

## Article original/Original article

# Therapeutic patient education with art therapy: effectiveness among obese patients

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**Abstract – Objective:** To evaluate the efficacy of art therapy in a 2-week in-hospital therapeutic patient education (TPE) program for obese patients. **Methods:** One hundred seventy obese patients were studied before the TPE program and 6 weeks later. Patients were randomized in two groups: Group 1 without art therapy ( $N = 74$ , body-mass index (BMI) =  $37.5 \pm 7.8$  kg/m<sup>2</sup>) and Group 2 with art therapy ( $N = 96$ , BMI =  $39.3 \pm 7.6$  kg/m<sup>2</sup>). Group 2 subjects received five structured sessions of manual and standardized art therapy during the 2-week in-hospital TPE program. **Results:** A significant weight loss ( $p < 0.001$ ) was observed in both groups after 6 weeks following the TPE program. Group 2 subjects receiving art therapy showed an increase in quantitative indicators of creativity as well as qualitative indicators as compared to Group 1 without art therapy. However, group 1 without art therapy displayed a consistent reduction in all quantitative and qualitative indicators of creativity during and after the TPE program. **Conclusion:** Art therapy contributes into the development of creative potential during and following a 2-week TPE program for obese patients. Art-therapy should be proposed in combination with therapeutic patient education for obese patients.

**Key words:** art therapy / therapeutic patient education / creativity / obesity / quality of life

**Résumé – Art-thérapie et éducation thérapeutique : efficacité chez les patients obèses.** **Objectif :** L'objectif de cette étude est d'évaluer l'impact d'ateliers d'art-thérapie intégrés à un programme d'éducation thérapeutique pour patients obèses. **Méthodes :** Cent soixante-dix patients obèses ont été explorés et divisés en deux groupes dans le cadre d'une recherche multicentrique avant et après six semaines d'un programme d'éducation thérapeutique avec ou sans art-thérapie. Groupe 1 :  $N = 74$ , indice de masse corporelle (IMC) =  $37,5 \pm 7,8$  kg/m<sup>2</sup>, groupe 2 :  $N = 96$ , IMC =  $39,3 \pm 7,6$  kg/m<sup>2</sup>. Le groupe expérimental (groupe 2) a bénéficié de 5 séances d'art-thérapie structurées, et standardisées au cours d'un programme d'éducation thérapeutique de deux semaines en milieu hospitalier. **Résultats :** Les résultats montrent pour les deux groupes (avec et sans art-thérapie) une amélioration du poids ( $p \leq 0,001$ ) et du IMC ( $p \leq 0,001$ ) perdurant 6 semaines après l'hospitalisation. Le groupe art-thérapie (versus non art-thérapie) montre une augmentation des indicateurs de créativité quantitatifs et qualitatifs au cours et après hospitalisation. En revanche, le groupe sans art-thérapie connaît une diminution constante, pendant et après hospitalisation, de tous les scores de créativité quantitatifs et qualitatifs. **Conclusion :** L'Art-thérapie contribue au développement du potentiel créatif pendant et après un programme TPE de 2 semaines pour patients obèses. L'art-thérapie devrait être incluse dans les programmes d'éducation thérapeutique pour patients obèses.

**Mots clés :** art-thérapie / éducation thérapeutique / créativité / obésité / qualité de vie

## 1 Introduction

A variety of programmes are proposed for obesity management. A long-term follow-up based on a multi- and

interdisciplinary approach is mandatory [1–5]. In this context and parallel to the different “self-help” programs [6], therapeutic patient education (TPE) constitutes the basis of care for patients suffering from obesity [7–9].

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TPE involves a multiplicity of medical, dietetic, psychotherapeutic, and pedagogical approaches that are aimed at mobilizing the potential of the patient to become the principle actor of her or his health. Art therapy (AT) is a form of treatment using creativity in the therapeutic process. Through this approach, patients may express their feelings and suffering in a different way by using symbolism, image, colors, etc. When using this creative process, patients become connected with their sensitive and emotional sides, as well as their resources, and potential. AT by means of artistic mediation has become one of these tools that is intuitively perceived and recognized as a vector in a process of appropriation, responsibility, and autonomy of the obese patient in the TPE programs [10–12]. These practices have not yet been evaluated in terms of effectiveness.

This lack of evaluation is partly due to several difficulties. First of all, an artistic approach ensures an institutional visibility without having to evaluate the scientific level [13]. Moreover, there is confusion between AT (based on a final output without any esthetical result) on one hand and the expression of feeling and verbalization on the other [14–16]. Thus, the evaluation of the artistic dimension, and specifically AT, appears difficult [17, 18].

