

# Rehabilitation Psychology

## Metacognitive Therapy in a group of patients with tinnitus: a brief report

--Manuscript Draft--

<b>Manuscript Number:</b>	
<b>Full Title:</b>	Metacognitive Therapy in a group of patients with tinnitus: a brief report
<b>Abstract:</b>	<p><b>Purpose</b> Tinnitus is often in comorbidity with anxiety and depression and several authors have proposed a reduced efficiency of the top-down executive control in its perception. This brief report describes a metacognitive therapy approach, that works on a top-down engagement of proactive attentional control mechanisms, able to reduce anxiety and depression, on a group of patients with tinnitus.</p> <p><b>Design</b> Eight metacognitive therapy group-sessions were proposed to a group of patients, afferent to the Tinnitus Centre of Audiology Unit, as part of a regional project conducted at the "Policlinico Paolo Giaccone" General Hospital in Palermo. The last was a follow-up session, proposed three months after the seventh. The Tinnitus Handicap Inventory (THI) and the Hospital Anxiety and Depression Scale (HADS) were proposed during the first, the seventh and the follow-up group session.</p> <p><b>Results</b> Anxiety scores were above the cut-off at baseline, (HADS-A: <math>m=8.44</math>; <math>sd=3.08</math>), while mean depression scores were not. There was a moderate perception of disability for tinnitus (THI: <math>m=42.8</math>, <math>sd=23.3</math>), that was related to depression and anxiety scores at baseline, but not to the persistence of the tinnitus in months. Wilcoxon Test for repeated measures showed a reduction in anxiety (<math>z=-2.4</math>, <math>p=0.008</math>, <math>r=0.8</math>) and THI scores (<math>z=-2.7</math>, <math>p=0.003</math>, <math>r=0.9</math>), at the end of the seven group sessions. These results stayed stable at the follow-up.</p> <p><b>Conclusion</b> The use of metacognitive therapy appears to offer promise in reducing the perception of the tinnitus and the anxiety of patients and designed trials are needed to test its feasibility and replicability.</p>
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Prof. Stephen T. Wegener

Editor of *Rehabilitation Psychology*

**Subject:** submission of manuscript “Metacognitive Therapy in a group of patients with tinnitus: a brief report”

December 20th, 2017

Dear Prof. Stephen T. Wegener,

please find enclosed a manuscript entitled “Metacognitive Therapy in a group of patients with tinnitus: a brief report” which we are submitting for exclusive consideration to be published in *Rehabilitation Psychology*.

The article is a brief report describing the effects of a metacognitive therapy approach on a group of patients with tinnitus, followed up for eight group sessions in order to help them to manage the perception of disability associated with a chronic tinnitus. The intervention was part of a regional project of psychological and rehabilitation interventions for critical units (Interventi Psicologici e Riabilitativi per I reparti ad Alta Criticità - IPRAC), conducted at the “Policlinico Paolo Giaccone” General Hospital in Palermo, Sicily.

It was one of several psychotherapeutic approaches (gestalt, CBT, cognitive, psychodynamic) proposed to patients afferent to the general hospital, previously screened for their anxiety and depression scores by HADS (Hospital Anxiety and Depression Scale). We proposed for the first time this approach to patients with tinnitus, that works on a top-down engagement of proactive attentional control mechanisms, able to reduce anxiety and depression, because we hypothesised a potential role of metacognitive therapy in reducing both psychological distress and the perception of disability associated to the tinnitus. In spite of its limitations, we believe that this report could be interesting for its results: because Wilcoxon Test for repeated measures showed a reduction in anxiety and THI (Tinnitus Handicap Inventory) scores, at the end of the seven group sessions with nine patients. These results stayed stable at the follow-up three months after the last session. However, the absence of a structured control group gives to the study the connotation of a case report that needs to be further studied to test its efficacy and replicability.

We authors comply with APA ethical standards in the conduct of the work reported in the manuscript.

