditation and sitting meditations), and she was asked to complete daily in their home formal and informal meditation practices for a long of treatment. The treatment included initial assessment for a long of sessions, psychoeducation about the nature of SA, stress and sleep disorders, orientation to mindfulness (including a discussion of the mind–body connection, why mindfulness is relevant to this case). Thus, the patient was introduced to complete in-session body scan meditation. Subsequent sessions focused on training in other formal mindful meditations (i.e., sitting meditations, mindful walking), and informal practices (i.e., mindful eating, speaking and listening, and mindfulness of daily activities).

DOI: 10.37200/IJPR/V24I5/PR201789
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The participant was encouraged to practice mindfulness in routine daily activities. The main mindful themes covered in sessions included automatic thoughts versus mindfulness, how the untrained mind contributes to suffering, labeling feelings and emotions, responding mindfully to difficult emotions, the stress response, and cultivating awareness of the interconnection between body, emotions, and mind.

3.1. Part 1 – CBT combined with mindfulness practices

Twelve 60-minute sessions of CBT with mindfulness practices were performed. It was settled formal and informal mindfulness daily activities as homework. Besides, from the 9th session onwards the patient received a DTR for homework.

3.1.1. Intervention Protocol

1st session – Rapport, general assessment.

2nd session – Assessment session.

3rd session – CBT and case conceptualization presentation (reading for homework).

4th and 5th sessions – Techniques of identification and e naming of thoughts and emotions, sleep hygiene, psycho education, Mindfulness.

6th session – Social skills, strengthens, resource and obstacles, Mindfulness.

7th and 8th sessions – Roleplaying, sleep hygiene, Mindfulness (reading for homework).

*9th and 10th session*s– Identification of cognitive distortions, DTR, mindfulness.

11th session – Solving problems training, advantages e disadvantages and action plan, Pursuit of evidences (DTR) and Mindfulness (action plan for homework).

12th session – Relapse prevention, Mindfulness.

3.2. Part 2 – Social skills training and Relapse Prevention

In the second part, 9 60-minute sessions were conducted focusing on social skills training, relapse prevention and Mindfulness practices.

3.2.1. Intervention Protocol

1st session — Verbal and non-verbal communication verbal, Role-playing, Mindfulness.

2nd and 3rd sessions – Assertiveness, Role-playing, Mindfulness.

4th and 5th sessions – Assertiveness, Role-playing, Mindfulness.

6th and 7th sessions – Empathy and Civility, Role-playing, Mindfulness.

8th session – Problem-Solving Skills Training, making decision, Mindfulness.

9th session – Relapse prevention, Mindfulness.

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3.3. Session Structure (60') Step by Step

a) Do a mood check and obtaining an update – 3' (Using scale – 0 to 10); b) Set the agenda – 2'; c) Review homework – 3' (daily notes for SB episodes, nocturnal enuresis and hours sleeping); d) Mindfulness practices – 10'; e) Prioritize the agenda – 35' (in collaboration – therapist/patient); f) Set homework assignment – 2'; g) Provide a session summary and elicit feedback – 5'.

IV. RESULTS

4.1. Treatment Evolution

The results presented in Tables 1, 2 and 3 (episodes of SB and nocturnal enuresis, hours of sleep – in the other words - time that slept and woke up) were based on the reports and daily filling of reports by the patient.

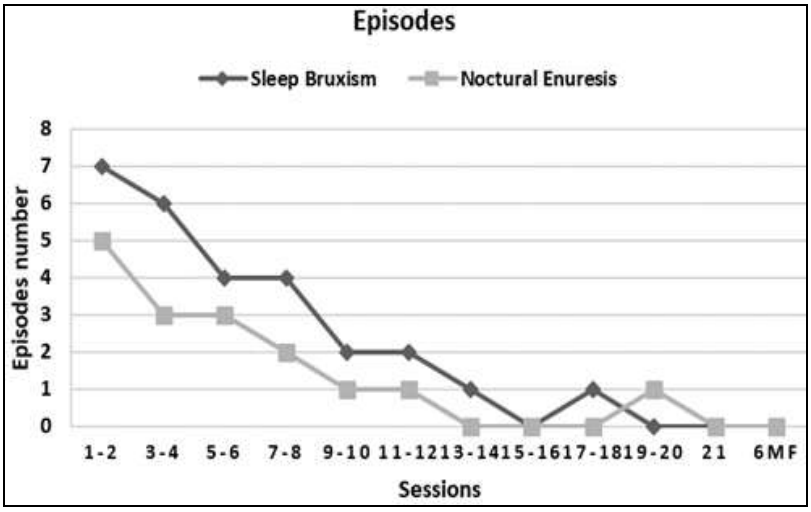

Figure 1: Ratios of Mean Weekly According to Daily Report of Patient

Figure 1 shows a considerable decrease in both SB and nocturnal enuresis episodes between Part 1 and 2 of treatment. Six months after the patient reported that she had no episode of both.