Scientific evaluations of AT are mainly focused on specific psychological aspects (self-esteem, body image, quality of life, depression, and anxiety). However, creativity has not been measured in the obesity field [19–21].

The place and impact of the practices used in TPE for obese patients are poorly understood. However, our previous work [12, 22] using an experimental methodology in a natural environment based on a standardized and manual AT technique showed a quantitative and qualitative improvement in self-esteem, self-awareness, and potential of the individual person in a population of 14 obese subjects. In the field of eating disorders, one meta-analysis of 19 programs integrating the art-based therapies revealed the absence of a valid experimental study design justifying and generalizing the use of such practices without standardized contents [23].

The objective of our study was to evaluate the efficacy of AT workshops combined with a 2-week in-hospital TPE program for obese patients.

Creativity and artistic sensitivity were mainly evaluated in the two groups with and without AT sessions.

## 2 Subjects and methods

Among 437 obese patients who previously participated in a 2-week in-hospital TPE program between 2005 and 2007 in the Service for Therapeutic Patient Education for Chronic Diseases, University Hospitals of Geneva, Switzerland and in the Clinic Château de Vernhes, France, we selected 259 obese patients without type 2 diabetes mellitus. The two centres used the same approach for obesity treatment [12].

The exclusion criteria were the following: diabetes, personality disorder diagnosis according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), presence of any antipsychotic or personality disorder requiring treatment,

**Table I.** Bio-psycho-social characteristics of the groups with and without art-therapy. – *Caractéristiques bio-psycho-sociales des groupes avec et sans art-thérapie.*

|                          | Group 1<br>TPE without AT | Group 2<br>TPE with AT |
|--------------------------|---------------------------|------------------------|
| N                        | 74                        | 96                     |
| Age                      | 54.5 (+ 9.7)              | 55.4 (+ 10.3)          |
| Sex                      |                           |                        |
| - Men                    | 24.3%                     | 20.8%                  |
| - Women                  | 75.7%                     | 79.2%                  |
| Body Weight (kg)         | 101.3 (+ 22.1)            | 105.5 (+ 21.2)         |
| BMI (kg/m <sup>2</sup> ) | 37.5 (+ 7.8)              | 39.3 (+ 7.6)           |
| Diploma                  |                           |                        |
| - None                   | 8.1%                      | 7.3%                   |
| - Primary                | 9.5%                      | 9.4%                   |
| - Secondary              | 35%                       | 45.8%                  |
| - Maturity               | 17.6%                     | 10.4%                  |
| - University             | 29.8%                     | 27.1%                  |
| Profession               |                           |                        |
| - None                   | 37.8%                     | 43.8%                  |
| - Non executive          | 33.8%                     | 35.4%                  |
| - Executive              | 28.4%                     | 20.8%                  |
| Emotional life           |                           |                        |
| - Alone                  | 43.2%                     | 39.6%                  |
| - Married/couple         | 56.8%                     | 60.4%                  |

and the use of non-stabilized antidepressant or anti-anxiety treatment for less than 6 months.

According to the use of AT during the 2-week in-hospital TPE program or not, patients were randomized into two groups: Group 1 without AT (TPE without AT) and Group 2 with AT (TPE with AT). After eliminating drop-outs, a total of 170 patients were included in the final analyses (Group 1:  $n = 74$ ; Group 2:  $n = 96$ ). The two groups did not show any differences in terms of bio-psycho-social parameters (Tab. I).

### 2.1 Content of AT sessions

AT sessions were based on clinical observation [11, 12, 22] and the existing literature [19, 24]. The main objective of the AT workshops (sensory and pictorial) was to put the patient in movement in order to allow him/her to develop a better self-body image. The second aim was to obtain a more easy expression of feelings and emotions, while the third aim was to build up social links with others.

The 2-week TPE program included five structured and standardized AT sessions [22]. Similar structured and standardized AT sessions were proposed by two art therapists using the same methodological approach. The duration of each session was two hours, and the topics of each workshop were as follows: “how do I feel in the here and now?”; “what are my obstacles and difficulties?”; “what is my potential?”; “what are my projects?”; “what links can I establish between the works I accomplished?”

These topics were proposed by two art therapists as a support to initiate the creations. They were presented in a creative way, e.g., based on a figure or image, a tale or account, a sentence or citation. Each meeting was structured in three parts, beginning with the reception to working with the matter (realization of a production), and finally, to a verbalization of the pictorial expression. The succession of these three phases provided the content and framework for each session, which used several objects as mediators (painting, ground, joining, etc.) and situations mediated on a continuum. As the patients were hospitalized, all of them attended and completed the five sessions.

