Group climate in the voice therapy of patients with Parkinson's Disease

Clima de grupo na terapia vocal de pacientes com Doença de Parkinson

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ABSTRACT

Purpose: To verify the impact that group dynamics and coaching strategies have on the PD patients voice, speech and communication, as well as the group climate. **Methods**: 16 individuals with mild to moderate dysarthria due to the PD were divided into two groups: the CG (8 patients), submitted to traditional therapy with 12 regular therapy sessions plus 4 additional support sessions; and the EG (8 patients), submitted to traditional therapy with 12 regular therapy sessions plus 4 sessions with group dynamics and coaching strategies. The Living with Dysarthria questionnaire (LwD), the self-evaluation of voice, speech and communication, and the perceptual-auditory analysis of the vocal quality were assess in 3 moments: pre-traditional therapy (pre); post-traditional therapy (post 1); and post support sessions/coaching strategies (post 2); in post 1 and post 2 moments, the Group Climate Questionnaire (GCQ) was also applied. **Results**: CG and EG showed an improvement in the LwD from pre to post 1 and post 2 moments. Voice self-evaluation was better for the EG - when pre was compared with post 2 and when post 1 was compared with post 2 - ranging from regular to very good; both groups presented improvement in the communication self-evaluation. The perceptual-auditory evaluation of the vocal quality was better for the EG in the post 1 moment. No difference was found for the GCQ; however, the EG presented lower avoidance scores in post 2. **Conclusion**: All patients showed improvement in the voice, speech and communication self-evaluation; EG showed lower avoidance scores, creating a more collaborative and propitious environment for speech therapy.

RESUMO

Objetivo: Verificar impacto de estratégias de *coaching* e de dinâmica dos grupos na voz, fala, comunicação e clima do grupo de pacientes com DP. **Método**: Participaram 16 indivíduos com disartria leve a moderada por DP, divididos em: GC (8 pacientes), terapia tradicional (12 sessões mais 4 de reforço), e GE (8 pacientes), terapia tradicional (12 sessões) acrescida de 4 sessões de estratégias de *coaching* de dinâmica dos grupos. Foi aplicado questionário Vivendo com Disartria - VcD, além de autoavaliação da voz, fala e comunicação e análise perceptivo-auditiva da voz, nos momentos: pré-terapia, pós-terapia tradicional (pós 1) e pós-reforço/estratégias de *coaching* (pós 2); no pós 1 e 2 foi aplicado o Questionário Clima de Grupo - QCG. **Resultados**: GC e GE apresentaram melhores escores do VcD, comparando pré com pós 1 e pós 2. A autoavaliação da voz foi melhor no GE, comparando pré com pós 2 e pós 1 com pós 2, de regular para muito boa; ambos apresentaram melhora na autoavaliação da comunicação. A análise perceptivo-auditiva foi diferente entre os grupos no pós 1, com vozes melhores no GE. Sem diferença em QCG; contudo, GE apresentou menor evitação no pós 2. **Conclusão**: Pacientes apresentaram melhor autoavaliação da voz, fala e comunicação nas duas modalidades de terapia; GE mostrou redução na evitação, tornando o ambiente mais colaborativo e propício para a terapia fonoaudiológica.

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INTRODUCTION

The Parkinson's disease (PD) is a neurodegenerative disease that affects the production of dopamine, a neurotransmitter that is produced in the substantia nigra. It is the second most frequent neurodegenerative disease[1]. The PD manifestation may include: tremors, bradykinesia and muscle stiffness[1,2]. It is noteworthy that these symptoms also impact the voice expression. The Parkinsonian voice presents a slow and imprecise speech with unstable emission and reduced loudness due to the decreased glottal closure and reduced speech amplitude[3,4].

These vocal characteristics, along with the neuropsychiatric symptoms that are frequently reported by the PD patient's, results in activities limitations and restrictions, especially in the social environment. Therefore, studies deeply investigate the relationship between these activities limitations and restrictions, along with the quality of life and the PD patients' self-perception of their own limitations[1,2]. In order to guarantee a better knowledge of how these individuals face their problem and what aspects may help them overcome it, it is essential to understand the patient's behavior on their daily difficulties and their restrictions due to the disease.

