

A Quasi-Experimental Study of Holorenic Breathwork in a psychotherapeutical context: preliminary results

Un estudio cuasi-experimental sobre Respiración Holorénica en un contexto psicoterapéutico: resultados preliminares

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Abstract

The purpose of the present study was to explore the effects of Holorenic Breathwork (HrnB), a prolonged, voluntary hyperventilation procedure, on certain personality properties, meaning of life and levels of distress. A total of 62 subjects, aged 18-35 years, were compared using a repeated measures design. The experimental group (N=31) participated for the first time in a workshop where the hyperventilation procedure was used. Measures were taken before and after the workshop (one week and one month later). The control group subjects (N=31) did not receive any alternative treatment. The tests used were the Symptom Checklist-90-Revised (SCL-R-90), the Purpose in Life Test (PLT) and the Temperament and Character Inventory (TCI-R). In the experimental group, there was a significant reduction in the Global Severity Index of the SCL-R-90, and a significant increase in the meaning of life (PLT), Self-directedness, Cooperativeness and Self-transcendence (TCI-R) one week and one month after the workshop.

Keywords: Holorenic Breathwork, hyperventilation, personality, meaning of life, self-transcendence.

Resumen

El presente estudio tiene como objetivo principal explorar los efectos de la Respiración Holorénica (RHrn) en el nivel de malestar subjetivo, percepción del sentido de la vida y ciertas características de la personalidad. La Respiración Holorénica es una técnica voluntaria y prolongada de hiperventilación. Se compararon un total de 62 sujetos, de entre 18-35 años, usando un diseño de medidas repetidas. El grupo experimental (N=31) participó por primera vez en un taller en el que se empleaba la técnica de hiperventilación. El grupo control (N=31) no recibió ningún tratamiento alternativo. Los instrumentos empleados fueron el Inventario de Síntomas- Revisado (SCL-R-90), el Purpose in Life Test (PLT) y el Inventario de Temperamento y Carácter-Revisado (TCI-R). Los resultados del estudio mostraron una reducción significativa en el Índice de Severidad Global del SCL-R-90, y un aumento significativo en el sentido de la vida (PLT), Autodirección, Cooperación y Autotranscendencia (TCI-R), una semana y un mes después del taller.

Palabras clave: Respiración Holorénica, hiperventilación, personalidad, sentido en la vida, auto-transcendencia

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Introduction

Numerous breathing techniques have been used for centuries in different cultures for religious, ritual and healing purposes. It also has been known for a long time that it is possible to induce changes in consciousness by techniques that involve modifications in the breathing rate, accelerating, retaining and controlling it in different ways. The procedures used by different cultures and groups cover a very wide range (Grof and Grof, 2010). Very sophisticated methods of breathing can be found, for example, in the extensive yogic techniques know as *Pranayama*, the ancient Indian system of breath (Vishnudevananda, 1974). Different specific techniques of breathing can be also found in Kundalini Yoga, Sufi practices or in Vipassana and Zen meditation. Focusing on techniques that involve accelerated breathing, a specific form of exercise involving hyperventilation called *Kapalabhati* is found in Pranayama (Desikachar, 1985). Other hyperventilation techniques can be found in Kundalini Yoga, Sufi practices, the Inuit and some Native American First People's groups.

In the context of modern Western culture, these types of methods disappeared for a long time. Western medicine reduced breathing to a physiological process, and the physical and psychological signs that appear when the breathing rate is modified have been considered as pathology. The physiological and behavioural changes associated with accelerated breathing, which include hypocapnia¹, palpitations, dizziness and carpopedal spasms, are the components of the so called "hyperventilation syndrome", which is considered a pathological condition (Morgan, 1983). The term "hyperventilation syndrome" has attracted great interest and controversy since it was introduced, focusing most of the disagreement in the difficulties in establishing a diagnosis (Bass, 1997).

However, during the second half of the XX century, different techniques involving breath and accelerated breathing have been developed in some psychotherapeutic approaches, specifically in the context of the Humanistic and Transpersonal psychology schools and the so called experiential therapies. These techniques include Leonard Orr's Rebirthing (Orr & Ray, 1983) and various neo-Reichian approaches (Lowen, 1976) among others. At the same time, a wide range of Eastern breath techniques were introduced and began to be practiced in Western culture. Furthermore, during the last decades, voluntary hyperventilation has been used in psychiatry and clinical psychology as part of some desensitization therapies for the treatment of anxiety disorders (Meuret, Ritz, Wilhelm. & Roth, 2005). Voluntary hyperventilation has been demonstrated over different studies to be a helpful tool for diagnosis and desensitization in the treatment of anxiety, and has been found to be safe after medical screening for some contraindicated conditions

(Meuret et al, 2005; Zvolensky & Eifert, 2001). Thus, hyperventilation is now one of the tools for the treatment of anxiety disorders.