### 2.2 Tools for evaluation

*Torrance Tests of Creative Thinking (TTCT)* [25] are based on divergent thought. This assessment contains seven play-tests of verbal expression and three play-tests of illustrated expression. Based on our previous work [26], we retained two of them: “To finish a drawing” and “To create a drawing with parallel lines”. The first play-test comprised 10 items and the second 30. Each of them measured the fluidity (aptitude of the subject to produce a large number of ideas), flexibility (aptitude to produce varied answers in different fields), development (aptitude to develop, widen, and embellish ideas), and originality (aptitude to produce ideas distant from the obvious, commonplace, banal, and bench). A quantitative score was provided for all the parameters, with the total creativity score representing the sum of fluidity, flexibility, development, and originality.

From *The Clinical Scale of Mediatized Therapies* [26], we extracted six qualitative questions concerning *artistic sensitivity, interest in creation/expression, perseverance in an old activity, investment in projects, and new activities*. A quantitative score was proposed, which was associated with a qualitative analysis of the answers.

### 2.3 Procedure

Patients enrolled in the study were evaluated three times: at baseline (T0) at the beginning of TPE program before the AT sessions, after the 2-week TPE program (T1), and at follow-up 6 weeks after the end of the TPE program (T2). At T0 and T1, patients filled in questionnaires, which were anonymously analyzed.

Six weeks after the 2-week in-hospital TPE program (T2), questionnaires were sent to patients by post. A systematic mail recall was sent 8 days after initially sending the questionnaires. Only 56 out of 79 in the TPE program without AT and 82 out of 96 returned the questionnaire after 6 weeks in the program with AT.

### 2.4 Statistical analyses

After examining homogeneity and superposition (T0), normality, presence of extreme data (uni- and multivariate), multicollinearity, and singularity, analyses were performed using

the analysis of variance (ANOVA) for repeated measures with SPSS 15<sup>®</sup>.

## 3 Results

### 3.1 Body weight

Body weight and body mass index (BMI) decreased significantly during the 2-week TPE program ( $p < 0.001$ ) in both groups, without any interaction between them. No statistically significant effect of AT was observed in terms of body weight or gender.

### 3.2 Parameters of creativity (Tab. II)

*Fluidity* changed significantly during the TPE program ( $p < 0.05$ ). Subjects from the TPE with AT group showed a significant increase in fluidity at T1 as compared to T0 ( $p = 0.04$ ). We observed a slightly diminished score in fluidity at T2 as compared to T1, but this score at T2 remained largely above its initial level at T0. Subjects from the TPE without AT group exhibited a linear not statistically significant decrease in the fluidity score during the TPE program.

*Flexibility* improved significantly during the TPE program with AT ( $p < 0.01$ ). There was a significant difference ( $p < 0.005$ ) between T0 and T1. Moreover, the flexibility of the TPE without AT group did not improve between T0 and T1, but was less effective afterwards. However, for the TPE with AT group, the improvement of flexibility remained largely better as compared to the initial level at T0.

*Development*. There was a significant difference between the groups, especially between T0 and T1 in favour of TPE with AT group ( $p < 0.03$ ). We observed a slightly diminished score of development at T2 as compared to T1 ( $p = 0.03$ ), but this score at T2 remained largely above its initial level at T0. Subjects from the TPE without AT group showed a significant decrease in the development score during the TPE program ( $p < 0.01$ ).

*Originality*. There was a significant difference between the two groups ( $p < 0.02$ ), especially between T0 and T1 in favour of TPE with AT group. In this group, we observed an increased score in originality at T1 as compared to T0 ( $p = 0.02$ ), with this score being slightly diminished at T2, but remaining largely above its initial level at T0. Subjects from the TPE without AT group showed a non statistically significant decrease in the originality score during the TPE program.

*Total creativity*, which represents the sum of fluidity, flexibility, development, and originality, changed significantly in both groups. There was a significant difference between the two groups ( $p < 0.02$ ), especially between T0 and T1 in favour of TPE with AT group (Fig. 1). In this group, we observed an increased score in total creativity at T1 as compared to T0 ( $p = 0.001$ ), this score being slightly diminished at T2, but remaining largely above its initial level at T0. Subjects from the TPE without AT group showed a non statistically significant decrease in total creativity score during the TPE program.