The vocal therapy has been efficient to minimize the vocal symptoms of the PD, by improving the vocal quality emission and providing a more effective communication[3,5]. Group voice therapy for patients with similar problems is indicated in order to improve interaction between the participants and also to improve their mood[6]. This type of intervention has been applied in cases of PD and it has contributed for the treatment effectiveness[7].

The field of Psychology has extensively studied group therapy; and came to understand that this environment promotes interactions between each member with themselves, between the group members and between the group and the therapist. These group experience interactions results in personal development, symptoms relief and corrective experiences that will help to improve and to maintain the new pattern[7]. Therefore, the group therapy is used for many types of diseases rehabilitations such as psychological and/or psychiatric[8,9], nicotine dependency[9] and also for speech-language pathology[10-12].

The group therapy may be chosen as a clinical approach either due to a clinical choice or due to the need to handle a high clinical demand. In both situations, great part of the therapeutic group therapy success is the group climate (GC)[7]. The GC has a direct impact on the relationships established during the therapy and on the perception of the therapeutic group environment itself. Law et al. (2012)[6] proposal claims that the GC can be verified by three behaviors: engagement, which means the positive working environment in the group; avoidance, ie, personal responsibilities avoidance to perform their role in the group; and conflict, feelings of anger and tension among the group members[6].

On the other hand, group dynamics strategies have been used as a tool to promote self-knowledge, assisting on the therapeutic process in an individual matter. In addition, it is a tool for the development of intrinsic and extrinsic motivation and to strengthen relationships among the group members[13], which benefits the GC. Thus, a greater acceptance of the diagnosis and

better self-regulation are expected in order to acquire a more effective communication pattern.

Objective

To verify the impact that group dynamics and coaching strategies have on the: self-perception of voice, speech and communication; voice perceptual-auditory analysis and group climate of patients with PD.

METHODS

This is a prospective and longitudinal research that was approved by the Ethics Committee under the protocol number 1.019.900.

A total of 35 subjects were evaluated; aged between 29-80 years old (mean age of 65.4 years old), with PD diagnosis according to the Brainstem Bank of the UK Parkinson Society Criteria[14] and between stages 2 and 3 of the Hoehn & Yahr Scale[15]. These patients had mild to moderate dysarthria according to the Duffy Scale[16], were on stable medication regimens and were referred for speech therapy at the Brazilian Parkinson Association - *Associação Brasil Parkinson* (ABP) - in the Speech-Language Pathology Department, State of São Paulo. All patients signed an informed consent form.

Patients with other neurological diseases besides PD, and patients who received complementary diagnosis in the otorhinolaryngological evaluation - establishing other physiological bases for the voice problem in addition to the symptoms of the PD - were excluded from the sample. Individuals with cognitive level below normal according to the IQCODE (Informant Questionnaire on Cognitive Decline in the Elderly)[17] and with a poor understanding of the activities and the tests applied were also excluded.

The IQCODE has 26 questions that were answered by an informant or a family member. The informant or family member had to compare the patient to his self 10 years ago in situations regarding the use of memory or intelligence, rating if the patient had improved, stayed the same or got worse in a scale from 1 to 5 were: 1 = "much improved"; 2 = "a bit improved"; 3 = "not much change"; 4 = "a bit worse" and 5 = "much worse".

The average was used to calculate the score and the data were analyzed according to the IQCODE validation[17], considering 3.3 points as the cutoff score. Therefore, patients with scores above 3.3 were excluded from the final sample.

The final sample counted with 20 subjects divided into two groups: Control Group – CG –, with mean age of 73.5 ± 5.07 years old, Hoehn & Yahr scale mean score of 2.7 ± 0.3 and IQCODE mean score of $2,78 \pm 0,44$; and the Experimental Group – EG – with mean age of 57.3 ± 16.7 years old, Hoehn & Yahr scale mean score of 1.5 ± 0.5 and IQCODE mean score of $2,85 \pm 0,69$. These ages and scores reforces homogeneous and comparable samples (Table 1).