In this context, in the mid 70's, Stanislav Grof, one of the founders of the Transpersonal Psychology movement, developed the Holotropic Breathwork (HB) technique (Grof, 1988, 2000; Grof & Grof, 2010) at the Esalen Institute, California, after two decades working with LSD and other psychedelic substances in psychotherapy (Grof, 1972, 1973, 1975, 1980²). This method was conceived as a non-drug way of accessing non-ordinary states of consciousness or "holotropic states", a neologism proposed by S. Grof. The word "holotropic" is derived from the Greek words "holos" and "trepein", and means "moving toward wholeness" (Grof, 2000).

HB is a novel experientially oriented therapeutic technique that involves a number of diverse elements, including music, elective bodywork and accelerated breathing (the instruction is to breathe "deeply and mindfully"). HB sessions usually last between 2 and 3 hours, and are terminated voluntarily by the client. Both individual and group therapies are possible, but the group therapy context is the most commonly used. The most characteristic and unique element of this procedure, compared with other psychotherapeutic methods, is the prolonged, voluntary hyperventilation (Rhinewine & Williams, 2007), which can be sustained longer than an hour, but all the cited elements are considered mandatory in the HB procedure.

To date, few studies have examined empirically the therapeutic potential of this hyperventilation procedure, given some preliminary evidence of the clinical utility of HB (Binarova, 2003; Hanratty, 2002; Holmes et al, 1996; Pressman, 1993).

Hanratty (2002) in a single group, pretest-posttest study (N=44), showed that one week after participating in a weeklong HB workshop, participants showed significant reductions in distress/psychiatric symptoms and negative affect. 30% of the English-speaking workshop participants volunteered for the study. Participants were mostly female (73%), highly educated and the mean age was 48,7 years. At the 6 month follow up (N=22) reductions in overall psychiatric symptoms were maintained, although reductions in negative affectivity were no longer significant, and the positive affectivity showed a significant increase. The author suggests that HB may induce a global reduction in the level of arousal to explain these results. Participants also showed higher scores in the number of Positive Symptoms compared with the established norms of the Brief Symptom Inventory at all time points, suggesting that these group represent a mid-level psychologically distressed population. Participants also score higher on the Marlone-Crown Social Desirability Scale and the Tellegen Absorption Scale compared with the norms for

the general population, indicating high trait absorption and social desirability.

Holmes et al. (1996) conducted a controlled non-randomized study, using a pretest-posttest design. The study compared a talk based experientially oriented therapy (EOT) group with a similar group that received a combination of EOT and six monthly sessions of HB. The two groups (N=24 each) were well matched on demographic variables and the extent of prior psychotherapy treatment. The HB group showed significant reductions in death anxiety and increases in self-esteem compared with the EOT group. The authors concluded that experientially oriented psychotherapies might be a useful therapeutic modality, and suggest that they may be particularly useful with long term psychotherapy patients. Similarly, Pressman (1993) conducted a pretest-posttest controlled study (N=40), examining the effects of HB on psychiatric symptomatology and mood state, comparing a group that received six sessions of HB with a control group that receive six sessions of music therapy. Participants were recruited by advertisement at a counseling center, and were matched by age, gender and ethnicity. The two groups were assessed before and after the six sessions of treatment. After the treatment, the HB group showed a higher reduction in psychiatric symptomatology, and a significant difference in all the scales of the Profile of Mood States.

Other similar hyperventilation procedures have been developed as well. In the late 80's the anthropologist Josep Maria Fericgla developed the Holorenic Breathwork (HrnB), based in the Kapalabhati breathing, different shamanic and Sufi breath methods and HB. This hyperventilation technique consists in an increased breath rhythm, reaching to 140-160 breaths per minute, involving other elements, including evocative music and elective bodywork (Fericgla, 2000; 2006). There are some differences between HB and HrnB, including the rhythm and the instruction of the breath, the structure of the music set, and the type of bodywork, but both can be considered very similar methods, based mainly in the use of the prolonged and voluntary hyperventilation, and including the use of music and the elective bodywork. HrnB sessions usually last between 2 and 3 hours, and are terminated voluntarily by the client. The present study explored the effects and effectiveness of this hyperventilation procedure in a psychotherapeutic context.

The aim of the present study was to analyse the effects of a prolonged, voluntary hyperventilation procedure, HrnB, in the context of a weekend experiential workshop. The study analysed, specifically, the relationship between the use of HrnB and the possible changes in certain personality traits, meaning of life and levels of distress, measured with different psychometric tests. It was hypothesised that the group exposed to the HrnB

would reduce their levels of distress, and would increase their meaning of life, self-directedness, cooperativeness and self-transcendence when compared to a non-breathers group.

Method

Participants

Sixty-two participants (31 "breathers" and 31 "non breathers") were recruited from two sources. The *experimental group* ("breathers" or HrnB group) participants were selected from the participants in a weekend residential workshop where the hyperventilation procedure was used and who were exposed to this technique for the first time in their life. The workshop was held at a human development centre near Barcelona once a month. The participants were selected from the participants in the workshops carried out between May 2005 and May 2006, and who completed the inclusion criteria (first breathers aged between 18 and 35 years³). After the first exposure, participants did not practice the HB technique again during the following months. All the participants of each weekend workshop who completed the inclusion criteria were invited to participate in the study. 48 individuals were interested in participating, consented, and completed assessments prior to the HB session. At post-test, one week and one month after the workshop, we were successful in obtaining complete data for 31 individuals.