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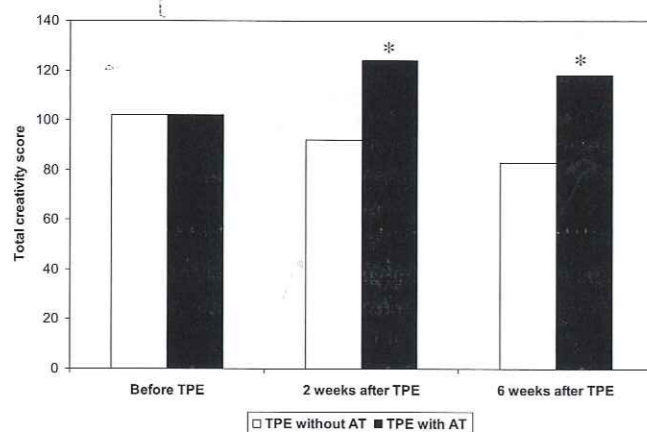
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**Table II.** Effects of art-therapy on body weight and creativity. – *Effets de l'art-thérapie sur les variables poids et créativité.*

|                          | T0           | T1           | T2           | F inter-subjects | p value | $\eta^2p$ |
|--------------------------|--------------|--------------|--------------|------------------|---------|-----------|
| Body Weight (kg)         |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 101.3 (22.1) | 98.4 (21.4)  | 95.1 (20.6)  | 1.50             | 0.22    | 0.009     |
| Group 2 (TPE with AT)    | 105.5 (21.8) | 102.3 (20.8) | 99.0 (19.9)  |                  |         |           |
| BMI (kg/m <sup>2</sup> ) |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 37.5 (7.8)   | 36.4 (7.5)   | 35.2 (7.3)   | 2.17             | 0.14    | 0.013     |
| Group 2 (TPE with AT)    | 39.3 (7.6)   | 38.1 (7.2)   | 36.9 (6.9)   |                  |         |           |
| Fluidity                 |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 22.5 (12.7)  | 21.4 (13.1)  | 20.2 (13.4)  | 4.28             | 0.04    | 0.025     |
| Group 2 (TPE with AT)    | 22.7 (13.9)  | 27.1 (12.8)  | 26.1 (13.6)  |                  |         |           |
| Flexibility              |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 16.4 (7.9)   | 16.8 (12.4)  | 14.3 (8.2)   | 3.14             | 0.07    | 0.018     |
| Group 2 (TPE with AT)    | 16.6 (9.6)   | 19.3 (8.5)   | 18.5 (9.0)   |                  |         |           |
| Originality              |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 31.0 (22.5)  | 29.0 (22.8)  | 28.2 (23.8)  | 5.23             | 0.02    | 0.030     |
| Group 2 (TPE with AT)    | 31.6 (24.0)  | 40.7 (24.9)  | 39.4 (25.7)  |                  |         |           |
| Development              |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 31.9 (34.9)  | 24.7 (25.4)  | 20.0 (22.2)  | 4.50             | 0.03    | 0.026     |
| Group 2 (TPE with AT)    | 30.6 (28.3)  | 37.6 (30.1)  | 34.7 (29.2)  |                  |         |           |
| Total creativity         |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 102.0 (66.1) | 92.2 (62.8)  | 82.9 (61.3)  | 5.40             | 0.02    | 0.031     |
| Group 2 (TPE with AT)    | 102.3 (69.8) | 124.1 (68.3) | 118.0 (71.1) |                  |         |           |

T0 = initial; T1 = 2 weeks after TPE program; T2 = 6 weeks after TPE program; P value represents the difference between the two groups with and without AT;  $p < 0.05$  was considered statistically significant.



**Figure 1.** Total creativity score before and after the TPE program with and without art-therapy. – *Score total de créativité avant et après le programme d'éducation thérapeutique avec et sans art-thérapie.*  $P < 0.001$  before and after TPE with art-therapy. The difference between both groups ( $p = 0.02$ ;  $F = 5.4$ ) was statistically significant.

### 3.3 Artistic sensitivity parameters (Tab. III)

#### 3.3.1 Artistic sensitivity

Artistic sensitivity improved significantly in the group with AT compared to the control group without AT ( $p < 0.001$ ).

There was a significant difference, especially between T1 and T2 in AT group ( $p = 0.03$ ).

#### 3.3.2 Interest in creation/expression

A significant difference was observed, particularly between T0 – T1 and T1 – T2 ( $p = 0.009$ ). Subjects from the TPE with AT group showed a highly significant increase in creation/expression ( $p < 0.0001$ ) at T1 and T2 when compared to T0. An inverse non-significant relationship between T1 and T2 was found in the TPE without AT group.

#### 3.3.3 The desire to create

The desire to creativity changed significantly between the 2 groups ( $p < 0.001$ ). Subjects from the TPE with AT group showed a significant increase in creative desire. The score decreased, however, between T1 and T2, without reaching the values at T0. An inverse relationship was found in the TPE without AT group, with the score at T2 being lower than at T0.