Four patients, that is, 20% of the total sample, abandoned the treatment. Thus, the remaining 16 patients were evaluated by a speech-language pathologist in three different moments:

pre-traditional therapy (pre), post-traditional therapy (post 1) and post support sessions/coaching strategies (post 2).

In the initial evaluation, the pre moment, a simple case history was taken. In the three different moments - pre, post 1 and post 2 - the Living with Dysarthria Questionnaire (LwD)[17] and the self-evaluation of voice, speech and communication were applied, also the voice recording for the perceptual-auditory analysis was preformed. The group climate evaluation occurred in two different moments - post 1 and post 2 - (Figure 1).

The case history was obtained by an interview with the participants. The patient and/or informant were asked for information such as: full name, age, telephone number, patient complaint and its duration, date of the PD diagnosis, name of the responsible neurologist and medication in use.

To assess the self-evaluation of voice and communication, each participant answered to two questions in a scale from 1 to 5: "What do you think about your voice?" and "What do you think about your communication?"; considering that: 1 = "very bad"; 2 = "bad"; 3 = "reasonable"; 4 = "good" and 5 = "very good".

The Brazilian Portuguese version of the Living with Dysarthria Questionnaire (LwD) - *Vivendo com Disartria* (VcD) – was used to self-evaluated the difficulties of speech and communication in individuals with dysarthria. The Brazilian version of the protocol was translated by Puhl, Diaféria, Padovani and Behlau[18], based on its original version, Living with Dysarthria[19], developed by the Vårdal Institute.

The LwD has 50 questions equally divided into 10 sections: Section 1 – "Communication problems related primarily to

Table 1. Control Group and Experimental Group demographic data

	CONTROL GROUP	EXPERIMENTAL GROUP	P-VALUE
Age	73.5 ± 5.1	57.3 ± 16.7	0.035
H & Y Scale	2.7 ± 0.3	2.0 ± 0	0.32
Dysarthria	1.7 ± 0.4	1.5 ± 0.5	0.43
IQCODE	2.78 ± 0.4	2.85 ± 0.7	0.35

T-Student test
Caption: H & Y Scale = Hoehn & Yahr; IQCODE = Informant Questionnaire on Cognitive Decline in the Elderly
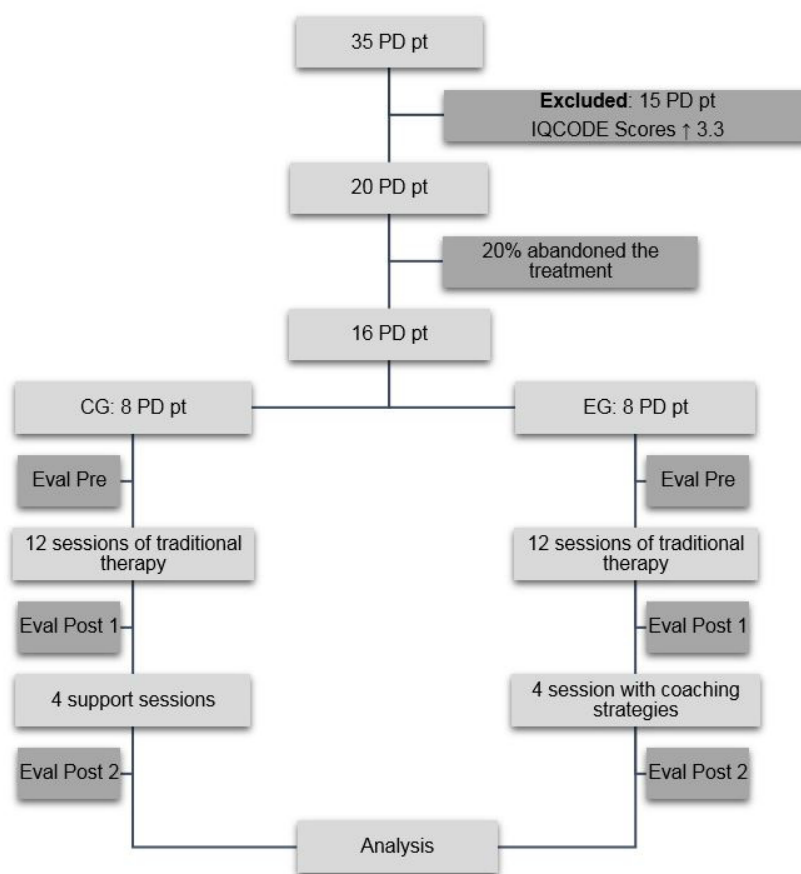
Caption: pt = patient; PD = Parkinson Disease; CG = Control Group; EG = Experimental Group; Eval Pre = Evaluation at the pre-traditional therapy moment; Eval Post 1 = Evaluation at the post-traditional therapy moment; Eval Post 2 = Evaluation at the post support sessions/coaching strategies moment
Figure 1. Methodology Flowchart