The *control group* participants were recruited among the students, researchers and professors of different departments and faculties of the Autonomous University of Barcelona (UAB). Subjects from both groups were comparable based on the following criteria: gender, age, education and birthplace. Ages ranged from 20-35 (M=27.38; SD= 4.07). Fifty per cent of the participants were female. The educational level was high: 58% had graduated from college, and 27.4% were in the graduate school.

The *experimental group* (N=31) or *HrnB group* was operationalized as those who had not previous experience with HrnB or other similar hyperventilation procedures. They ranged in age from 21 to 35 (M=28, 03; S.D.=3.84). Sixteen of the subjects were male (51.6%) and fifteen were female (48.4%). Fifty eight per cent were college graduates and another 16% were attending the university.

The *control group* (N=31) or "*non breathers*" group ranged in age from 20 to 35 (M=26,74; SD=4,3). Fifteen of the subjects were male (48,4%) and sixteen were female (51.6%). Fifty eight per cent were college graduates and another 38% were attending the university (Table 1).

Table 1

Age, gender, education level and birth place for HrnB group and non-breathers group.

		<i>HrnB group</i>	<i>Non-breathers group</i>
<i>Age</i>		28.03 (3.84)	26,74 (4.3)
<i>Gender</i>	Man	16 (51.6%)	15 (48.4%)
	Woman	15 (48.4%)	16 (51.6%)
<i>Education</i>	College finished	18 (58.1%)	18 (58.1%)
	College unfinished	5 (16.1%)	12 (38.6%)
	High School	6 (19.3)	1 (3.2%)
	Primary studies	2 (6.4%)	0
<i>Birth place</i>	Catalonia	24 (77.5%)	24 (77.5%)
	Rest of Spain	6 (19.3%)	3 (9.6%)
	South America	1 (3.2%)	4 (12.8%)

Study design

Psychometric measures

The variables examined were measured with three different instruments:

Symptom Checklist-90-Revised (SCL-90-R). This questionnaire measures aspects of psychiatric and psychological distress. It contains 90 items in a five-point Likert format. The test provides a measure of 9 dimensions of symptoms (somatisation, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism) and three global distress indices (the Global Severity Index (GSI), The Positive Symptom Distress Index, (PSDI), and the Positive Symptom Total (PST)). The Global Severity Index (GSI) reflects the total score of the test, and provides a measure of the global level of distress (higher scores indicate a higher distress and symptomatology). This questionnaire has been validated in Spanish, obtaining an internal consistency of $\alpha = 0,75$ (Derogatis, 2002).

Purpose in Life Test (PLT). This questionnaire provides a measure of the extent to which an individual perceives life to be meaningful, based on the theory and concepts of V. Frankl (Crumbaugh, 1968; Crumbaugh & Maholick, 1969). This 20-item questionnaire is rated in a seven point Likert scale. The scoring is within the range of 20-140. Scores under 90 indicate lack of a meaningful life. Scores within the range of 90-105 are described as an "indifferentiation area". Scores over 105 indicate a meaningful life, with goals and a purpose in life. The PIL has been validated in Spanish (Noblejas, 1994),

obtaining an internal consistency of $\alpha = 0.879$ (Noblejas, 2000).

Temperament and Character Inventory- Revised (TCI-R). Based on the psychobiological Personality model of Cloninger (Cloninger, 1999; Cloninger & Svrakic, 1997), the TCI-R is a self-assessed 240-item questionnaire in a five-point Likert format. This questionnaire measures 7 dimensions of personality: 4 Temperament dimensions (Novelty-seeking, Harm-avoidance, Reward dependence and Persistence) and 3 dimensions of Character (Self-directedness, Cooperativeness and Self-transcendence). The TCI-R has been validated in Spanish (Gutiérrez-Zotes et al., 2004).

Procedure

The study compared the HrnB group and the non-breather group using a repeated measure, Pre-Post test quasi-experimental design, in which the volunteers were not randomly assigned to each group. The HrnB group subjects receive one hyperventilation session in the context of a weekend workshop. The control group subject's (non breathers group) did not receive any alternative treatment. Three different measures were taken in both groups, using three questionnaires. The instruments included measures of psychiatric symptoms, levels of distress, meaning of life and personality measures. The measures were distributed in the following way:

Pre-test measures assessed at baseline. The first measure was taken in the HrnB group, the first day of the workshop before their first hyperventilation session. In the control group, the pre-test measure was defined as Time-1.

Post-test measures. After the hyperventilation session, new measures were taken at two different points: one week (Post1) and one month (Post2) after the workshop.

In the non-breathers group, which did not receive any alternative treatment, the three measures were taken with the same timing, and were defined as Time2, Time3 and Time4.

