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Original/*Obesidad*

The variability in adherence to dietary treatment and quality of weight loss: overweight and obesity

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Abstract

Objective: Observation of weight loss and the maximum time that individualized dietary treatment qualitative and quantitative is shown to be effective.

Method: 4625 consultations were conducted with 616 patients over 25 years old, in the nutrition consultation, using the qualitative and quantitative individualized dietary treatment. As a result we controlled the weight loss, the fat and the quality and variability of the loss, monthly according to sex, age and BMI in an urban area of southeastern Spain.

Results and discussion: A low level of abandonment was proved in men, patients older than 45 years old compared to obese showed a higher degree. The quality of the loss was greater in men under 45 years old, overweight patients, however, more research is needed in this area. Measuring the waist and hips has led to an increasing interest in measuring indicators of body fat.

Conclusion: The individualized dietary treatment has been proved to be effective for six months and then a multidisciplinary mode of this treatment is recommended. The use of new ways to assess weight loss is proposed taking into consideration the quality and variability of loss, regardless of the treatment used.

(*Nutr Hosp.* 2015;31:2017-2024)

DOI:10.3305/nh.2015.31.5.8648

Key words: *Weight loss. Obesity. Diet and adherence.*

LA VARIABILIDAD EN LA ADHERENCIA AL TRATAMIENTO DIETÉTICO Y LA CALIDAD DE LA PÉRDIDA DE PESO: EL SOBREPESO Y LA OBESIDAD

Resumen

Objetivo: Observación de la pérdida de peso y el tiempo máximo que se muestra el tratamiento dietético individualizado cuali-cuantitativo para ser eficaz.

Método: 4625 consultas se llevaron a cabo con 616 pacientes mayores de 25 años, en la consulta de nutrición, utilizando la herramienta de tratamiento dietético individualizado cuali-cuantitativo, como resultado se controló la pérdida de peso, la grasa, la calidad y la variabilidad de la pérdida, mensualmente en función del sexo, la edad y el IMC en una zona urbana del sureste de España.

Resultados y discusión: Se demostró un bajo nivel de abandono en los hombres, en los pacientes mayores de 45 años, frente a los obesos que mostraron un mayor grado. La calidad de la pérdida fue mayor en los hombres, los menores de 45 años, los pacientes con sobrepeso, sin embargo, se necesita más investigación en esta área. La medición de la cintura y las caderas ha llevado a un creciente interés en los indicadores de medición de grasa corporal.

Conclusión: El tratamiento dietético individualizado ha demostrado ser eficaz en los seis meses y, posteriormente, se recomienda su uso en el modo multidisciplinario. Se propone el uso de nuevas formas de evaluar la pérdida de peso: la calidad y la variabilidad de la pérdida, independientemente del tratamiento utilizado.

(*Nutr Hosp.* 2015;31:2017-2024)

DOI:10.3305/nh.2015.31.5.8648

Palabras clave: *Pérdida de peso. La obesidad. La dieta y la adherencia.*

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Recibido: 9-I-2015.

Aceptado: 15-II-2015.

Introduction

Body composition and fat mass

Weight gain corresponding to increased adipose deposits has a negative effect on health, including a greater prevalence of mortality, and a wide range of chronic diseases, thus contributing to poorer quality of life¹. This research evaluated weight and fat loss and the quality of the weight lost. Some authors noted that not all weight loss provides these health improvements, however the reduction of the proportion of body fat can be of greater significance. Therefore, intervention in weight loss should focus on the loss of body fat^{2,3}.