speech"; Section 2 – "Communication problems related primarily to language/cognition"; Section 3 – "Communication problems related primarily to fatigue"; Section 4 – "Effects of emotion"; Section 5 – "Effects of different persons"; Section 6 – "Effects of different situations"; Section 7 – "My difficulties in communicating affect my possibilities to..."; Section 8 – "What do you think contributes to the changes in the way you communicate?"; Section 9 – "Communicating like I would want to:" and Section 10 – "How do you perceive changes and the possibility to alter your way of speaking".

To answer the questionnaire the patient had to rate each item in a scale from 1 to 6 were: 1 = "definitely false"; 2 = "mostly false"; 3 = "partly false"; 4 = "sometimes true"; 5 = "mostly true" and 6 = "definitely true".

For the data computation, the scale was translated to numbers from 0 to 5. The total score and the average score for each one of the 10 sections were calculated. The data analysis was based on the Hartelius et al.[19], study.

For the voice recording, the participants were seated in a comfortable chair, in a straight position and head parallel to the Frankfurt horizontal plane. A unidirectional, condenser-connected head-microphone (model: Karsect HT-9, Guangdong) connected to an external USB-SA 2.0 sound card (Andrea, PureAudio™, Pleasant Grove-UT) was used to reduce the noise and any compatibility issues. The microphone was at a distance of 5cm from the mouth, with a 45° deviation from the midline, determined by the lips. All tasks were recorded and stored by the VoxMetria 4 Ink Program (CTS *Informática*), installed on an HP Pavilion Ultrabook™ 14 computer.

The voice recording was performed at the three moments: pre; post 1 and post 2. The voice sample was the sustained vowel /a/. Two voice specialist speech- language pathologists performed the perceptual-auditory analysis of the vocal quality for all patients in the three different recording moments. Also, 10% of random repetition was added to verify intra and interrater reliability. Each patient had three recordings, corresponding to the three different evaluation moments; therefore, there was a total of 16 sets with three recordings in each. The sets and the different recording moments for each patient were randomly distributed. The judges had no information of the patient history or of which recording moment. The perceptual-auditory task was to indicate the "best voice" of each set.

Finally, the Group Climate Questionnaire - Short Form, elaborated by Mackenzie (1983), in Law et al.[6], was applied to evaluate the group climate regarding to aspects of engagement, avoidance and conflict among the group members. The self-assessment questionnaire has 12 questions: five related to engagement, three to avoidance, and four to conflict. For each question, the participant had to score from 0 to 6, being 0 = "not at all" and 6 = "extremely".

Experiment

The patients were randomly divided into two groups: the control group (CG), submitted to traditional therapy and the experimental group (EG), submitted to traditional therapy plus group dynamics and coaching strategies. There were 8 participants in each group. Both groups were submitted to the speech-language pathology therapy twice a week, for eight weeks, total of 16 sessions. The CG had 12 sessions of traditional therapy plus 4 reinforcement sessions, while the EG had 12 sessions of traditional therapy plus 4 sessions with group dynamics and coaching strategies.

At session 1 (pre moment), the patients underwent case history, speech-language pathology evaluation, voice recording and were imparted about the therapeutic process, vocal health habits and the impact that the PD has on the voice. At session 11, (post 1 moment), the patients underwent a re-evaluation, including the second vocal recording; this re-evaluation was preformed before the beginning of the reinforcement sessions and the group dynamics and coaching strategies. At the last day (post 2 moment), again the patients were re-evaluated and the third recording was preformed. Two-experienced speech-language pathologist conducted the sessions. In order to avoid any influence in the results due to the different therapeutic style of each clinician, the therapists took turns to conduct the groups. The sessions happened at the same moment, therefore, the therapists never attended the same group simultaneously.