In the *HrnB group*, the data were collected the first day of the workshop. The researcher visited the centre where the workshop was held each month to collect the data. Permission to conduct the study was requested from and granted by the director of the workshop. After the introductory talk of the workshop and before dinner, all first breathers aged between 18-35 were invited to participate in the research and asked to fill out the questionnaires and a socio-demographic survey. Participants were told that the study was part of the researcher's PhD thesis in Psychology. The questionnaire and survey took around 50-60 minutes to fill out. No compensation was offered for participation.

In the *control group*, the data was collected on campus at the Autonomous University of Barcelona (UAB). The subjects were recruited among the students, researchers and professors of the Autonomous University of Barcelona (UAB), and were found in different departments and faculties of the Campus (Psychology, Anthropology, History, Physics and Biology). No compensation was offered for participation.

Results

Data analyses

The data were statistically analysed for 31 par-

ticipants who were exposed to the hyperventilation procedure for the first time and for 31 participants of the control group.

Measures assessed at baseline, before the exposition to the hyperventilation procedure.

In the pre-test/Time1 measure, t test were used to compare the *HrnB* and non-breathers group on the three questionnaires assessing levels of distress, meaning of life and personality traits (SCL-90, PLT and TCI-R).

Measures assessed one week after exposure to the hyperventilation procedure.

In the post1/Time2 measure the *HrnB* and non-breathers group completed the same three questionnaires (SCL-90, PLT, TCI-R). This data were analysed using the following comparisons: (1) comparison (paired t test) of pre test and post1 test data for participants who were exposed to the hyperventilation procedure for the first time (*HrnB* group), (2) comparison (paired t test) of Time1 and Time2 data for the non-breathers group participants, and (3) comparison (independent t test) of post1/Time2 test data obtained at screening for the group of participants who were exposed to the hyperventilation procedure for first time (*HrnB* group) with the group that did not receive any treatment (non breathers).

Measures assessed one month after exposure to the hyperventilation procedure.

This data were analyzed using the following comparisons: (1) comparison (paired t test) of pre test and post2 test data for the participants who were exposed to the hyperventilation procedure for the first time (*HrnB* group), (2) comparison (paired t test) of Time1

Table 2

*Comparison of pre-test mean scores for *HrnB* and non-breathers groups, using raw scores for each measure.*

<i>Questionnaire</i>	<i>Subscale description</i>	<i>HrnB group</i>	<i>Non-breathers group</i>	<i>P value</i>
SCL-90-R	GSI	76.65	51.29	0.016
PLT	Total score	99.77	104.58	ns
TCI-R	Novelty Seeking	112.06	105.68	ns
	Harm Avoidance	93.9	92.87	ns
	Reward dependence	100.94	108.19	ns
	Persistence	109.17	106.97	ns
	Self-directedness	133.48	147.65	0.012
	Cooperativeness	137.71	144.58	ns
	Self-transcendence	84.68	71.32	0.001

Note:

SCL-90-R: *Symptom Checklist-90-Revised*

GSI: Global Severity Index.

PLT: Purpose in Life Test.

TCI-R: Temperament and Character Inventory.

ns: non significant.

and Time3 test data for the control group participants, and (3) comparison (independent t test) of post2/Time3 test data obtained at screening for the group of participants who were exposed to the hyperventilation procedure for first time (HrnB group) with the group that did not receive any treatment (non breathers).

Baseline measure

The two groups of the present study differ at baseline in diverse measures. The HrnB group showed a higher score on the Global Severity Index of the SCL-90-R and a lower score in the PLT compared with the non-breathers group (see Table 2). This result indicates a higher symptomatology and a lower meaning of life in the HrnB group compared with the non-breathers group. Both groups showed also different scores in some traits of personality. In the TCI-R, the HrnB group shows a higher score in novelty seeking and self-transcendence, and a lower score in reward dependence, self-

directedness and cooperativeness, compared with the non-breathers group (see Figure 2).

Post 1/Time2 measures assessed one week after the workshop

As Table 3 shows, compared to the control group, the HrnB group showed a greater reduction in the rating on the SCL-90-R Global Severity Index (GSI) and greater increase in the total score of the PLT between the pre-test and post1-test measure scores. The differences between the baseline and post1 measure were statistically significant for the HrnB group. Four of the nine dimensions of the SCL-90 (obsessive-compulsive, interpersonal sensitivity, hostility and paranoid ideation) also showed significant reductions for the HrnB group (Figure 1: “SCL-90 HrnB Group”).

For the TCI-R, the HrnB group showed an increase in the scores of self-directedness, cooperativeness

Table 3

Comparison of pre-test and post1-test mean scores and t-test p value for HrnB group and non-breathers group, using raw scores for each measure.