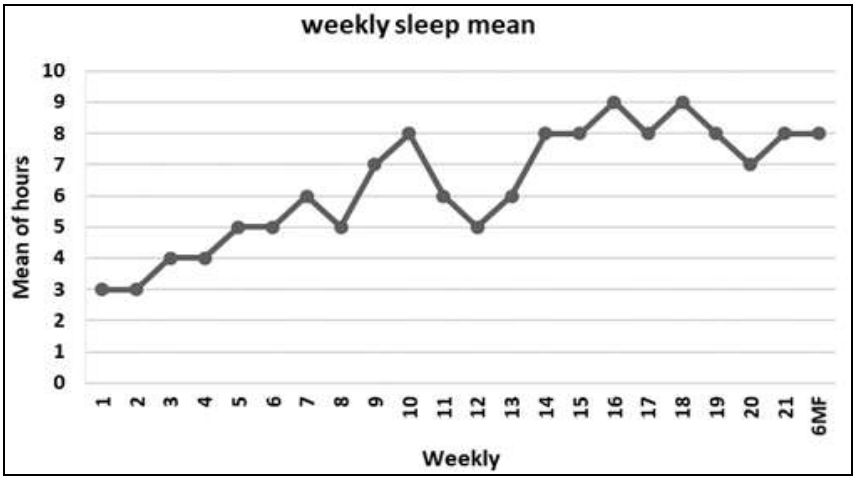

Figure 2: Mean of Weekly Sleep Time, According to Daily Report of Patient

DOI: 10.37200/IJPR/V24I5/PR201789
Received: 13 Feb 2020 | Revised: 07 Mar 2020 | Accepted: 23 Mar 2020

Concerning the number of hours of sleep (Figure 2), the patient had an improvement that reached 8 hours of sleep in weekly average, taking in account assessment for throughout treatment. Furthermore, it remained at this average six months after treatment.

4.2. Pre, Post and 6-month Follow-up Assessment

The patient was assessed in three times (pre, post, and 6-month follow-up) for SB symptoms, sleep quality, stress, anxiety, and humor levels.

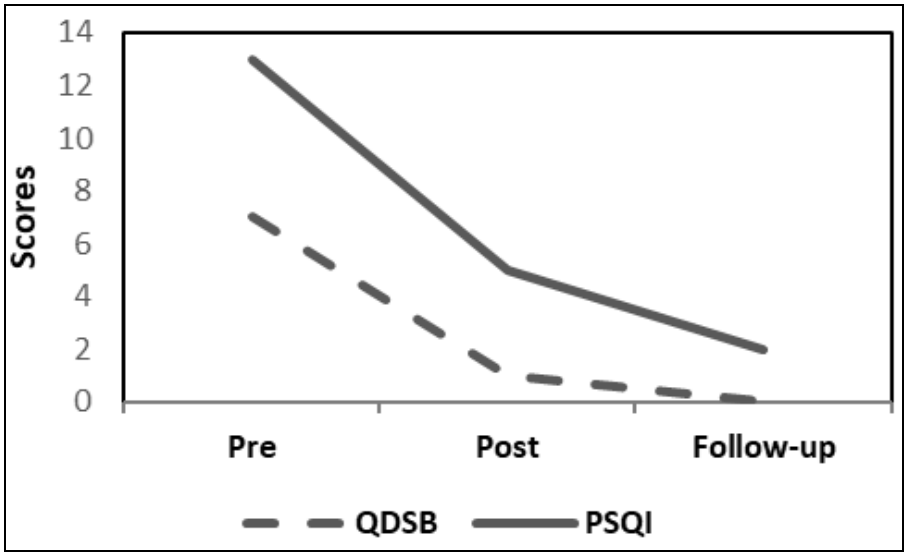

Figure 3: Ratios of Scores of SB and Quality Sleep in the Pre, Post, and 6-Months Follow-up

Figure 3 presents the SB scores based on the diagnostic criteria of signs and symptoms of ICSD of AASM and the measure of sleep quality. The improvement was significant for both cases, comparing pre and post intervention. The 6-mouth follow-up assessment both continued with a trend towards improvement.

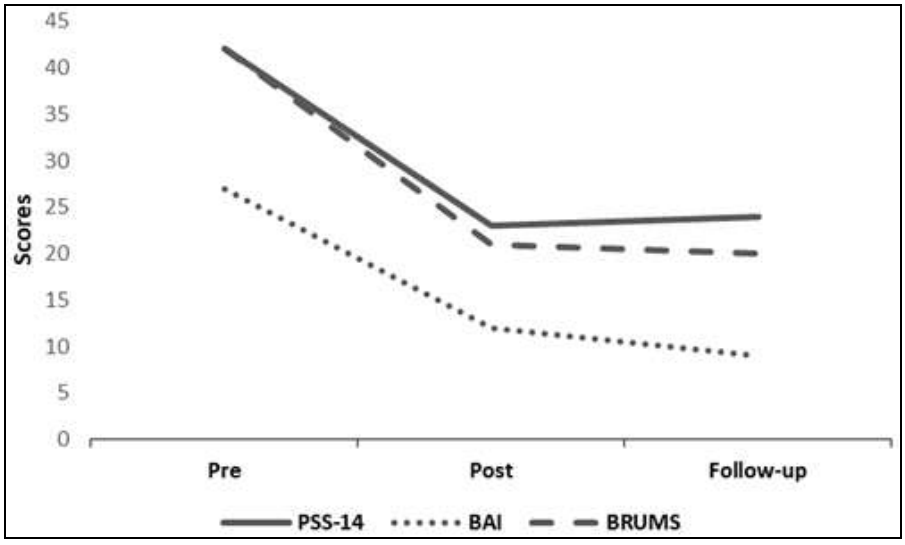

Figure 4: Ratios of Scores of Stress, Anxiety, and Humor in the Pre, Post, and 6-Months Follow-up