Both CG and EG were submitted to the routine speech therapy intervention program of the ABP. The program has a total of 10 sessions, with 45 minutes each. It relies on a physiological approach, mainly with the use of vocal effort techniques and speech monitoring skills, aiming the glottis closure improvement without supraglottic interference. Some of the exercises used were: hard glottal attack on vowels and words; maximum phonation time in sustained vowels and automatic speech tasks; frequency and intensity variation associated with maximum phonation time; vocal projection; articulatory sequences and reading passages. Individual difficulties regarding the voice and the communication were addressed to the group, therefore, all the group members would engage to develop the communication awareness and an easy way to perform the strategies, especially for the EG.

From the 12th until the 18th session, the last session, the CG patients kept on with the traditional approach for PD patients. At the same time, the EG, besides being submitted to the same traditional intervention, was also submitted to group dynamics and coaching strategies. These strategies were elaborated and applied by two voice specialists, coaches and postgraduates in Group Dynamics by the Brazilian Society of Group Dynamics - *Sociedade Brasileira de Dinâmica de Grupos* (SBDG). The aim was to propitiate self-knowledge and self-development while also improving self-esteem and discussing coping strategies for the disease. This specific work was carried out during four sessions (sessions: 12, 14, 16 and 18), given once a week, with 45 minutes each (Chart 1).

Data analysis

Data were analyzed using the software: SPSS v.17, Minitab 16 and Excel Office 2010. Non-parametric tests were used due to the small sample size (less than 30 individuals). A significance level of 0.05 (5%) was considered and confidence intervals were stated with 95% statistical confidence.

Most of the analysis used the Friedman Test, the Wilcoxon Test and/or the Mann-Whitney Test. The Friedman Test was

used to compare the three different evaluation moments for each group; the Wilcoxon Test was used to compare in pairs the different moments of the evaluation (pre with post 1; pre with post 2; post 1 with post 2); and the Mann-Whitney Test was used to compare both groups, CG with EG.

The Cohen Kappa coefficient analysis, used to verify inter- and intra-rater reliability for the perceptual-auditory analysis, presented excellent values for all analyses (Kappa = 1,000 and p = 0.025). The Equality of Two Proportions Test was used to compare the group's distribution for the perceptual-auditory analysis; its calculation was based on both evaluators' responses, therefore, 16 answers were analyzed for each group.

RESULTS

Regarding the self-evaluation of voice: there was a significant difference between the EG responses, both in the whole therapeutic process (p = 0.006) and between the pre and the post 2 moments (p = 0.023) and also between the post 1 and the post 2 moments (p = 0.011); for the CG, no difference was found between the three evaluation moments (Table 2).

Regarding the self-evaluation of the communication: a significant difference was found in both groups (CG: p = 0.019; EG: p = 0.048) on the entire therapeutic process (Table 2); the analyses in each moment, showed difference between the post

Chart 1. Description of the group dynamics and coaching strategies applied for the Experimental group at the last 4 therapy sessions

GROUP DYNAMICS			
SESSION	DYNAMICS	DURATION	OBJECTIVE AND STRATEGIES
1st	PERSONAL PRESENTATION	15 min	Encourage the personal presentation of the group members' and the group leaders/therapists by choosing an object that would represent the individual expectations for the further group work.
	CHALLENGES	30 min	Work to overcome challenges that occurred in the childhood, youth or adulthood life in order to strengthen the self-esteem and share moments of victory with the group. Coping work strategies.
2nd	DAILY UPDATE	15 min	Redeem the insights that occurred during the past week after the first session.
	SELF-FEEDBACK	30 min	To identify positive, negative and knew behaviors that allowed improvement in the quality of life. These behaviors were presented out loud so that the group could validate, or not, the perception of each one.
3rd	DAILY UPDATE	15 min	Redeem the insights that occurred during the past week.
	DESCRIPTION OF PERSONALITIES	30 min	To provide a moment of communication among the group members, in order to reinforce the new vocal pattern learned in the vocal therapy; also to evaluate aspects of communication, memory and linguistic. Work in partnership (2 persons): description of a known person previously defined and written on a paper on the patients back so that the other person would guess the chosen personality.
4th	DAILY UPDATE	15 min	Redeem the insights that occurred during the past week.
	AFFECTION	30 min	Manifestation of affection while sharing a box of chocolates.