Treatment of loss, adherence and abandonment

This clinical trial is based on the ongoing learning process as a stimulus for the patient, suggesting that said process will assist in reducing levels of abandonment⁴. For this purpose individualised dietary treatment of weight and fat loss was monitored, based on the time spent in the clinic, sex, age, BMI and quality of weight loss. This type of study may contribute to a possible improvement in the lines of the research relating to obesity, as recommended by the EASO_SAB report. Furthermore, this line of research may provide a response to simple and transversal questions which could be raised in respect of any weight loss method⁵

Theoretical Framework

Obesity at a global level continues to rise, as recent studies have shown, with an average increase in body mass index (BMI) of 0.4 kg/m per decade from 1980 and Spain is no exception. There has been an enormous increase in new weight loss treatments, many of which have not been compared and contrasted and perhaps this is not the most appropriate course of action³. Improvements in life style and eating habits can be addressed in many ways however, but the most interesting objective is to achieve a healthy weight and to ensure that said weight change is maintained over time⁶⁻⁸. Some authors mention the difficulty in adapting to the changes made, a concept known as “adherence to treatment”⁹. Abandonment is the most frequent cause, at times accounting for up to 68% of grounds for failure of the treatment^{10,11}. Such a high rate of abandonment may be motivated by: ignorance of the treatment, strategies which are not adapted to the patient’s level of excess weight¹², women are more interested in altering their weight together with their life style, and thus their weight loss goals are not realistic¹¹. It is recommended that concerted goals and strategies are followed in the chosen treatment¹³.

Purpose of the Study

Monthly weight loss variability was observed, determining the maximum recommended duration for use of the individualised dietary treatment and proposing new forms of expression for the effectiveness of weight lost for any weight loss method.

Material and methods

Participants

Weight and fat loss were analysed in an individualised manner in a total of 616 patients, generating 4625 nutrition consultations in an urban area of south eastern Spain, for a period from 2006 -2012.

The selection criteria applied were: ≥ 25 years of age¹⁴; with a body mass index equal to or greater than 25 kg/m², divided into two groups: overweight (BMI: 25-30 kg/m²) and obesity (BMI: ≥ 30 kg/m²)¹⁵; without allergies, or known food intolerances; without incapacitating psychomotor or comprehension conditions and carrying out the dietary recommendations given; and to agree to participate in this study. And as criteria for exclusion, all those patients who failed to comply with the foregoing conditions; those who have a pacemaker type device fitted; who have undergone corrective surgery for morbid obesity (bariatric surgery, fitting of gastric band or balloon or other similar devices); those who request food replacement or dietary supplements and/or drugs; patients who required ovo-lacto-vegetarian diets or others outside the recommendations of nutritional intervention based on the food pyramid; and patients who need controlled diets due to metabolic diseases or specific intolerances, low gluten, hyperphenylalaninemia, purine metabolism disorders, diabetes etc.

Individualised measurement of body weight of the patients in the consulting room

For weighing and calculation of the body fat the Tanita BC-418MA body composition analysis was used (TANITA, Corporation of America, Arlington Heights, IL, USA) For the weighing process the following preliminary recommendations were followed: a homogeneous weighing timetable; no previous physical exercise that day; avoidance of excessive water consumption; and furthermore, in the event that the subject is being treated with diuretics, the dose should not usually vary.

Every two weeks, in each individualised consultation the anthropometric parameters of body weight and body mass were measured over a maximum period of six months. All the anthropometric data obtained were noted in the patient’s file, and the data to be analysed were recorded on a spread sheet: treatment time, age,

sex, weight, height, fat content, based on which the initial and final BMI were calculated, the weight loss percentages and body fat with respect to the initial figures.

With respect to adherence, the patient's monthly attendance at the clinic was taken into account. For the study the patients were monitored from the start of treatment to the date of signing off, considering a maximum period of six months of treatment. An attempt was made to reduce the level of patient abandonment by facilitating communication with and greater access to the professional treating the patients¹⁶. In order to improve understanding and adaptation to the treatment, an ongoing learning process was developed divided into three stages: initiation period, perfecting phase and maintenance. During the final phase more extensive and less strict dietary guidelines were gradually introduced, particularly for weekends. These measures were agreed with the patient, and were included as part of their goals and nutritional planning⁴.

