



## ORIGINALES

### Flow diagram for secondary prevention of obesity according to the origin of the problem: C.C.E.P. Bimbela

Diagrama de flujo para prevención secundaria de la obesidad según el origen del problema: P.E.I.C. "Bimbela"

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#### ABSTRACT:

**Objective:** Development of a flowchart that allows the professional Primary Care to carry out the decision with the obese patient, depending on the source of the problem.

**Methods:** Based on the premises of Virginia Henderson, on factors influencing the independence of patients to meet their basic needs: lack of strength (can not), lack of will (do not want) or lack of knowledge (do not know); it has developed a decision diagram depends on "the source of the problem": "Comprehensive Community Educational Project (C.C.E.P.) Bimbela".

**Results:** Cases with criteria consistent inclusion non-pharmacologic dietoterapic program for obese adults in consultation Community Nursing. The program took place between January 2012 and December 2013 (96 weeks).

**Conclusion:** The flowchart can provide carry out the decision in Primary Care, allowing improve adherence to weight loss and maintenance program.

**Keywords:** Obesity; Primary Care; Prevention and Protocols; Food Habits; Feeding Behaviour; Combined Modality Therapy.

#### RESUMEN:

**Objetivo:** Elaboración de un diagrama de flujo que permita al profesional de Atención Primaria llevar a cabo la toma de decisiones con el paciente obeso, en función del origen del problema.

**Material y Métodos:** Partiendo de las premisas de Virginia Henderson sobre los factores que influyen en la independencia de los pacientes para cubrir sus necesidades básicas: falta de fuerza (no puede), falta de voluntad (no quiere) o falta de conocimientos (no sabe); se ha elaborado un diagrama de decisión según "el origen del problema": "Proyecto Educativo Integral Comunitario (P.E.I.C.) Bimbela".

**Resultados:** Se captaron aquellos casos con criterios de inclusión compatibles con un programa dietoterápico no farmacológico para pacientes obesos adultos en la consulta de Enfermería Comunitaria. Se desarrolló entre Enero 2012 y Diciembre 2013 (96 semanas).

**Conclusión:** El diagrama de flujo permite facilitar la toma de decisiones en Atención Primaria, logrando una buena adherencia al programa de adelgazamiento y mantenimiento de peso.

**Palabras clave:** Obesidad; Atención Primaria; Prevención y Protocolos; Hábitos alimenticios; Conducta Alimentaria; Terapia Combinada.

## INTRODUCTION

Obesity is an excess of adipose tissue that causes an increase in body weight according to other people with same sex, height and age, due to among other things, poor eating habits, metabolic alterations, psychological dysfunctions (anxiety and / or depression) or hereditary factors <sup>(1)</sup>. Obesity is considered to be a chronic pathology that requires long-term treatment and constant assessment of prognostic factors and outcomes.

The fundamental guidelines of the treatment of obesity have not changed in the last 20 years, with general advice based on diet, behavioral modifications and exercise, as well as, in some cases, pharmacological and / or surgical treatment <sup>(2,3)</sup>. Currently, the therapeutic proposals presented to the obese patient to achieve changes in lifestyle have a failure rate, from 46% to 81% of patients who start treatment <sup>(4,5)</sup>.

The main causes of failure of the therapeutic program for weight loss and maintenance are <sup>(6)</sup>:

- Absence of disease awareness.
- Lack of understanding of treatment.
- Search for solutions that do not require changes in lifestyle.
- Frustration at the lack of clear and fast results with a tendency to hold the difficulties to the diet or to the professionals responsible <sup>(1)</sup>.

According to Virginia Henderson's model of nursing, <sup>(7)</sup> basic needs are satisfied only by the person, when the person has the knowledge, the strength, and the willingness to cover them. In addition, he considers that the person is a "whole", which presents fourteen fundamental needs of a bio-psycho-social order, thus, if a need is not satisfied by the person himself through appropriate actions, this individual does not achieve independence <sup>(7)</sup>.

The treatment of obesity in Primary Care involves an interdisciplinary or multidisciplinary system and requires the development of clinical pathways, through flow diagrams <sup>(8)</sup>, to know the way and the moment to do it, and / or the treatment to be provided during the professional activity of the Health Centers.