Table 2. Self-evaluation of voice, speech and communication and the LwD results for the Control group and the Experimental group

Evaluation		Moment	Mean	Median	Standard Deviation	N	P-value		
							Pre	Post 1	Three Moments
Voice Self-evaluation	CG	Pre	2.88	3	0.83	8	-	-	
		Post 1	2.75	3	0.89	8	0.564	-	0.589
		Post 2	3.25	3	1.28	8	0.48	0.194	
	EG	Pre	3	3	0.93	8	-	-	
		Post 1	3	3	0.76	8	1	-	0.006
		Post 2	4	4	0.53	8	0.023	0.011	
Communication Self-evaluation	CG	Pre	2.88	2.5	1.13	8	-	-	
		Post 1	2.88	3	0.83	8	1	-	0.019
		Post 2	3.75	3.5	0.89	8	0.053	0.02	
	EG	Pre	3.13	3.5	0.99	8	-	-	
		Post 1	3.75	3.5	0.89	8	0.096	-	0.048
		Post 2	4.13	4	0.64	8	0.039	0.257	
LwD	CG	Pre	2.32	2.56	0.94	8	-	-	
		Post 1	3.57	3.75	1.14	8	0.012	-	0.005
		Post 2	3.17	3.24	1.12	8	0.03	0.263	
	EG	Pre	1.98	2.03	1.1	8	-	-	
		Post 1	2.93	3.26	1.1	8	0.036	-	0.093
		Post 2	2.84	2.69	1.04	8	0.017	0.575	

Friedman Test and Wilcoxon Test
Caption: N = Sample Size; LwD = Living with dysarthria questionnaire; CG = Control Group; EG = Experimental Group; Pre = pre-traditional therapy; Post 1 = post-traditional therapy; Post 2 = post support sessions/coaching strategies

Table 3. Perceptual-auditory analysis of the best voice moment

Perceptual-Auditory Analysis	CG		EG		P-value
	N	%	N	%	
Pre	3	18.80%	1	6.30%	0.285
Post 1	5	31.30%	11	68.80%	0.034
Post 2	8	50.00%	4	25.00%	0.144

Equality of Two Proportions Test
Caption: N = Sample Size; % = percentage; CG = Control Group; EG = Experimental Group; Pre = pre-traditional therapy; Post 1 = post-traditional therapy; Post 2 = post support sessions/coaching strategies

Table 4. Group Climate analysis for the Control group and the Experimental group in the pre, post 1 and post 2 moments

Group Climate		Moment	Mean	Median	Standard Deviation	N	CI	P-value		
								Pre	Post 1	Three Moments
Engagement	CG	Pre	2.53	2.4	1.26	8	0.87	-	-	
		Post 1	2.98	3	1.38	8	0.95	0.446	-	0.648
		Post 2	2.9	2.9	1.14	8	0.79	0.497	0.779	
	EG	Pre	2.95	3.1	1.11	8	0.77	-	-	
		Post 1	2.98	2.5	1.4	8	0.97	0.932	-	0.657
		Post 2	3.25	3.2	0.48	8	0.33	0.484	0.624	
Avoidance	CG	Pre	2.75	2.5	1.28	8	0.89	-	-	
		Post 1	3.04	2.83	1.39	8	0.96	0.136	-	0.657
		Post 2	2.67	2.67	1.37	8	0.95	0.799	0.526	
	EG	Pre	2.83	3.17	1.14	8	0.79	-	-	
		Post 1	2	2.17	1.1	8	0.76	0.128	-	0.166
		Post 2	1.96	2.17	0.58	8	0.4	0.028	0.799	
Conflict	CG	Pre	0.97	1	0.49	8	0.34	-	-	
		Post 1	0.91	0.63	1.06	8	0.73	0.888	-	0.587
		Post 2	0.78	0.75	0.77	8	0.54	0.528	0.753	
	EG	Pre	0.78	0.63	0.59	8	0.41	-	-	
		Post 1	0.59	0.5	0.53	8	0.37	0.528	-	0.066
		Post 2	0.44	0.13	0.56	8	0.39	0.091	0.344	