	<i>HrnB group</i>			<i>Non-breathers group</i>		
	Pre-test	Post1-test	P value	Pre-test	Post1-test	P value
GSI	76.65	54.52	0.005	51.29	46.26	ns
PLT	99.77	111.06	0.0005	104.58	105.32	ns
NS	112.06	113.42	ns	105.68	106.87	ns
HA	93.9	87.61	ns	92.87	92.61	ns
RD	100.94	102.77	ns	108.19	108.84	ns
PS	109.17	106.5	ns	106.97	108.61	ns
SD	133.48	143.97	0.003	147.65	147.23	ns
CO	137.71	142.71	0.03	144.58	145.1	ns
ST	84.68	87.94	ns	71.32	67.87	ns

Note:

GSI: Global Severity Index; PLT: Purpose in Life Test; NS: Novelty Seeking; HA: Harm Avoidance; RD: Reward dependence; PS: Persistence; SD: Self-directedness; CO: Cooperativeness; ST: Self-transcendence; ns: non significant.

Table 4

Comparison of pre-test and post2-test mean scores and t-test p value for HrnB and non-breathers groups, using raw scores for each measure

	<i>HrnB group</i>			<i>Non-breathers group</i>		
	Pre-test	Post2-test	P value	Pre-test	Post2-test	P value
GSI	76.65	43.26	0.0005	51.29	44.55	ns
PLT	99.77	111.0	0.0005	104.58	106.74	ns
NS	112.06	113.77	ns	105.68	107.03	ns
HA	93.9	86.87	0.007	92.87	91.42	ns
RD	100.94	107.29	0.0005	108.19	108.58	ns
PS	109.17	107.94	ns	106.97	109.84	ns
SD	133.48	144.97	0.001	147.65	145.39	ns
CO	137.71	145.84	0.0005	144.58	143.45	ns
ST	84.68	90.03	0.017	71.32	69.68	ns

Note:

GSI: Global Severity Index; PLT: Purpose in Life Test total score; NS: Novelty Seeking; HA: Harm Avoidance; RD: Reward dependence; PS: Persistence; SD: Self-directedness; CO: Cooperativeness; ST: Self-transcendence; ns: non significant

and self-transcendence, and a reduction of the harm avoidance, compared with the pre-test. The differences between the baseline and post1 measure in self-directedness and cooperativeness were statistically significant for the HrnB group (Table 3 and Figure 2).

The control group showed a reduction in the GSI and self-transcendence ratings and a small increase in the persistence score of the TCI-R between the baseline and post1 measure (see Figure 2). These scores did not differ significantly (Table 3).

Post 2/Time3 measures assessed one month after the workshop

One month after the workshop, compared to the baseline score, the GSI score continued reducing in the HrnB group and the PIL total score reduction was maintained. Compared to the non-breathers, the HrnB group showed greater reduction in the rating of the GSI and significantly greater elevation in the rating of the PIL

between the pre-test and post2-test measure scores. The differences between the baseline and post1 measure in the GSI and the PIL total score were statistically significant for the HrnB group (Table 4). Eight of the nine dimensions of the SCL-90 also showed significant reductions between the baseline and post1 measure for the HrnB group (Figure 1: “SCL-90 HrnB Group” graphic).

For the TCI-R, the scores of reward dependence, cooperativeness and self-transcendence continued increasing in the HrnB group between the baseline and post1 measure. The differences in harm avoidance, reward dependence, self-directedness, cooperativeness and self-transcendence were statistically significant between the pre-test and the post2-test measure scores for the HrnB group (Table 4 and Figure 2).

Comparing the HrnB and non-breathers groups in the post2 measure, the ISG score was lower in the HrnB group. In the TCI-R, the score of Self-transcendence was higher in the HrnB group. It is re-