Diet as a tool for treating weight loss

This was based on a balanced diet which qualitatively and quantitatively reduces weight with recommendations for increased understanding of what that entails, and using locally grown and sourced foods. The distribution of macronutrients in said diet was based on a hypo-lipidic diet (10-15%); with proteins accounting for 15-20%; and with carbohydrates adapted to 60-65% avoiding those with a high glycaemic index. The aim was for the diet to lead to a reduction of 20-30% in terms of energy needs according to recommendations¹⁷, said energy deficit will be adapted on the basis of gradual weight loss obtained, thus ensuring a continuous loss⁴.

Parameters for assistance and interpretation of the loss

Adherence to the treatment measured as patients who remain: PCAC = patients who continue to attend the clinic.

Patients who normalise: PN = patients who have been signed off as they achieved their objective. In excess weight the goal pursued was to reach a healthy weight or normoweight¹⁵ and in the case of the obese the goal is to reach overweight status.

Patients who abandon the treatment: PDT = patients who fail to continue and who have not reached any of the goals mentioned in the PN.

Percentage of weight lost: $\%WL=100 \times (\text{Weight lost between visits to the clinic}/\text{initial weight})$.

Percentage of fat lost: $\%FL=100 \times (\text{Fat lost between visits to the clinic}/\text{initial fat})$.

Quality of loss: $QL=\%FL/\%WL$.

Variability $\%WL: V\%WL=100 \times (\%WL_{\text{total}}-\%WL_{\text{month}}) / \%WL_{\text{total}}$.

Variability $\%FL: V\%FL=100 \times (\%FL_{\text{total}}-\%FL_{\text{month}}) / \%FL_{\text{total}}$.

V%TWLS: Variability percentage of total weight loss of the sample (n=616).

V%FLTS: Variability in the percentage of fat loss total sample (n=616).

Both parameters help to assess how the weight and fat loss has been each month in relation to the total weight and fat lost. They may be used for any age group, sex, BMI and physical activity carried out. It is interpreted that at the lowest value of variability, the loss of that month was more significant with respect to the remainder of the treatment.

Statistical Analysis

The data was processed statistically using the IBM SPSS Statistics 22.0 package. Non parametric studies were used between the different subgroups as normal distribution was not available. Significations for $p<0.05$ were considered.

Results

Description of the participants

The initial sample consisted of 616 patients, the majority of whom were women (69%), aged between 25 and 44 (52%) and obese (55%) (Table I). The evolution of patients over a six month treatment period is represented monthly in figure 1. Analysing these parameters on a month by month basis, and in relation to groups of sex, age and the degree to which they are overweight or obese, it was noted that men, the over 45s and the obese displayed a greater level of abandonment. In the case of patients who were signed off because they successfully completed the treatment (they normalised) there was an alternation between under and older than 45 years, as in the case of overweight and obese, however, men showed a tendency to greater success in completing the treatment than women (Table I).

Effectiveness of the loss between variables and the treatment time

As a result of the losses obtained through attending the clinic, the aforementioned parameters are highlighted as indicated in table II. Men showed a significantly greater % of fat and weight loss than women, though this became equal after the fourth month. In the case of those under 45 years, the % of fat loss was greater than in those over 45 years which evened out as the treatment progressed. There was only a significant di-

Table I
Total sample, remaining and abandoning, according to distribution of the sample by sex, age groups and excess weight or obesity