These results have never been published and are not presently under consideration for publication elsewhere.

All authors have contributed significantly and are in agreement with the content of the manuscript.

We declare no possible conflict of interest, financial or otherwise, related to the submitted work.

On behalf of all authors,  
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# Metacognitive Therapy in a group of patients with tinnitus: a brief report

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**Founding and Competing Interests:** Authors have no competing interests to declare.

### **Impact and Implications**

- Several authors have proposed a reduced efficiency of the top-down executive control in tinnitus, that plays a role in attention resources.
- Metacognitive therapy (MC) works on a top-down engagement of proactive cognitive control mechanisms, toward attention, however it has not previously applied on tinnitus.
- Eight metacognitive therapy group-sessions were proposed to a group of nine patients, and resulted effective in reducing both the perception of the tinnitus and the anxiety of patients.

## **Introduction**

Tinnitus is the conscious perception of an auditory sensation in the absence of a corresponding external stimulus. Its prevalence is around 10-15% of the adult population. The origins of tinnitus are complex. Hearing loss and hyperacusis are common accompanying symptoms (Baguley, McFerran, & Hall, 2013). Tinnitus is often in comorbidity with anxiety and depression problems, which are related to higher levels of perceived disability and it can lead to concentration problems, by compromising the ability to complete an intellectual work (Langguth & Landgrebe, 2011). One of the most commonly used treatment for tinnitus is the Tinnitus Retraining Therapy (TRT), which consists of an habituation-based technique based on *counselling* and sound-therapy that results more effective than masking alone (Henry et al., 2006). It was recently proposed a relationship between tinnitus and attention disorders (Heeren et al., 2014), which prevent the habituation process (Roberts, Husainb, & Eggermont, 2013) that normally inhibits “phantom” auditory perception from reaching awareness (Andersson et al., 2000; Jastreboff & Jastreboff, 2000). Several authors have proposed a reduced efficiency of the top-down executive control in tinnitus, that plays a role in attention resources (Araneda, De Volder, Deggouj, Philippot, et al., 2015; Araneda, De Volder, Deggouj, & Renier, 2015; Das, Wineland, Kallogjeri, & Piccirillo, 2012) and inhibits automatic responses to a stimulus

(Posner & Rothbart, 2007). *Metacognitive Therapy* (MCT) is a recently developed psychotherapy introduced by Adrian Wells and Gerald Matthews (Wells & Matthews, 1994) for anxiety and depression, focused on metacognition and metacognitive beliefs, experiences and strategies. Metacognition is the ability of “thinking about one’s thinking”, able to control, monitor and assess the cognitive processes. It leads our consciousness and what we pay attention to. Metacognitive beliefs are that theories that we construct about the content of our own thoughts and the efficiency of our mind (Wells, 2002; Wells & Matthews, 1994). A metacognitive experience is the evaluation of one’s state of mind and feelings in a situation. Finally, metacognitive strategies are the methods people try to apply in order to control and change their own thoughts (Wells, 2002). Metacognitive theory supports the idea that most of psychological disorders result from specific patterns of dysfunctional thoughts and repetitive negative thinking (rumination), which are, in turn, a consequence of dysfunctional metacognitive beliefs, experiences and strategies (Wells, 2002). Metacognitive therapy works on a top-down engagement of proactive cognitive control mechanisms – toward attention – and by a cognitive work on dysfunctional ideas. The two main techniques are the *Attention Training Technique* (ATT) and the *Detached Mindfulness* (DM) (Wells & Melli, 2012). ATT is an attention training designed in order to increase awareness and control

about rumination and consists of actively listening and focusing attention in the context of simultaneous sounds presented at different loudness and spatial locations. With the term “mindfulness” is meant the awareness of thoughts and the ability to distinguish a negative thought from a subsequent worry or ruminative response to that thought. With the term “detachment” is meant to stop or disconnect any response to that thought, and to experience oneself as separate from a thought and as simply an observer of it (Wells & Matthews, 1994; Wells & Melli, 2012). This brief report describes the results of this intervention and its potential in reducing anxiety, depression and the perception of the tinnitus in a group of patients with tinnitus. To our knowledge, this is the first time that metacognitive therapy (MC) effects in tinnitus are described.