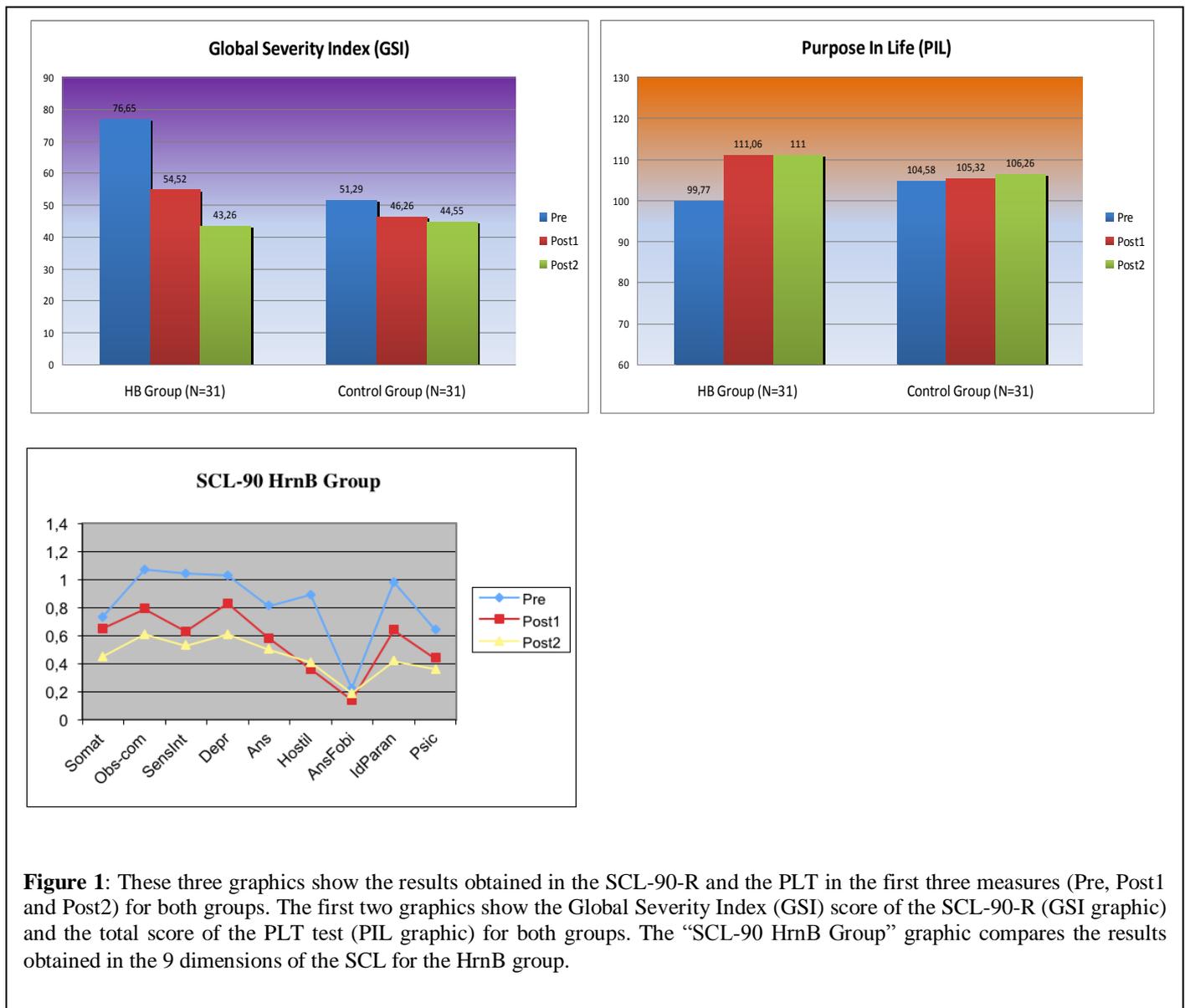


Figure 1: These three graphics show the results obtained in the SCL-90-R and the PLT in the first three measures (Pre, Post1 and Post2) for both groups. The first two graphics show the Global Severity Index (GSI) score of the SCL-90-R (GSI graphic) and the total score of the PLT test (PIL graphic) for both groups. The “SCL-90 HrnB Group” graphic compares the results obtained in the 9 dimensions of the SCL for the HrnB group.

markable that the differences in the GSI and in the novelty seeking, reward dependence, self directedness and cooperativeness dimensions found in the Pre-test between both groups were reduced or disappeared in the Post2-test, with both groups showing similar scores. Finally, rating in the PIL was higher in the HrnB group.

Discussion

The purpose of the present study was to explore the effects of HrnB on certain personality properties, meaning of life and levels of distress. Greater differences across time were found in the three psychometric measures used for the study, with the HrnB group showing greater reductions in the levels of distress and harm avoidance, and greater increases in the meaning of life, self-directedness, cooperativeness and self-transcendence than the non-breathers group. The fact that these differences were obtained in a sample that showed a high symptomatology and a low meaning of life, self-directedness and cooperativeness, suggest that HrnB may be particularly useful with individuals who have a high level of distress, and a poor meaning of life,

self-directedness and cooperativeness.

These results indicate that, for this sample, therapeutic improvement in levels of distress, meaning of life, self-directedness and cooperativeness were stronger in the group that participated in a weekend workshop where HrnB was used, than in the non-breathers group, which did not receive any alternative treatment. As the present study design was quasi experimental, we cannot draw cause-effect conclusions from it. Some other limitations can be pointed out also. The extent in which the study population limits the generalizability of the results is unknown. However, the results suggest that the use of the HrnB in a weekend workshop context may be a potentially useful psychotherapeutic method that deserves further study.

Comparing our results with other studies, regarding the SCL-90-R test, Hanratty (2002) also found a significant reduction of the GSI of the BSI test (a brief version of the SCL-90-R) one week ($p < .001$; $N=42$) and six months after a weeklong HB workshop. Hanratty also found a significant reduction of the negative affect scale of the PANA test (Positive Affect-Negative Affect) in the pre1-test, one week after the