Friedman Test and Wilcoxon Test
Caption: N = Sample Size; CI = Confidence Interval; CG = Control Group; EG = Experimental Group; Pre = pre-traditional therapy; Post 1 = post-traditional therapy; Post 2 = post support sessions/coaching strategies

1 and the post 2 moments (p = 0.020) for the CG, and between the pre and the post 2 moments (p = 0.039) for the EG. The LwD questionnaire for the whole therapeutic process presented difference only for the CG (p = 0.005). However, both groups presented differences between the pre and the post 1 moments (GC: p = 0.012, GE: p = 0.036) and between the pre and the post 2 moments (GC: p = 0.030, GE: p = 0.017).

The voices of the EG were significantly better at the post 1 moment (p = 0.034), as shown in Table 3, that compares the voice perceptual-auditory analysis between both groups, CG with EG, at all three moments.

Finally, no statistical differences between both groups were found for the Group Climate analysis (Table 4). However, the EG presented a lower avoidance in the post 2 when compared to the pre moment (p = 0.028).

DISCUSSION

The demand for speech-language pathology therapy has increased, therefore, group therapy became necessary and convenient[2,18,20], both to meet the main needs of the patients, in cases of PD[19], and also to support some of their emotional aspects[2]. Currently, many speech therapies are performed in a group, and they are based on a physiological approach for voice treatment, that includes vocal effort techniques and speech monitoring skills. This traditional therapy program has vocal exercises that are based on the vocal signs and symptoms description and on communication difficulties[20]. Also, others symptoms and individual variations are considered[2].

The group environment plays an important role for interpersonal relationships[6,20]. It also interacts with the engagement, avoidance and conflict that are responsible for changes in the group climate[6,9]. It has been proven that during the therapeutic process, the engagement aspect increases[6,9] and assist for the reduction of psychiatric symptoms, such as mood disorders and interpersonal problems[21,22]. In addition, it establishes bonds of trust among the group members and promotes a collaborative environment[22]. Also, the group helps to decrease avoidance and conflict[9] by reducing the anxiety[21] and the feelings of distress[22], what guarantees a better therapeutic result.

It is believed that group dynamics and coaching strategies promote a greater self-knowledge, self-development and interaction among the group members, and, moreover, awakens the self-motivation. Thus, voice, speech and communication

self-perception may improve; therefore, a better performance and more accurate results are gain after the voice therapy.

The present study made attempts to keep similar groups in order to make them comparable, such as: controlling the disease severeness of the selected patients and by randomly selecting the participants for each study group. Even though, both groups presented different outcomes, as it was expected.

Both groups showed positive results after the speech-language pathology intervention, what reinforces the positive aspects of the group environment for a better therapy performance[5,23]. Considering that many analyses showed tendency to statistical difference, probably the positive effects of the therapy would have been even greater with a larger sample size. The type of intervention showed some differences that will be discussed next.

Patients in both groups self-evaluated their communication has better at the end of the intervention. Nevertheless, it is noteworthy that differences in the EG occurred between the pre and the post 2 moments; while for the CG, the highest difference was between the post 1 and the post 2 moments. Therefore, it can be inferred that the communication self-evaluation improvement was independent of the type of strategy used and that the EG evaluated their voice as better after submitted to group dynamics and coaching strategies (Table 2).

However, the real understanding of the self-evaluation question cannot be guaranteed, especially considering the unclear difference between voice and communication for laymen. Also, the greatest concern of patients with PD is not usually their voice and/or speech, but rather how these changes affect their self-concept and their participation in family and social activities[24].

Taking into account this information, the LwD questionnaire was applied in order to identify how patients with dysarthria notice themselves, their difficulties of speech and how they handle situations[19]. The LwD is considered to be a more complex tool for the self-evaluation than the one presented previously. As mentioned, both groups presented differences when pre-traditional therapy was compared, both with, the post 1 and with the post 2 moments (Table 2). This finding indicates that the therapeutic process itself is critical to improve the communication self-perception, apart of the type of intervention.