Currently, there is great variability in clinical practice in health centers that address the prevention of obesity <sup>(9,10)</sup>, resulting in differences in the use of health resources, in the results obtained as well as in the provision of services to the patients. Depending on the specialization (primary, secondary or tertiary prevention) of the programs being carried out, different sequenced models are developed <sup>(11)</sup>.

However, in order to standardize clinical practice, specific management tools such as Clinical Practice Guidelines (GPC), Protocols and Clinical Pathways <sup>(12)</sup> are not only necessary, but also to have strategies that allow the identification of subjects with

greater success, because of their degree of motivation and preparation, in order to optimize resources in more intensive multidisciplinary programs <sup>(13)</sup>. That is to say, "Focusing on the patient rather than on the disease, since that is the key to improving health care" (Conference of Health Guide, Madrid, April 4, 2016)

## OBJECTIVE

Elaboration of a flowchart or organizational chart that allows the Primary Care professional to carry out the decision making with the obese patient, depending on the problems observed or expressed by the patient (origin of the problem), to improve adherence to the Slimming and maintenance program.

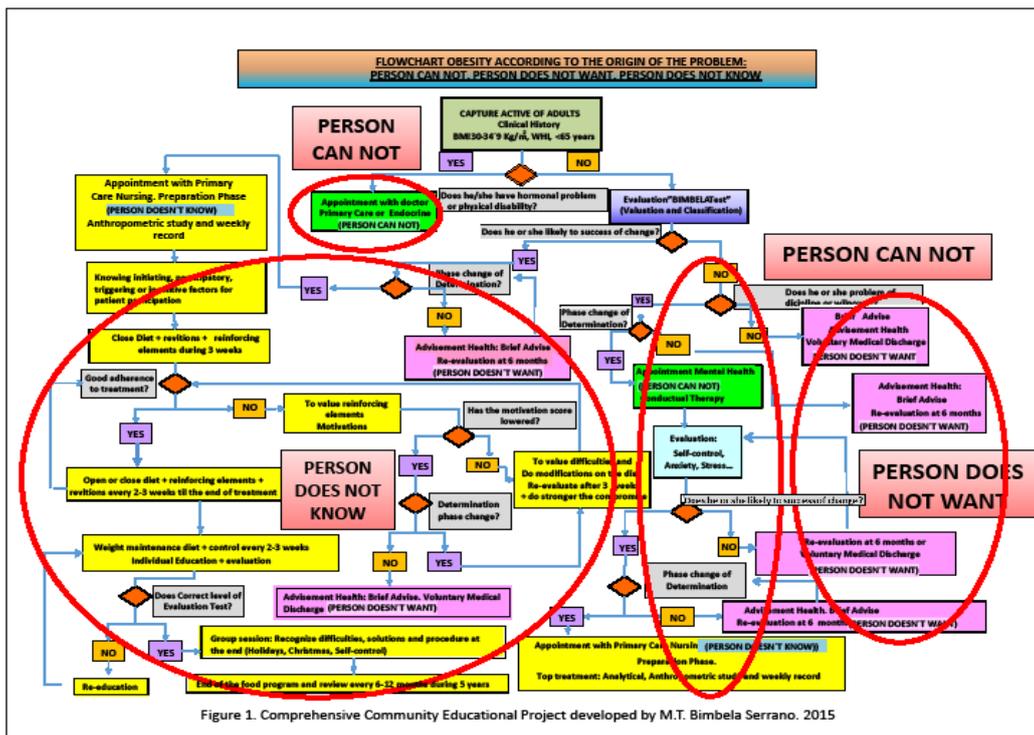
## MATERIAL AND METHODS

Based on the premises of Virginia Henderson's nursing model, a sequence of action (decision diagram) or organigram in the treatment of obesity has been elaborated, being considered as critical decision-making criteria "the origin of the problem".