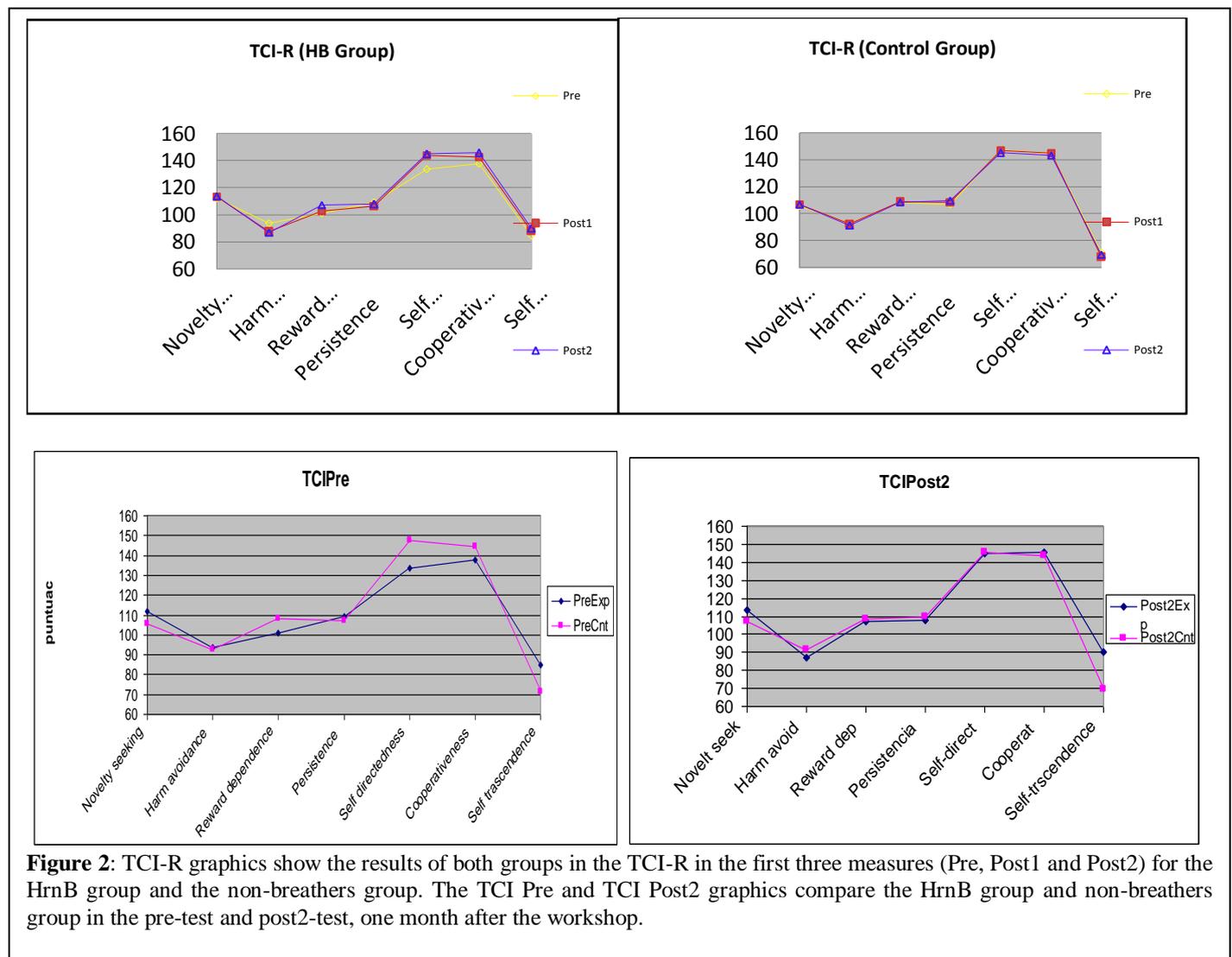


Figure 2: TCI-R graphics show the results of both groups in the TCI-R in the first three measures (Pre, Post1 and Post2) for the HrnB group and the non-breathers group. The TCI Pre and TCI Post2 graphics compare the HrnB group and non-breathers group in the pre-test and post2-test, one month after the workshop.

workshop, and a significant increase of the positive affect scale in the post2-test, six months after the workshop. Metcalf (1995) found an improvement in the levels of depression, anxiety and somatizations, and more fluent interpersonal relationships in a group of alcoholics and drug addicts (N=20) who received repeated HB sessions as part of their treatment, using an interview and a self reported survey. Regarding the PLT results, Binarova (2003) found a significant improvement in the purpose in life (measured by the PLT) in a group of subjects that participated for first time in a HB session (N=11; $p < 0.05$). However, Binarova (2003) did not find differences between a HB experienced group and a non-breathers group (both of them N=34) in PLT scores. Holmes et. al (1996) found greater reductions in death anxiety and increases in self esteem (using the DAS and the Personality Research Form-E) in a group which received a combination of HB and experientially oriented verbal psychotherapy, compared with a group which participated only in experientially oriented verbal psychotherapy. The increase in self-esteem could be related to the increase in self-directedness found in the present study. These results point in the same direction as the results of the present study, also showing some differences. However, the aforementioned studies were preliminary studies, made with small samples and occasionally with deficient methodologies (Rhinewine & Williams, 2007). Some limitations can be pointed also to the present study.

The first limitation of the present study is the type of design. The subjects were not randomly assigned to the groups, and all the subjects were voluntarily participating in the study. The differences observed between the breathers and non-breathers could be attributed to self-selection bias. The HrnB group sample was self-selected in a double sense: they were selected from the participants in the weekend workshops, and they were volunteering for the study. As the study was quasi-experimental, we cannot affirm if the effects were specific to the exposure or if they were caused by other factors, which would also reduce the comparability among the groups.