### **Brief Report**

The IPRAC project (*Interventi Psicologici e Riabilitativi nei Reparti ad Alta Criticità – Psychological and Rehabilitation Interventions in High Risk Units*) took place at the Psychiatric Unit of “Paolo Giaccone” University General Hospital of Palermo, which coordinated the project. From January 2013 to October 2014, N=267 patients admitted to different Units, were referred to the IPRAC project by their doctors or asked for a psychological help by themselves, they all were administered with the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983). Nine therapists from different

psychotherapeutics approaches were employed with the aim to assess anxiety and depression levels of referred patients and to offer them psychological help. 20% of patients (N=53; 18 males and 35 females; aged 23-79 years,  $m=51.2$ ;  $sd=12.9$ ) was constituted by subjects with tinnitus, referring to the Tinnitus Centre of the Audiology Unit. They showed medium scores for anxiety (HADS-A) above the cut-off of pathology ( $8.70$ ;  $sd=4.8$ ) and normal medium scores of depression (HADS-D  $m=6.19$ ,  $sd=4.9$ ). They all were administered with *Tinnitus Handicap Inventory (THI)* a 25-item self-report instrument developed by Newman, Jacobson, & Spitzer, (Newman, Jacobson, & Spitzer, 1996) by their audiologist and the mean score was  $47.2$  ( $sd=27.6$ ) i.e. moderate tinnitus. The audiologist proposed a first group meeting to his patients who were not into an individual psychotherapy setting, suffering from bilateral neuro-sensory moderate deafness, without any implants and free from dizziness. They were invited to attend an informative seminar on psychological aspects of tinnitus that proposed the metacognitive approach to the tinnitus in a group setting. Patients who asked to be included into the group, signed an informed consent form before to be engaged into the therapeutic experience, as part of their clinical notes, their data were stored anonymously and they were informed that they could leave the experience at any time. Twelve patients participated to the first session, nine of them concluded the whole experience. No one

of them was taking medications or doing psychotherapy or rehabilitation treatment for tinnitus and/or other mental disorders at the time of the first meeting and during the whole experience. Each group session lasted an hour and a half, and took place every two weeks. Seven group sessions were conducted between March 2015 and December 2015 by four trained psychotherapists. The follow-up session was in March 2016. Tinnitus was presented and treated as an intrusive and annoying thought, able to pathologically draw the attention of the subject, and boosting its own perception. Tinnitus was also considered as a trigger for a chain of bad thoughts capable to arouse anxiety, sadness and helplessness about tinnitus and in everyday activities. During the *first session* patients introduced themselves and the therapists explained the therapeutic rationale and the methods and the way to think about the tinnitus as an intrusive and an annoying sound, similar to a thought. The *second session (two weeks later)* was used to collect medical, tinnitus and psychopathological history by a socio-demographic sheet, the THI and the HADS questionnaires. During the *third session (two weeks later)* was presented one ATT preliminary example, followed by two ATT sessions, including the subjective rating scale of attention self-administration, in order to establish how much of one's attention is focused inward (+3) or outward (-3) (Wells & Melli, 2012). Summary document on ATT and homework delivery: subjects were asked to repeat one-