In addition, to determine the direction of the action with each patient, it has been considered fundamental to evaluate each patient's individual perception of 10 items, related to 7 personality traits (Level of "Self-control", "Constancy", "Sacrifice", "Overcoming"; Influence of "Random", "Surveillance" and "Environment") and with 3 global dimensions of their stage of change ("Motivation", "Difficulty" and "Reward"). These items are included in the questionnaire "Test of prediction of the success of change (Bimbela Test)" (Accepted in the Intellectual Property Registry of the Government of Aragon, Saragossa, 2013), which allows determining the predisposition of the patient to modify his behavior since, in some cases, obesity is related to the need to resort to food as a compensatory element to confront feelings of guilt, manage frustration, etc. <sup>(14)</sup>.

The measurement of the items is carried out by means of a scale for Semantic Differential (Osgoo), which varies from VERY LOW to VERY HIGH. To do this, a score scale of 1 to 10 (1 minimum-10 maximum) is assigned to the items or emotional factors that determine the behavior change. Thus, for example, if a patient presents little motivation, the individual will score with the lowest values of the numerical scale and vice versa.

This project (Figure 1. **C**omprehensive **C**omunity **E**ducational **P**roject (C.C.E.P) developed by M.T. Bimbela Serrano: "C.C.E.P. Bimbela". 2015), was designed for be used by family physicians, endocrines, community nurses and mental health nurses<sup>(15)</sup>.



Its installation and start-up took place in different phases:

**Phase 1.** Development of the flowchart: Forms of action according to the cases.

The organization chart that is presented in this project to carry out in the secondary prevention programs of obesity in primary care is subdivided into three main areas depending on the forms of action according to assumptions:

AREA 1: Referral to family medicine or specialized care when the patient "can not" due to organic or hormonal problems or when the patient needs to receive some more complex medical or surgical treatment. In this case, the family doctor will be in charge of deciding if the organic and / or hormonal disorder of the obese patient requires treatment and follow-up in the primary care medicine consultation or if, instead, it is derived to specialized care so that the endocrine, carries out, in each case, the pharmacological or surgical treatment of these patients (Figure 2. C.C.E.P. Bimbela "CAN NOT": Areas 1 and 2).