To verify in a more direct way the vocal changes perceived by the patients, two-voice specialists speech-language pathologist preformed a perceptual-auditory analysis of the voices. The CG patients had better voices at the post 2 moment, while the EG had better voices at the post 1 moment (Table 3).

The CG focused specifically at vocal activities during the entire therapeutic process; these activities aimed to guarantee a louder loudness, a greater vocal flexibility and a better articulation of speech sounds. On the other hand, after the 12th session the EG also focused on discussions related to group dynamics and coaching strategies. Although the traditional treatment was not left aside, these discussions might have turned the patients' attention to some emotional aspects.

The complementary treatment that was proposed in this research - with group dynamics and coaching strategies – reduced the feelings of anxiety[21], of distress[22] and gave more self-confidence[25], which favored the aspects that were evaluated in the group climate. Taking into account that the voice is shaped by individual aspects and by the environment where the communication takes place[26], it is possible that these conditions promoted a better self-evaluation of the voice.

The goal of the coaching strategies was to strengthen the relationships among the EG patients. After these dynamics were applied, there was a greater interaction between the group members; therefore, the dynamics were effective to guarantee a closer relationship between them. In addition, an initiative to improve interpersonal relations was observed - the patients proposed activities that took place outside the therapeutic environment - which reinforces this research initial hypothesis. Theoretically, engagement is considered to be an aspect that is responsible to promote a favorable environment for symptoms change and reduction[22,25]. However, as the engagement did not differentiate the groups, it cannot be affirmed that the strategies that were proposed did not contribute for a better self-perception of the speech and the communication.

The avoidance was the only aspect that presented difference between the groups, it was reduced in the EG (Table 4); that is, the EG patients began to avoid less the conflicts after the post 2 moment. The EG patients were stimulated - by the group dynamics and coaching strategies - to face and deal with any conflicts, searching for alternatives to face them, to solve them and to overcome them. Therefore, the EG patients had less distress and anxiety to deal with adverse situations[21,22].

On the other hand, conflict - which represents elements of interpersonal conflict and mistrust[9] - was reduced in the post 2 moment, with tendency for statistical difference (Table 4). This tendency can be due to the small sample size and/or due to the limited time offer of group dynamics and coaching strategies. The avoidance and conflict aspects are directly proportional, therefore, there are no great distinctions among its results[9,21,22,25]. However, it is related to therapeutic limitations and to the group size, that is, there will be more conflict if the group has more members[27].

In conclusion, the findings of this study were in agreement with the literature, indicating that traditional therapy results in better voice and communication patterns, regardless of the group climate[20] and with great benefit of the group itself[5,23]. The use of others strategies, such as coping and emotional skills, can contribute to the self-esteem and the self-confidence of each individual, promote a bond between the groups members and lead the group to establish a collaborative environment[25].

Other studies are needed in this field in order to deeply understand the impact that group dynamics and coaching strategies have on the therapeutic outcomes for patients with PD and in order to identify the patterns of its competence.

CONCLUSION

The group dynamics and coaching strategies, as well as the traditional vocal therapy for PD patients, improved the patients vocal quality, speech and communication.

Also, the group dynamics and coaching strategies decreased the avoidance. Therefore, negative effects of the group climate were reduced, which created a more collaborative environment

that could guarantee a better performance for each patient on the speech-language pathology therapy.

ACKNOWLEDGEMENTS

To the Brazilian Parkinson Association - *Associação Brasil Parkinson* (ABP) -, that allowed this study to happen and for all the volunteers who trusted us with their expectation of a better treatment for the PD.

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Authors' contributions

All the authors contributed for this study and participated of all the research stages. PBT participated of the data collection and analyses, manuscript writing and formatting and translation of the abstract to the English language; GM and CP were responsible for the study design, delivering the group dynamics, data analyses, revising the manuscript and translation of the abstract to the English language; GD was responsible for delivering the vocal therapy for the patients, data analyses and revising the manuscript; MB was responsible for the study proposal and design, data analyses e final revision of the manuscript.