two times a day the ATT exercise at home. During the *fourth session (two weeks later)* the homework were discussed and were followed by two ATT sessions, including the subjective rating scale of attention self-administration. Subjects were asked to repeat one-two times a day the ATT exercise. During the *fifth session (two weeks later)* was introduced the *detached mindfulness*, trough metaphors and metacognitive orientation, was administered the MCQ-30, were introduced the metacognitive exercises (i.e. the tiger exercise by Wells et al. 2012) and were suggested homework, e.g. to find new metaphors and to repeat the exercises alone, at least once a day and to repeat ATT exercise one-two times a day. *Sixth session (two weeks later)* was dedicated to share and discuss the *detached mindfulness* homework, new metaphors on thoughts and metacognitive exercises were developed. ATT and detached mindfulness exercises were suggested as homework. During the *seventh session (two weeks later)* each participant gave his/her opinion on the group meetings and techniques used and the goals reached. HADS, THI and MCQ-30 were proposed again. Patients were advised to use the new abilities in their everyday activities. *Eighth session (after three months)* was used to share and discuss the use the new abilities in everyday activities. HADS, THI and MCQ-30 were proposed for the last time. People who completed the experience were five males and four females, with an age ranging between 44 and 59 years (m=49.1;

sd=4.7). Five of them achieved a diploma, the remaining four had a compulsory school education. The nine subjects presented a long history of tinnitus, ranging between 6 and 300 months (m=150.3 months; sd=130.9). Anxiety was above the cut-off score of 7 at baseline, (HADS-A: m=8.44; sd=3.08), while mean depression scores were not (HADS-D: m=5; sd=4.2). THI scores were highly different between subjects and with a mean score of a moderate perception of tinnitus (m=42.8, sd=23.3) (Table 1). The characteristics of this IPRAC-derived sample were comparable with those of the original abovementioned sample for anxiety ( $p=0.0859$ ), depression ( $p=0.373$ ) and THI ( $p=0.678$ ). There were no correlations between the persistence of the tinnitus in months and THI and HADS, both anxiety and depression scores (all  $p>0.05$ ). Non-parametric correlation statistics (*Spearman's Rho*) were applied and, as expected, anxiety and depression scores were related each other ( $Rho=0.719$ ;  $p=0.029$ ) and higher scores of THI were related to higher scores of both anxiety ( $Rho=0.856$ ;  $p=0.003$ ) and depression ( $Rho=0.762$ ;  $p=0.017$ ). The MCQ-30 questionnaire was administered during the fifth group session. The scores resulted variables between subjects (m=67.4; sd=12.7). The highest medium score regarded negative believes on rumination and its risks (NEG\_MCQ m=16.1; sd=3.9). At the end of the last group session, HADS, THI and MCQ-30 were administered, in order to test changes in their scores. THI resulted "mild" or

“slight” for the majority of the subjects, with a medium score of 29.3 (sd=18.9), i.e. mild. Anxiety mean scores resulted normalized and lower than the cut-off of 7 (m=6.3; sd=2.3) and the same was true for depression scores (m=4.3; sd=4.3). The MCQ-30 mean scores were lower than those measured during the fifth meeting (m=58.8; ds=14.7). Non parametric Wilcoxon Test for repeated measures was used in order to see if the change of clinical scores at the end of the experience and at follow-up was significant compared with the scores at the baseline. Anxiety scores resulted lower than those measured at baseline ( $z=-2.4$ ,  $p=0.008$ ,  $r=0.8$ ) and the same was true for THI scores ( $z=-2.7$ ,  $p=0.003$ ,  $r=0.9$ ) and MCQ-30 scores ( $z=-2.3$ ,  $p=0.010$ ,  $r=0.76$ ). Not significant changes were detected in depression scores ( $p=0.461$ ). The Figure presents similar scores of THI at follow up, that stayed at a tolerable level (m=28, sd=28.5) and maintained a significant difference with the baseline scores (Wilcoxon Test:  $z=-2.5$ , *two-tailed*  $p=0.012$ ,  $r=0.83$ ) and no differences with the last session ( $p>0.05$ ). Anxiety scores were lower at follow-up than at baseline (Wilcoxon Test:  $z=-2.5$ , *two-tailed*  $p=0.011$ ,  $r=0.83$ ) and they were not different from scores registered during the last session ( $p>0.05$ ). Depression and MCQ-30 scores at follow-up were similar to those at baseline ( $p>0.05$ ) (Figure 1).