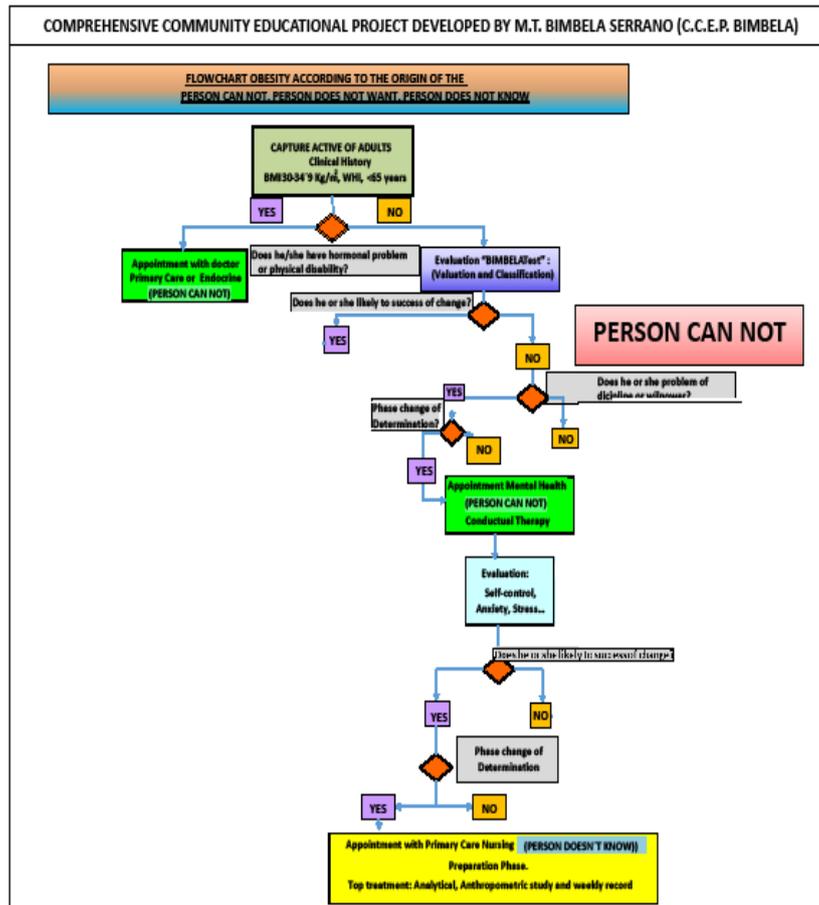


Figure 2. C.C.E.P. Bimbela "PERSON CAN NOT": Areas 1 and 2

AREA 2: Referral to the mental health clinic when the patient "can not" due to anxious / compulsive eating problems. In this case, the mental health nurse will be the professional in charge of receiving the patient with a low probability of success due to behavioral difficulties and, with the rest of the professionals of the mental health unit, to plan the necessary measures to improve patient aspects related to: "Self-control", "Constancy", "Sacrifice Ability", "Ability to Overcome", "Influence of Environment", "Influence of Randomness" and "Influence of Surveillance" (Figure 3. C.C.E.P. Bimbela "DOES NOT WANT": Situation "A").

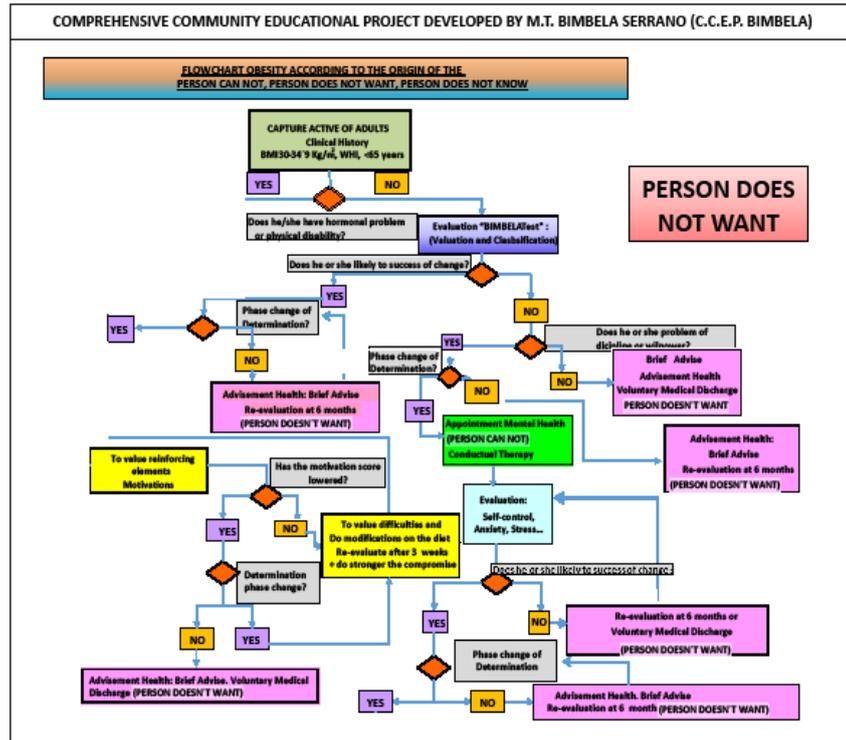


Figure 3. C.C.E.P. Bimbela "DOES NOT WANT": Situation "A"

AREA 3: Referral to the community nursing consultation when the patient "does not know".

In this case, the community nurse will be the professional in charge of teaching the obese patient the keys to carry out the program of modification of hygienic-dietary habits for weight loss and maintenance (Figure 4. C.C.E.P. Bimbela "DOES NOT KNOW": Area 3 + Situation "B" and Situation "C").