Treatment	Men n=188	Women n=428	25-44 years n=322	>45 years n=294	Overweight n=275	Obesity n=341
1st month						
PCAC (n (%))	188(100)	424 (99,1)	319 (99,1)	293(99,7)	274 (99,6)	338(99,1)
↓ BMI < 25 (n (%))	18 (9,6)	75 (17,5)	67 (20,8)	26 (8,8)	92 (33,5)	1(0,3)
↓ BMI < 30 >25 (n (%))	45 (23,9)	57 (13,3)	47 (14,6)	55 (18,7)	NP	99 (29)
PDT (n (%))	0	4 (0,9)	3 (0,9)	1(0,3)	1 (0,4)	3 (0,9)
2nd month						
PCAC (n (%))	126 (67)	280 (65,4)	200 (62,1)	206 (70,1)	173 (62,9)	233 (68,3)
↓ BMI < 25 (n (%))	14 (7,5)	61 (14,3)	51(15,8)	24 (8,16)	74 (26,9)	1 (0,3)
↓ BMI < 30 >25 (n (%))	40 (21,3)	46 (10,7)	35 (10,9)	51 (17,3)	NP	77 (22,6)
PDT (n (%))	44 (23,4)	69 (16,1)	52 (16,1)	61 (20,7)	9 (3,3)	104 (30,5)
3rd month						
PCAC (n (%))	68 (36,2)	116 (27,1)	78 (24,2)	106 (36,1)	54 (19,6)	130 (38,1)
↓ BMI < 25 (n (%))	3 (1,6)	23 (5,4)	16 (5)	10 (3,4)	25 (9,1)	1 (0,3)
↓ BMI < 30 >25 (n (%))	29 (15,4)	28 (6,5)	23 (7,1)	34 (11,6)	NP	45 (13,2)
PDT (n (%))	44 (23,4)	103 (24,1)	71 (22)	76 (25,9)	45 (16,4)	102 (29,9)
4th month						
PCAC (n (%))	35 (18,6)	37 (8,6)	29 (9)	43 (14,6)	11 (4)	61 (17,9)
↓ BMI < 25 (n (%))	3 (1,6)	0	3 (0,9)	0	2 (0,7)	1 (0,3)
↓ BMI < 30 >25 (n (%))	16 (8,5)	14 (3,3)	11 (3,4)	19 (6,5)	NP	25 (7,3)
PDT (n (%))	30 (16)	56 (13,1)	33 (10,2)	53 (18)	18 (6,5)	68 (19,9)
5th month						
PCAC (n (%))	19 (10.1)	15 (3,5)	13 (4)	21 (7,1)	3 (1,1)	31 (9,1)
↓ BMI < 25 (n (%))	0	0	0	0	0	0
↓ BMI < 30 >25 (n (%))	11 (5,9)	7 (1,6)	7 (2,2)	11 (3,7)	NP	8 (2,3)
PDT (n (%))	13 (6,9)	22 (5,1)	13 (4)	22 (7,5)	6 (2,2)	29 (8,5)
6th month						
PCAC (n (%))	9 (4,8)	6 (1,4)	4 (1,2)	11 (3,7)	1 (0,4)	14 (4,1)
↓ BMI < 25 (n (%))	0	0	0	0	0	0
↓ BMI < 30 >25 (n (%))	4 (2,1)	2 (0,5)	2 (0,6)	4 (1,4)	NP	6 (1,8)
PDT (n (%))	10 (5,3)	9 (2,1)	9 (2,8)	10 (3,4)	2 (0,7)	17 (4,9)

BMI<25 pass to normoweight ; ↓ to BMI: Has reduced to the corresponding BMI; NP: not appropriate.

ference between those who were overweight and the obese during the first month (Table II).

In the evolution of the treatment over time, according to sex, age and BMI, the variation of %WL and %FL a considerable loss was noted up to the third month of treatment, and subsequently this diminished. The quality of loss (QL) reduced gradually as the treatment progressed in men and women over 45, however, in women over 45 it gradually increased. In

the variability of monthly weight and fat loss it may be seen that effectiveness is not as great as in previous cases, as the monthly and total loss of the treatment is taken into account. In the V%WL in men, patients aged 25 to 44 and with excess weight, the monthly loss reduced gradually however in the case of women, the patients over 45 and the obese gradually reduced the effectiveness of the loss up to the final months despite the fact that there were improvements in the final mon-

th. In the V%FL in the case of women, men, in both the overweight and the obese, the loss was gradual, however in the case of comparison by age a weight reduction was noted up to the third or fourth month (Table II). In the V%PP and V%FL of the total sample only favourable results were obtained in the first month, the same trend according to sex, age and degree of BMI (Table III).