#### 3.3.4 Continuous activities

Subjects from the TPE with AT group showed a less pronounced reduction in continuous activities as compared to the TPE without AT group ( $p < 0.001$ ).

**Table III.** Effects of art-therapy on artistic-creative parameters. – *Effets de l'art-thérapie sur les variables artistico-créatives.*

|                          | T0        | T1        | T2        | F inter-subjects | p value | $\eta^2p$ |
|--------------------------|-----------|-----------|-----------|------------------|---------|-----------|
| Artistic sensitivity     |           |           |           |                  |         |           |
| Group 1 (TPE without AT) | 0.5 (0.5) | 0.5 (0.4) | 0.5 (0.5) | 13.85            | 0.001   | 0.076     |
| Group 2 (TPE with AT)    | 0.6 (0.4) | 0.7 (0.4) | 0.8 (0.3) |                  |         |           |
| Creation/expression      |           |           |           |                  |         |           |
| Group 1 (TPE without AT) | 0.4 (0.5) | 0.4 (0.5) | 0.3 (0.4) | 22.82            | 0.001   | 0.120     |
| Group 2 (TPE with AT)    | 0.6 (0.4) | 0.7 (0.4) | 0.7 (0.4) |                  |         |           |
| Desire to create         |           |           |           |                  |         |           |
| Group 1 (TPE without AT) | 0.4 (0.4) | 0.4 (0.5) | 0.4 (0.4) | 11.33            | 0.001   | 0.063     |
| Group 2 (TPE with AT)    | 0.6 (0.4) | 0.6 (0.4) | 0.6 (0.4) |                  |         |           |
| Continuous activities    |           |           |           |                  |         |           |
| Group 1 (TPE without AT) | —         | 0.2 (0.4) | 0.2 (0.4) | 12.27            | 0.001   | 0.068     |
| Group 2 (TPE with AT)    | —         | 0.4 (0.5) | 0.4 (0.5) |                  |         |           |
| New activities           |           |           |           |                  |         |           |
| Group 1 (TPE without AT) | —         | 0.3 (0.4) | 0.2 (0.4) | 4.12             | 0.04    | 0.024     |
| Group 2 (TPE with AT)    | —         | 0.3 (0.4) | 0.4 (0.4) |                  |         |           |
| Projects                 |           |           |           |                  |         |           |
| Group 1 (TPE without AT) | —         | 0.3 (0.4) | 0.3 (0.4) | 6.05             | 0.01    | 0.035     |
| Group 2 (TPE with AT)    | —         | 0.4 (0.5) | 0.5 (0.5) |                  |         |           |

T0 = initial; T1 = 2 weeks after TPE program; T2 = 6 weeks after TPE program. P value represents the difference between the two groups with and without AT;  $p < 0.05$  was considered statistically significant.

#### 3.3.5 New activities

Subjects from the TPE with AT group showed a significantly increased score for new activities ( $p = 0.04$ ), whereas the TPE without AT group showed non significant changes.

#### 3.3.6 Projects

Subjects from the TPE with AT group showed a significantly increased involvement in project development ( $p < 0.01$ ), whereas the TPE without AT group exhibited no changes.

## 4 Discussion and conclusion

### 4.1 Discussion

The participation in a 2-week in-hospital TPE program for obese patients induced a significant weight loss in both groups (TPE without AT as well as TPE with AT), which persisted 6 weeks after the end of the TPE program.

However, taking into account the majority of reports underlining a post-treatment weight regain of 30 to 50% of the initial weight loss, the weight loss observed in our study should be interpreted with caution. However, our multidisciplinary, holistic, and personalized TPE approach aimed to limit the weight regain and obesity-related comorbidities according to the meta-analysis of Turk *et al.* [5].

No additional effect of art therapy on body weight was noted in our study. However, this was not the aim of the study. This observation is in line with the study of Rouch *et al.* [28] comparing interpersonal psychotherapy and the classical medical and dietetic approach. The weight outcome was similar in both groups. Nonetheless, body weight loss should not be the only assessment parameter in weight loss programs.

Overall, the group with AT showed an increase in creativity during the 2-week in-hospital TPE program. This effect was maintained after the end of the program on a level largely higher than before the program. Moreover, this dynamic movement was corroborated by all of the related variables (artistic sensitivity, interest in creation/expression, and creative desire).

On the other hand, the group without AT showed a decrease in creativity. The interest in creation/expression and creative desire increased slightly during hospitalization, but reached a lower level after hospitalization as compared to before the 2-week TPE program.

In other words, the obese patients participating in the TPE program without AT lost similar body weight while losing elsewhere, particularly in terms of creativity, imagination, and opening to the world.