## **Discussion**

It was proposed that a score at THI higher than 36 is an indicator for psychiatric diseases and that THI is a good indicator for comorbidity (Salviati et al., 2013) as it was the case in our little group, where we found a positive correlation between the perceived severity of the tinnitus, measured by THI, and anxiety and depression scores by HADS. Patients were not depressed, but they resulted moderately annoyed by tinnitus in their everyday activities and their anxiety scores resulted over that expected in the general population (Landgrebe & Langguth, 2011). We also confirmed that there was no correlation between the perceived severity of the tinnitus and the duration of it (Gul, Aydin, Simsek, Saydam, & Ozkiris, 2015). During the course of the sessions, patients have learnt new techniques in order to enhance their attentional competences and they could benefit from a group setting to share their experiences and thoughts about tinnitus. Anxiety scores were significantly reduced at the end of the experience and the benefits were maintained over the course of the follow-up. The same was true for the perception of the tinnitus, that lowered at a tolerable level, by maintaining this result up to three months after the conclusion of the experience. Depression scores did not change at the end of the experience; however, they were not pathological at the baseline. Subject number 4, whose anxiety and depression levels remained significantly high, found into the group the right setting in order to share his suffering and found-out an individual

psychotherapeutic help at the end of the experience. Subjects were asked about the impact of the techniques on their everyday life and they referred to have used them in order to both distribute the attention to other auditory stimuli, different from their tinnitus, and to do not pay attention to rumination about tinnitus, by reducing its significance. The MCQ-30 scores improved in two sessions, by indicating a reduction of dysfunctional metacognitive believes of patients. However, this result was not stable over time, probably because less time was spent to this part of the work. The IPRAC participants who did not adhere to the therapeutic group proposed, could represent a group of less-compliant patients, more likely to have a worse outcome over time. On the other hand, has been proposed that help-seeking tinnitus patients have higher scores in psychological and somatic symptoms compared to non-help-seekers counterparts (Scott & Lindberg, 2000).

### **Conclusions**

The use of metacognitive therapy appears to offer promise in reducing the perception of the tinnitus and the anxiety of patients, by reducing the significance of annoying thinking and rumination. The group appears a good setting for patients sharing their experience and learning metacognitive techniques and further studies are needed to test its efficacy and replicability in a controlled trial, by adding a second test for the attentional

changes, other than the subjective rating scale of attention, administered during ATT, as part of the therapeutic tool.