Discussion

Strengths of the study

The following points require mention: the intervention of only one nutritionist, eliminating possible bias in interpretation; six years of data compilation which permit observation of any improvement that the treatment requires; the number of patients of both sexes, the age range, the observation period per subject and the number of consultations evaluated; the patient's access to the professional without time restrictions, the use of a personalised qualitative and quantitative diet based on locally grown foods, without any need to measure exactly the weight of the food used, which makes monitoring of the treatment easier.

Abandonment and adherence to the treatment

This research has been characterised by a low percentage of abandonment, despite the breadth of the sample and the treatment time, highlighting a higher level of men, the over 45s and the obese. Other authors obtained between 48% and 68% abandonment^{10,18}. Using a diet adapted to the patient's habits, with locally sourced foods and easy measurement of the amounts of foods used, pursues two objectives: the dietary treatment is better adapted to the patient, and also the fact that this type of method may be applied in different public institutions (health centres, hospitals etc).

Parameters for interpretation of the loss

Two new indicators were proposed in order to evaluate the weight loss: the quality (QL) and the variability (V%WL and V%FL) which will help to make comparisons in any clinical trial carried out with humans at different times during the treatment, irrespective of their sex, age and BMI. Therefore, it will permit recognition of exactly when and in what conditions a treatment is most effective. The variability