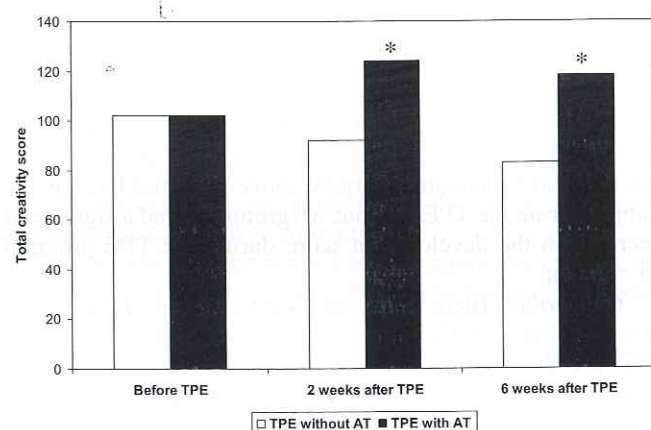
To explain this loss of creativity in patients participating in the in-hospital TPE program without AT, we may hypothesize that these patients participated in a training process involving a high cognitive and emotional level. During the TPE program, patients followed different educational workshops enabling them to modify some behaviour (food structure, physical activity, *etc.*). After hospitalization, they put these new behaviours into practice in their daily activities. It is possible that in this



**Table II.** Effects of art-therapy on body weight and creativity. – *Effets de l'art-thérapie sur les variables poids et créativité.*

|                          | T0           | T1           | T2           | F inter-subjects | p value | $\eta^2p$ |
|--------------------------|--------------|--------------|--------------|------------------|---------|-----------|
| Body Weight (kg)         |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 101.3 (22.1) | 98.4 (21.4)  | 95.1 (20.6)  | 1.50             | 0.22    | 0.009     |
| Group 2 (TPE with AT)    | 105.5 (21.8) | 102.3 (20.8) | 99.0 (19.9)  |                  |         |           |
| BMI (kg/m <sup>2</sup> ) |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 37.5 (7.8)   | 36.4 (7.5)   | 35.2 (7.3)   | 2.17             | 0.14    | 0.013     |
| Group 2 (TPE with AT)    | 39.3 (7.6)   | 38.1 (7.2)   | 36.9 (6.9)   |                  |         |           |
| Fluidity                 |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 22.5 (12.7)  | 21.4 (13.1)  | 20.2 (13.4)  | 4.28             | 0.04    | 0.025     |
| Group 2 (TPE with AT)    | 22.7 (13.9)  | 27.1 (12.8)  | 26.1 (13.6)  |                  |         |           |
| Flexibility              |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 16.4 (7.9)   | 16.8 (12.4)  | 14.3 (8.2)   | 3.14             | 0.07    | 0.018     |
| Group 2 (TPE with AT)    | 16.6 (9.6)   | 19.3 (8.5)   | 18.5 (9.0)   |                  |         |           |
| Originality              |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 31.0 (22.5)  | 29.0 (22.8)  | 28.2 (23.8)  | 5.23             | 0.02    | 0.030     |
| Group 2 (TPE with AT)    | 31.6 (24.0)  | 40.7 (24.9)  | 39.4 (25.7)  |                  |         |           |
| Development              |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 31.9 (34.9)  | 24.7 (25.4)  | 20.0 (22.2)  | 4.50             | 0.03    | 0.026     |
| Group 2 (TPE with AT)    | 30.6 (28.3)  | 37.6 (30.1)  | 34.7 (29.2)  |                  |         |           |
| Total creativity         |              |              |              |                  |         |           |
| Group 1 (TPE without AT) | 102.0 (66.1) | 92.2 (62.8)  | 82.9 (61.3)  | 5.40             | 0.02    | 0.031     |
| Group 2 (TPE with AT)    | 102.3 (69.8) | 124.1 (68.3) | 118.0 (71.1) |                  |         |           |

T0 = initial; T1 = 2 weeks after TPE program; T2 = 6 weeks after TPE program; *P* value represents the difference between the two groups with and without AT; *p* < 0.05 was considered statistically significant.



**Figure 1.** Total creativity score before and after the TPE program with and without art-therapy. – *Score total de créativité avant et après le programme d'éducation thérapeutique avec et sans art-thérapie.* *P* < 0.001 before and after TPE with art-therapy. The difference between both groups (*p* = 0.02; *F* = 5.4) was statistically significant.

### 3.3 Artistic sensitivity parameters (Tab. III)

#### 3.3.1 Artistic sensitivity

Artistic sensitivity improved significantly in the group with AT compared to the control group without AT (*p* < 0.001).

There was a significant difference, especially between T1 and T2 in AT group (*p* = 0.03).