A second limitation of this study, related to the first, are the differences found between the two groups in the baseline. These differences indicate that the persons who participated in this workshop shown a specific profile, including higher symptomatology, novelty seeking and self-transcendence, and lower meaning of life, self-directedness and cooperativeness. Similar differences to those found in the present study in the GSI and self-transcendence scores were found by Hanratty (2002) in a study evaluating the efficacy of HB. Hanratty found a higher score on the Global Severity Index of the BSI test (a brief version of the SCL-90-R) and in Tellegen's Absorption scale in a group of participants in a weeklong HB workshop, as compared with the general population.

The Absorption scale measures the capacity of one person to access non-ordinary states of consciousness, and is similar to the self-transcendence scale of the TCI-R. Grof (2002) also explains that the people who have had transpersonal experiences in their lives are more attracted to non-ordinary states of consciousness and techniques such as HB. Finally, being a novel psychotherapeutical approach, the high scores in novelty seeking were expected.

A third limitation of the study is that the weekend workshop included different elements besides HrnB, including an introductory talk and exercises, a personal interview, dance, group dynamics and psychotherapeutical support. We cannot establish whether the differences found in the HrnB group were caused by HrnB and/or by other elements. Furthermore, the results cannot be generalized to other contexts nor to all the participants of this weekend workshop, but they do support the idea HrnB may contribute to improve psychological health.

Conclusions and future projects

The present study was motivated by the lack of studies regarding the short and long term effects of HrnB and other similar hyperventilation procedures. The results of this investigation provide some initial positive findings (with the indicated limitations) regarding the possible therapeutic usefulness of HrnB. Several conclusions can be drawn from our results. First, the groups in the present study differ at baseline in diverse measures. The HrnB group showed a significantly higher symptomatology and a lower meaning of life compared with the non-breathers. The HrnB group also showed different traits of personality, including higher novelty seeking and self-transcendence, and lower reward dependence, self-directedness and cooperativeness. Second, the HrnB group showed significantly greater changes over time on dependent measures compared with the control group. The HrnB group showed, one week after the workshop, significantly greater reductions in the levels of distress, and significantly greater elevations in the meaning of life, self-directedness and self-transcendence. One month after the workshop, the HrnB group maintained these changes, and also showed a significant reduction of harm avoidance, and a significant increase in the reward dependence and cooperativeness.

Due to the results obtained in the present research, HrnB may be particularly helpful for treating conditions such as depression and anxiety, and may also have the potential to successfully help people with existential neurosis. Consequently, even though little definitive can be concluded about the generalized efficacy of HrnB from these results, we do conclude that HrnB used in a safe and supportive therapeutic context appears to be a promising method for the treatment of different

conditions, including anxiety, depression and existential neurosis.

Further research into short and long-term effects of HrnB and other similar hyperventilation procedures would be useful. There are a number of areas of potential interest that might be examined in future research. These areas include the use of different psychometric measures, the assessment of physiological variables, and the study of this technique with qualitative methodology. We also believe that the setting -the context surrounding the experience- is very important in relation to the effects produced by this non-drug way of accessing non-ordinary states of consciousness. Thus, future research aimed at assessing the extent to which these results are specific to the context is needed. The development of similar studies in other contexts where HrnB and other similar hyperventilation procedures are used could be very fruitful.

In order to explore the possible usefulness of HrnB as a novel psychotherapeutic method for the treatment of different conditions, beyond what appears to be some initial positive results found in the present study, we thought it is very important to replicate these results in a larger and well-controlled study. A double blind, randomized, placebo-controlled study of the efficacy of HrnB for the treatment of different conditions, including depression, anxiety disorders and existential neurosis might be designed and carried out as the next step.

Footnotes

¹Hypocapnia, a decrease in brain CO₂ partial pressure, is associated with hyperventilation, and different studies have shown that it induces changes in different neurophysiologic measures, including evoked potentials and functional neuroimaging.

²For additional work of Grof with psychedelic substances in psychotherapy, see also: Grof, S., Goodman, L. E., Richards, W. A., & Kurland, A. A., 1973a; Grof and Halifax, 1977; Grof, S., Soskin, R. A., Richards, W. A., & Kurland, A. A., 1973b; Kurland, A. A., Pahnke, W. N., Unger, S., Savage, C., & Grof, S., 1971a; Kurland, A. A., Savage, C., Pahnke, W. N., Grof, S., & Olsson, J. E., 1971b; Pahnke, W. N., Kurland, A. A., Unger, S., Savage, C., & Grof, S., 1970; Richards, W. A., Grof, S., Goodman, L., & Kurland, A. A., 1972; Soskin, R. A., Grof, S., & Richards, W. A., 1973.

³The 62 study participants were medically and psychiatrically healthy, without previous experience with hyperventilation techniques, aged between 35 years old.

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