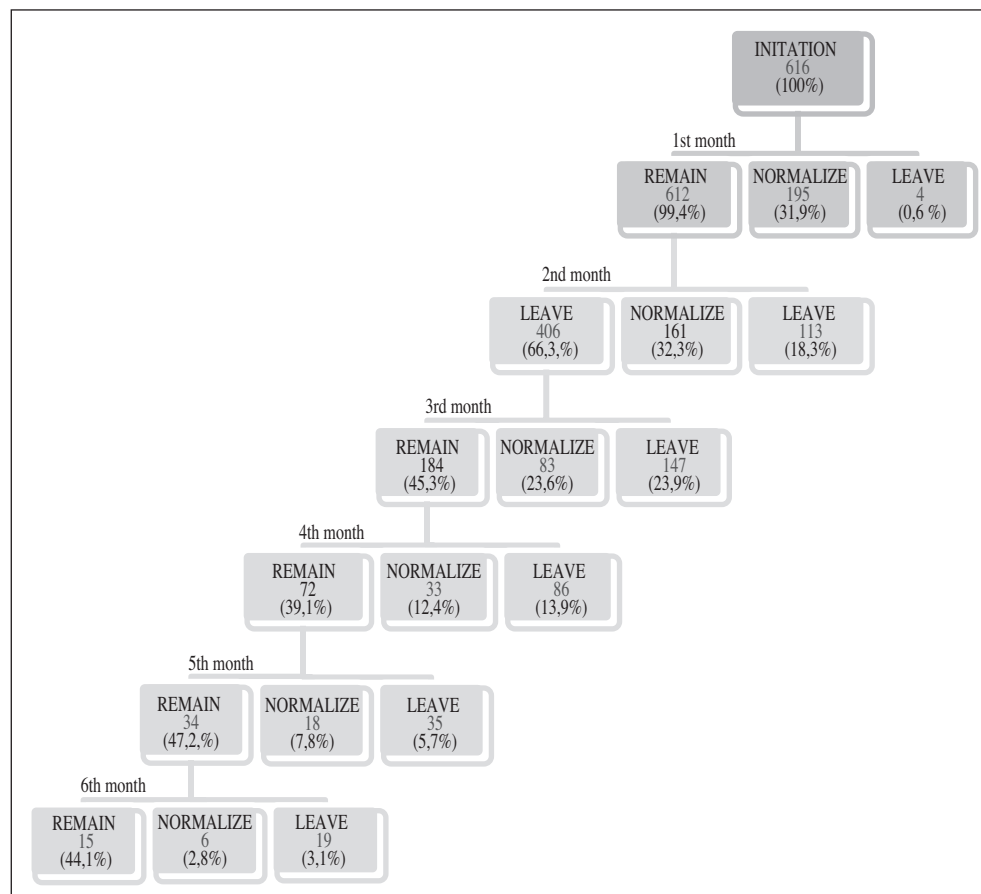


Fig. 1.—Evolution of the total sample during the six months of treatment.

Table II
%WL, %FL, QL, V%WL, V%FL in patients who remain, according to sex, age groups and excess weight or obesity (average and standard deviation)

<i>Treat-ment</i>	<i>Change-ful</i>	<i>Men n=188</i>	<i>Woman n=428</i>	<i>25-44 years n=322</i>	<i>>45 years n=294</i>	<i>Overweight n=275</i>	<i>Obesity n=341</i>
1st month	%WL	4,4(2,3) *	4,0(2,4) *	4,1(2,7)	4,0(2,0)	4,2(2,6)	4,0(2,1)
	%FL	11,1(8,3) ***	7,6(6,0) ***	9,5(7,8) **	7,8(6,0) **	9,9(7,7) ***	7,7(6,2) ***
	QL	3,1(5,4) ***	2,2(2,3) ***	2,9(4,6) *	2,1(2,0) *	2,5(2,9) ***	2,4(4,0) ***
	V%WL	36,5(38,2)	25,6(57,5)	26,4(63,1)	31,5(38,4)	22,6(68,0) *	33,8(35,5) *
	V%FL	43,9(47,1) *	35,8(60,2) *	37,0(52,0)	39,7(61,3)	35,6(56,9) *	40,4(56,5) *
2nd month	%WL	3,1(2,3)	2,8(2,5)	3,1(2,4)	2,8(2,4)	2,9(2,4)	2,9(2,4)
	%FL	9,4(8,3) ***	6,3(6,7) ***	7,4(7,3)	7,3(7,5)	8,2(8,2)	6,9(6,9)
	QL	2,5(5,2) ***	1,7(8,2) ***	1,2(8,0)	2,4(6,9)	1,9(9,8)	2,8(5,5)
	V%WL	70,8(25,6)	71,6(60,0)	69,2(65,4)	73,1(33,9)	69,6(74,8)	72,3(30,2)
	V%FL	65,5(29,8)	62,8(75,8)	55,6(80,7)	70,7(43,5)	51,0(89,9) *	70,9(41,2) *
3rd month	%WL	2,1(1,9)	2,3(1,9)	2,7(1,9) *	1,9(1,9) *	1,7(1,7)	2,4(1,9)
	%FL	7,0(10,1) **	4,5(6,0) **	7,0(6,0) **	4,6(8,9) **	4,8(6,6)	5,7(8,4)
	QL	1,8(13,7)	2,9(5,4)	2,9(7,1)	2,4(11,3)	3,8(5,0)	2,2(10,4)
	V%WL	82,5(17,8)	79,4(18,2)	76,2(16,8)	83,2(18,3)	82,7(16,8)	80,1(18,4)
	V%FL	82,0(27,8)	77,3(30,8)	73,6(27,9)	82,5(30,3)	81,6(29,5) *	78,6(29,8) *
4th month	%WL	1,6(1,4)	1,4(2,2)	1,2(1,8)	1,7(1,8)	1,2(1,3)	1,5(1,8)
	%FL	4,4(5,8)	3,4(6,0)	3,5(6,1)	4,1(5,9)	2,0(7,1)	4,0(5,8)
	QL	1,4(14,5)	2,8(3,1)	2,6(5,1)	1,8(13,3)	4,8(5,3)	1,9(10,7)
	V%WL	87,6(10,9)	98,0(39,5)	90,5(13,7)	94,0(35,0)	88,3(15,4)	93,1(29,9)
	V%FL	85,9(20,5)	89,9(20,0)	91,8(17,3)	85,5(21,7)	89,7(34,3)	87,7(19,1)
5th month	%WL	1,3(1,2)	1,5(2,1)	1,1(1,7)	1,5(1,7)	1,7(0,7)	1,4(1,7)
	%FL	3,4(5,0)	3,9(5,1)	4,0(3,0)	3,5(5,7)	7,9(4,0)	3,2(4,9)
	QL	1,8(10,1)	4,5(7,1)	6,3(10,1)	2,1(8,9)	5,6(4,7)	2,8(9,1)
	V%WL	91,2(13,5)	92,9(13,8)	93,8(8,9)	91,2(15,0)	79,5(3,5)	93,3(13,3)
	V%PG	84,9(23,3)	97,8(40,2)	89,0(9,1)	91,5(38,0)	52,5(1,2) *	95,0(30,6) *
6th month	V%FL	-0,5(1,9) **	2,4(1,8) **	0,1(2,2)	1,2(2,4)	NP	0,9(2,3)
	%FL	2,9(3,8)	4,4(6,4)	2,8(2,8)	3,9(5,8)	NP	3,6(5,0)
	QL	6,4(14,9)	-0,4(6,6)	10,2(18,1)	0,1(7,8)	NP	3,0(11,6)
	V%WL	89,9(26,3)	82,9(7,1)	98,1(14,9)	81,6(19,8)	NP	86,7(19,5)
	V%FL	88,1(16,4)	116,6(79,1)	91,7(7,8)	105,5(66,0)	NP	101,3(54,4)