#### 3.3.2 Interest in creation/expression

A significant difference was observed, particularly between T0 – T1 and T1 – T2 (*p* = 0.009). Subjects from the TPE with AT group showed a highly significant increase in creation/expression (*p* < 0.0001) at T1 and T2 when compared to T0. An inverse non-significant relationship between T1 and T2 was found in the TPE without AT group.

#### 3.3.3 The desire to create

The desire to creativity changed significantly between the 2 groups (*p* < 0.001). Subjects from the TPE with AT group showed a significant increase in creative desire. The score decreased, however, between T1 and T2, without reaching the values at T0. An inverse relationship was found in the TPE without AT group, with the score at T2 being lower than at T0.

#### 3.3.4 Continuous activities

Subjects from the TPE with AT group showed a less pronounced reduction in continuous activities as compared to the TPE without AT group (*p* < 0.001).

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| Artistic sensitivity     |           |           |           |                  |         |           |
| Group 1 (TPE without AT) | 0.5 (0.5) | 0.5 (0.4) | 0.5 (0.5) | 13.85            | 0.001   | 0.076     |
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| Group 1 (TPE without AT) | 0.4 (0.5) | 0.4 (0.5) | 0.3 (0.4) | 22.82            | 0.001   | 0.120     |
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| Desire to create         |           |           |           |                  |         |           |
| Group 1 (TPE without AT) | 0.4 (0.4) | 0.4 (0.5) | 0.4 (0.4) | 11.33            | 0.001   | 0.063     |
| Group 2 (TPE with AT)    | 0.6 (0.4) | 0.6 (0.4) | 0.6 (0.4) |                  |         |           |
| Continuous activities    |           |           |           |                  |         |           |
| Group 1 (TPE without AT) | —         | 0.2 (0.4) | 0.2 (0.4) | 12.27            | 0.001   | 0.068     |
| Group 2 (TPE with AT)    | —         | 0.4 (0.5) | 0.4 (0.5) |                  |         |           |
| New activities           |           |           |           |                  |         |           |
| Group 1 (TPE without AT) | —         | 0.3 (0.4) | 0.2 (0.4) | 4.12             | 0.04    | 0.024     |
| Group 2 (TPE with AT)    | —         | 0.3 (0.4) | 0.4 (0.4) |                  |         |           |
| Projects                 |           |           |           |                  |         |           |
| Group 1 (TPE without AT) | —         | 0.3 (0.4) | 0.3 (0.4) | 6.05             | 0.01    | 0.035     |
| Group 2 (TPE with AT)    | —         | 0.4 (0.5) | 0.5 (0.5) |                  |         |           |

T0 = initial; T1 = 2 weeks after TPE program; T2 = 6 weeks after TPE program. *P* value represents the difference between the two groups with and without AT; *p* < 0.05 was considered statistically significant.

#### 3.3.5 New activities

Subjects from the TPE with AT group showed a significantly increased score for new activities (*p* = 0.04), whereas the TPE without AT group showed non significant changes.

#### 3.3.6 Projects

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## 4 Discussion and conclusion

### 4.1 Discussion

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However, taking into account the majority of reports underlining a post-treatment weight regain of 30 to 50% of the initial weight loss, the weight loss observed in our study should be interpreted with caution. However, our multidisciplinary, holistic, and personalized TPE approach aimed to limit the weight regain and obesity-related comorbidities according to the meta-analysis of Turk *et al.* [5].

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In other words, the obese patients participating in the TPE program without AT lost similar body weight while losing elsewhere, particularly in terms of creativity, imagination, and opening to the world.

To explain this loss of creativity in patients participating in the in-hospital TPE program without AT, we may hypothesize that these patients participated in a training process involving a high cognitive and emotional level. During the TPE program, patients followed different educational workshops enabling them to modify some behaviour (food structure, physical activity, *etc.*). After hospitalization, they put these new behaviours into practice in their daily activities. It is possible that in this



context, there was little place left for creativity. Many TPE programs are focused on knowledge, skill improvement, and behavioural modifications without working on perception and creative dimensions [29]. AT could therefore play an important role in the field of self-esteem and body image.

The introduction of an AT workshop in a TPE program for obese patients brings creativity into the rational medical world and could thus reinforce the communication and autonomy of the obese.

## 4.2 Conclusion

AT workshops contribute to the development of creative potential during and following the 2-week TPE in-hospital program. The absence of AT led to a fall of the creativity, even more accentuated following hospitalization and independent of weight loss. Structured, manual, and standardized AT organized by specialists in the field should be proposed in combination with therapeutic patient education for obese patients.

*Conflicts of interest.* The authors declare no conflict of interest.