DOI: 10.37200/IJPR/V24I5/PR201789
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Regarding symptoms of stress, anxiety and mood, the patient also showed (see Figure 4) significant drop in stress and anxiety levels and improved mood. When assessed at follow-up, stress and anxiety levels remained and mood levels improved slightly.

V. DISCUSSION

The purpose of this study was to describe the case of an elderly woman with severe SB and SA treated with CBT combined with mindfulness. Patient M was assessed in pre, post and 6-mouth follow-up for SB, anxiety and stress symptoms and also quality of sleep and humor levels. Thus, it was noted the efficacy of treatment and the impact in patient's quality of life. Results indicated that SB symptoms (see Figure 3) followed results of improvement in anxiety and, in parallel, her humor also improved in appraisement for the three times of this study (see Figure 4). In a Systematic review and meta-analysis of Meditation Programs for Psychological Stress and Well-being effect sizes were significant for improvements in stress, anxiety, humor and quality of sleep (26). A randomized trial study evaluated the efficacy of mindfulness-based interventions for SA. It was conducted the first comparative trial of Mindfulness-Based Stress Reduction versus group CBT for SA. Results disclosed similar findings for reducing symptoms of SA and in improving mood and quality of life (27).

In this study, only the stress appraisement remained the same in the six months before treatment, although it has been significantly reduced in the post assessment, when compared to pre assessment. This finding also suggest improvement in patient sleep (compare Figure 1 to 4). These results corroborate with literature once CBT has been an efficacious treatment for anxiety (28, 29) and may be associated with moderate improvements in sleep over the course of treatment for numerous anxieties related to different conditions associated with sleep difficulties (4, 8, 9, 11, 29). Poor sleep is common and prevalent in anxiety disorders such as SA (11). Besides, daily Mindfulness practices may influence in sleep quality, anxiety and stress improvement. This evaluation of mindfulness interventions, in general has been positive (13, 14). Likewise, the etiology of bruxism is multifactorial. Thus, occlusion abnormalities, chronic stress, and mental disorders may be responsible for this condition (2, 5).

The patient showed there was severe impairment in her quality of life before the treatment, because she has deficit in social skills and M. felt herself unable to develop it. The social skills and problem-solving training showed itself beneficial for her, once she reported using coping strategies for different social situations and was able to feel better.

During the treatment, the patient resumed the meetings in the seniors retreat and did not present any nocturnal enuresis episodes. However, M. returned gradually. Firstly, she spent only one morning with the group, then spent the whole day, until she was able to spend a day and a night and finally, two full days with the group. This change had an impact on her quality of life and well-being. Furthermore, reduced stress and anxiety symptoms and, consequently, SB symptoms (3, 6). At the beginning of the treatment, the patient believed that she could not get off the situation she was in, unable to do anything for herself. However, there were considerable evolution in her thoughts, feeling and acting way.

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Whenever the patient had a commitment, or was experiencing stress, she had SB and nocturnal enuresis episodes. Thus, she woke up with severe pain throughout her body. With the improvement of social skills through training, the patient found that levels of anxiety, stress and quality of life improved as well. The subjective measures, such as daily sleep diaries in this treatment sessions, was important to show more informative or pertinent findings to the questions of the current study.

These findings perhaps indicate a relation between SA and SB and consequently, improvement in sleep quality and humor levels. Another important point was even at 73 years old and lower education level, the patient showed ability for insights and due understanding throughout the treatment. This suggests that social skills development and taking advantage of treatment are not directly linked to age or educational level.

VI. CONCLUSION

This study demonstrated that the CBT combined with mindfulness practices intervention was effective for treating an elderly woman with SB and SA. It reduced the symptoms and improved stress and humor levels and sleep quality. Our study had a few limitations that should be noted. Although there were improvements in sleep quality in this study over the course of treatment, our findings suggest that these changes do not necessarily predict improvement in SA symptoms or vice-versa. There is greater need for further accurate investigation. On the other hand, CBTs such as psychotherapy, physical exercise and lifestyle changes, which are aimed at stress and anxiety reduction, may be auxiliary in the treatment of SB.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

VII. FINDING

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Brazil. Finance Code 001.

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DOI: 10.37200/IJPR/V24I5/PR201789
Received: 13 Feb 2020 | Revised: 07 Mar 2020 | Accepted: 23 Mar 2020