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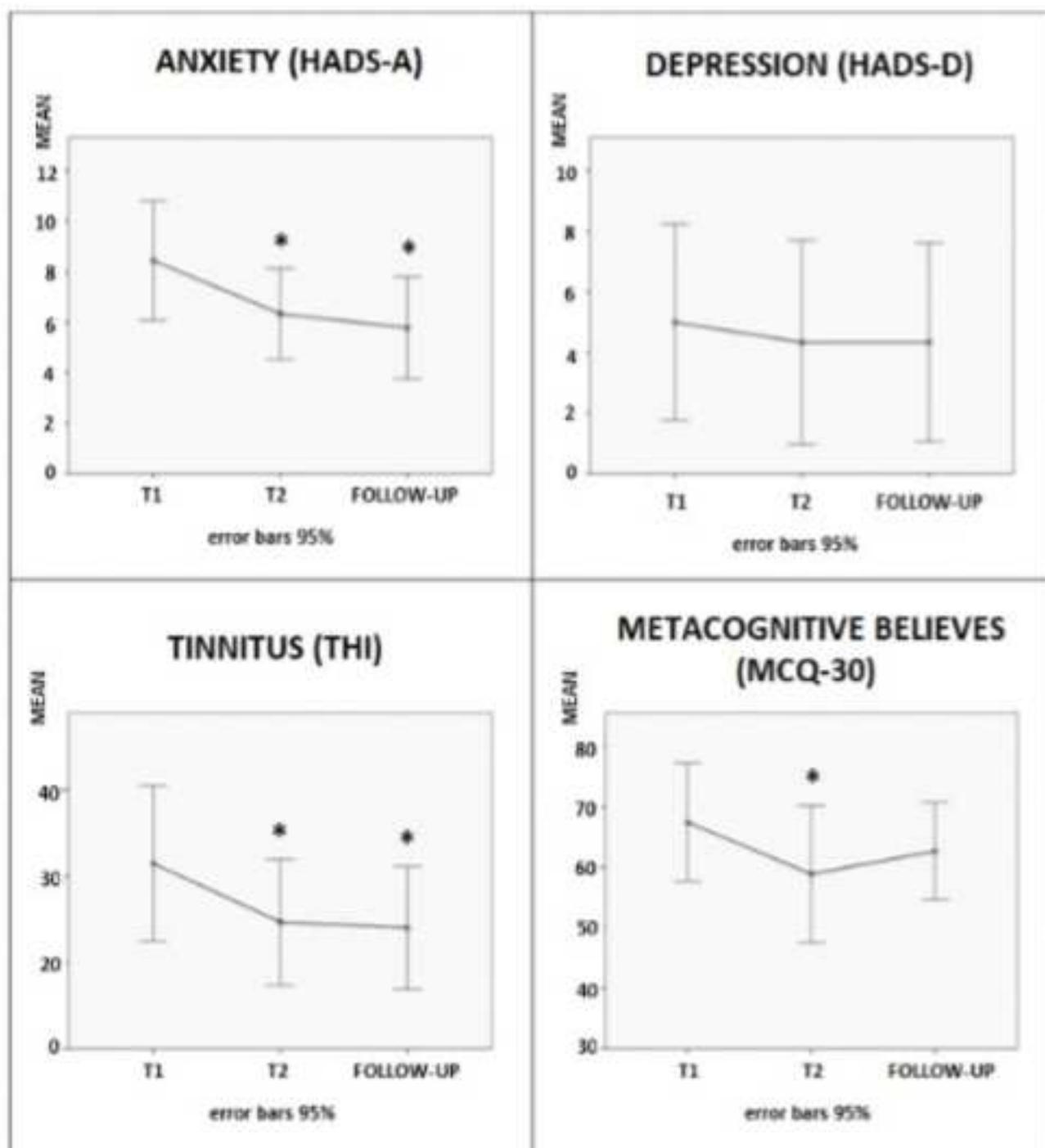
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**Table 1. Socio-demographic and clinical characteristics of the subjects during the first group meeting.**

Subject	Gender	Age	Education	Months of tinnitus	Anxiety (HADS-A)	Depression (HADS-D)	THI	Tinnitus classification
1	Male	49	Compulsory	300	<b>9</b>	<b>9</b>	80	<b>catastrophic</b>
2	Male	59	High school	6	4	3	22	mild
3	Male	53	High school	360	5	1	24	mild
4	Male	47	Compulsory	120	<b>14</b>	<b>13</b>	80	<b>catastrophic</b>
5	Female	45	High school	120	7	1	28	<b>moderate</b>
6	Female	51	High school	36	<b>9</b>	2	34	<b>moderate</b>
7	Female	45	Compulsory	15	<b>10</b>	7	44	<b>moderate</b>
8	Female	49	High school	276	<b>11</b>	7	52	<b>moderate</b>
9	Male	44	Compulsory	120	7	2	22	mild

*Legend:* compulsory education in Italy consists of five years of primary school and three years of low-degree secondary school (8 years in total). High school consists of additional five years of secondary education (13 years in total). Scores above the cut-off are in bold.



**Figure 1. Changes in clinical measures over time.**

*Legend:* each graph represents the median and the error bar of a clinical measure score (Y axis), measured at three different times (X axis): at baseline, during the last meeting and at follow up.