NP: not appropriate; * p=0,05; ** p<0,05; *** p<0,01.

of fat and weight loss provides a way of observing the relation between the monthly loss, and the total loss and the changes to health, that is, it will be possible to ascertain in which month the best or worst results are obtained with respect to the treatment as a whole. And the QL is recommended as a complement when determining the efficacy of a treatment, which should be based on the quantity and quality of the weight lost. In order to evaluate and distinguish

between subjects of different sexes, ages and levels of excess weight, it is recommended that the term of variability be used, not only for taking into account the monthly loss but also the total weight loss, however, in order to evaluate the loss of a single individual and the solution of possible pathologies caused by excess weight, it is more interesting to use the quality of loss, as the variation in body fat is related to the state of health¹⁻³.

Table III
Evolution of the V%WL and V%FL in the total sample during the six months

Treat-ment	V%TWLS	V%FLTS
1 st month	28,9(52,6)	38,4(56,6)
2 nd month	71,4(50,9)	63,7(63,8)
3 rd month	80,6(18,0)	79,2(29,6)
4 th month	92,7(28,9)	87,8(20,2)
5 th month	92,0(13,3)	90,7(31,8)
6 th month	86,7(19,5)	101,3(54,4)

The effectiveness of the loss between the variables

Men and women showed significant differences in %WL, %FL and QL in the first months, in V%WL and V%FL in the first month only. This indicates that when the monthly variation is observed, it can be seen how men obtain a greater loss in terms of quantity and quality than women, however, when the relation between monthly and total loss is taken into account, the differences are reduced. If this issue is considered and the fact that women lose the same or more weight and fat in the final months of the treatment, it may indicate that despite the findings, women are more constant. A relation is found between the terms %WL, %FL and QL, however this does not occur with the relation between %WL, %FL, V%WL and V%FL. In those under or over 45 years, there are significant differences in %WL, %FL and QL, only in the first month, this indicates that only in that month are differences in the loss based on age obtained. In terms of excess weight and obesity, differences in WL, %FL, V%WL and QL are only found in the first month, despite the fact that in the obese, significant variations were noted in V%FL, up to the end of treatment, this indicates that the dietary treatment is especially effective due to the variability of the fat loss. In all cases a random relation is shown between the variables of %WL, %FL, V%WL y V%FL.