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## References

- Painot D, Morel Y, Golay A. Cognitive-behavioral treatment and obesity. *J Behav Cogn Ther* 1998; 8:3-7.
- Dixon JB, Dixon ME. Combined strategies in the management of obesity. *Asia Pac J Clin Nutr* 2006; 15:63-69.
- Aronne LJ, Wadden T, Isoldi KK, Woodworth KA. When fails prevention: obesity treatment strategies. *Am J Med* 2009; 122:24-32.
- Thande NRK, Hurstak EE, Sciacca RE, Giardina EG. Management of obesity: challenge for medical training and practice. *Obesity* 2008; 17:107-113.
- Turk MW, Yang K, Hravnak M, Sereika SM, Burke LE. Randomized clinical trials of weight loss maintenance: review. *J Cardiovasc Nurs* 2009; 24:58-80.
- Latner JD, Wilson GT. *Coil-help approaches for obesity and eating disorders*. New York: The Guilford Near, 2007.
- D' Ivernois JF, Gagnayre R. To learn how to educate the patient. Teaching approach. Paris: Maloine; 2004.
- Lamazière MD, Morel F. Educational assumption of responsibility of obesity. *Objective Care* 2005; 136:26-30.
- Simon D, Traynard PY, Bourdillon F, Grimaldi A. Therapeutic education. Prevention and chronic diseases. Paris: Masson, 2007.
- Kronick DM. Development of an art therapy program and other twelve step programs. *Essay Abstracts International* 1998; 58:4455.
- Haenni C, Anzules C, Assal E, Malavia M, Assal JP, Golay A. Program Art and Therapy in the care: a new approach for the follow-up of our patients. *Medicine and Hygiene* 2004; 2484:1135-1136.
- Anzules C, Haenni C, Golay A. Year experiment of art therapy for patient suffering from obesity. *Eur Nurs Diab* 2007; 4:72-76.
- Granny Y. Culture at the hospital. *Company Health* 2001; 36:17-27.
- Deane K, Carman M, Fitch M. The cancer journey:bridging art therapy and museum education. *Can Oncol Nurs J* 2000; 10(4):140-143.
- Pellecchia HAS, Gagnayre R. Art and Disease: prospect for therapeutic education. *Education of the Patient and Stakes of Health* 2004; 22:79-84.
- Pellecchia HAS, Gagnayre R. L'art comme outil pédagogique dans l'éducation thérapeutique du patient. In : *Le rôle de l'art dans les éducations en santé*, Paul P, Gagnayre R (Eds), Paris: L'Harmattan; 2008, p. 7-18.
- Tessier S. The evaluation of the creative practices or need for the lure. *The Health of the Man* 1999; 344:37-38.
- Puetz TW, Morley CA, Herring MP. Effects of creative arts therapies on psychological symptoms and quality of life in patients with cancer. *JAMA Intern Med* 2013; 173:960-969.
- Rubin JA. *Approaches to art therapy: therapy and technical*. Philadelphia: Brunner-Routledge, 2001.
- Malchiodi C. *Handbook of art therapy*. New York: Guilford Near, 2003.
- Sudres JL. Evaluation in art-therapy ? Reports in futurologies. In: *The evaluation in art-therapy. International practices*, Forester R. (Ed), Paris: Elsevier; 2007, p. 105-110.
- Anzules C, Haenni C, Golay A: An experiment in art-therapy for patients suffering from obesity. In : *Le rôle de l'art dans les éducations en santé*, Paul P, Gagnayre R (Eds), Paris: Harmattan; 2008, p. 19-33.
- Frisch MJ, Franko DL, Herzog DB. Art-based therapies in the treatment of eating disorders. *Eat Disord* 2006; 14:131-142.
- Graham-Pole J. *Illness and the art off creative coil-expression stories and exercises from the arts for those with chronic illness*. Oakland: New Harbinger Publications; 2000.
- Torrance EP. *Torrance tests of creative thinking. Norms technical manual*. Princeton: Personnel Close Gin and Co; 1974.
- Sudres JL, Fourasté R, Moron P. Plea for a private clinic armed with the art-therapy: between psychometry and evaluation. *French Review of Psychiatry and Medical Psychology* 1997; 8:91-93.
- Sudres JL. Clinical scale of mediatized therapies (drawing - painting - modelling - joining). *ECTM - Issy Moulineaux: EAP*; 1993.
- Rouch V, Schmitt L. Interpersonal psychotherapy at the resistant obese subjects. *Medico-Psychological Annals* 2001; 159:234-240.
- Gori R, Del Volgo MJ. *Totalitarian health. Test on the medicalisation of the existence*. Paris: Denoël; 2005.