The waist and hip measurement is being introduced as an indicator of body fat, and already some studies have shown interest in differences in weight loss between the sexes and that in men it is more frequent for the weight loss to be associated with body fat than in women¹⁹. Based on these facts it is recommended that there should be further research on the effectiveness of loss according to sex, age and BMI. Current clinical trials focus on the efficacy of the treatment applied, without taking into account the possible differences according to the characteristics of patients, such as gender, age, BMI etc²⁰⁻²². Therefore it is recommended that these variables should be treated as dependent, rather than independent as is currently the case.

Effectiveness of the loss based on treatment time

In the development of the degree of weight loss as opposed to treatment time, the efficacy is notable up to the third month of treatment and the high amount of fat lost through variation of %FL and V%FL. In the case of QL, only a worsening of the results obtained on excessive weight were observed, this indicates that the quality of weight loss in men, women, the obese, minors and those over 45 years, improves as the patient's treatment progresses. Notwithstanding this fact, a gradual reduction of %WL, %FL, V%WL y V%FL was noted, which shows that individualised dietary treatment as a qualitative - quantitative method does not appear to affect the amount of weight loss from the sixth month onwards, however, it is possible to evaluate through the concept of quality of weight loss, that the minority of subjects who continue to lose weight when they reach the sixth month of treatment do so above all in terms of fat loss. This indicates that its multidisciplinary use should be recommended from the sixth month, particularly in morbid obesities which need more than six month's treatment.

The relation between age, gender, BMI and effectiveness and the treatment time is not usually considered as a line of research. In most clinical trials time is presented as a descriptive factor, without determining the effectiveness as a dependent variable^{20,21}.

Consensus in the mode of expression of the loss.

It is recommended that consensus be established in the expression of the effectiveness of the dietary treatment, in this study it is recommended that the following variables be used: percentage of weight and fat loss, variability and quality, particularly from this line of research it is reiterated that homogeneity should be established in expressing the results of a weight loss treatment^{4,23}. This recommendation is based on the need for any weight variation programme to show as clearly as possible in the results offered, whether it is evaluating subjects of a different gender, age, level of BMI and including in the case of sporting subjects.

Limitations of the study

The following points should be mentioned: in this study only individualised use is evaluated, not groups or multidisciplinary use; nutritional education classes are recommended for groups in order to make communal learning more efficient, and the fact that the participants were not obtained from public institutions, this last question is due to a problem existing in Spain, as in our country nutritionists and dieticians are not part of the national health system.

Conclusions

Consensus and communication with the patient helps to maximise monitoring, effectiveness of the treatment and reduces the levels of abandonment.

Two new terms are proposed: quality and variability of loss, as both help to determine the effectiveness of a treatment based on quantity and quality of weight loss, irrespective of age, sex, physical activity carried out, etc. Creation of a consensus is proposed in the expression of weight loss results.

Significant differences in weight loss were noted between dependent variables: sex, age and degree of excess weight. Notwithstanding this fact, further work in this line of research is recommended. An individualised qualitative- quantitative dietary treatment was proposed as a method for contributing to an adequate quality of fat loss.

The variability and quality of the loss, show that the individualised dietary treatment is no longer effective after the sixth month. Unresolved obesities should be addressed in a multidisciplinary manner.

Disclosure Statement

The authors report no conflict of interest.

Acknowledgements

The “Garaulet” obesity research team of the Faculty of Biology at the University of Murcia (Spain). Cristina García Azorín. English philologist. Thank you very much for your support and encouragement.

Compliance with the ethical standards of the Research Committee and the Declaration of Helsinki.

Prior to using the data, informed consent was sought and obtained from each patient; subsequently, the anonymity of all data used was strictly protected.

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