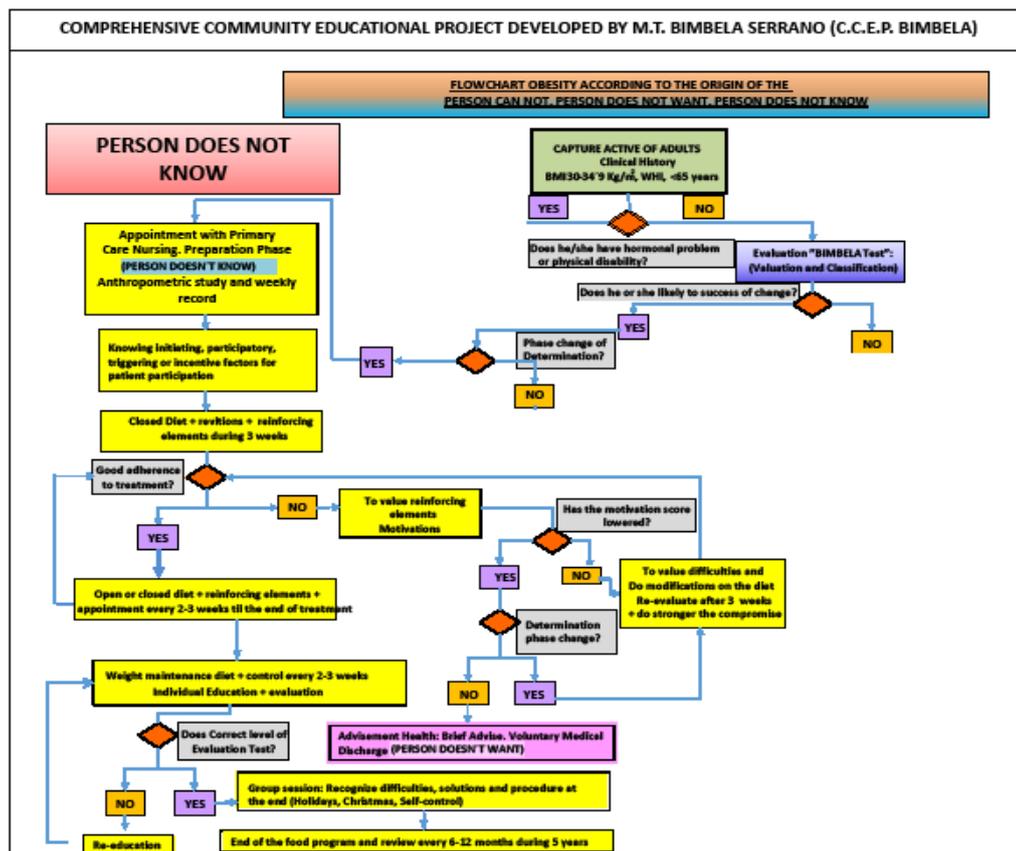


Figure 4. C.C.E.P. Bimbela "DOES NOT KNOW": Area 3 + Situation "B" and Situation "C"

In addition, throughout the organization chart, three "special situations" are proposed that must be considered by the health professional:

SITUATION "A": "Sanitary Council / High Volunteer".

This situation will occur in those cases where the patient "does not want" to lose weight; or "does not want" to continue with the slimming / maintenance program after a reasonable educational period. The possibility of reassessing the patient will be allowed periodically, in case, at another time, he / she will be in favorable conditions to initiate or retake the treatment again, through aspects related to "Motivation", "Difficulty" and "Reward" self-perceived by the patient.

SITUATION "B": "Self-control of weight".

This situation will occur in those patients who have successfully completed the education program in the community nursing consultation for weight loss and maintenance, proposing scheduled reviews every 6-12 months to evaluate the weighing done by the patient at home, during following five years of finishing the maintenance program.

SITUATION "C": "End of the food program"

This situation will occur after being with a good weight self-management during five years, since it is considered that the patient already has control capacity and weight regulation and therefore, the risk of recovery of lost weight is minimal.

At this point, it can be said that the patient has achieved the independence proposed by Virginia Henderson: "The patient CAN, KNOWS and WANTS" and therefore, does not require the assistance of the health professional.

It will be recommended to the patient, to be mentioned annually in the consultation of medicine to control the state of health through results of urine and blood analysis; and at the same time in the nursing consultation for constant control (blood pressure, heart rate) and measure the weigh every month by the patient, in his own home, for recording in his medical record.

### **Phase 2. Identification and capture of cases for the community nursing consultation**

To verify the outcome of the classification of patients included in "Area 3" (# Referral to the community nursing consultation when the patient "does not know" #), an analytical, longitudinal, prospective, experimental, included in the program to support the initiatives to improve the quality of health in the Alcañiz sector, which annually organizes the Aragonese Health Service under the title "Programming the Primary Care consultation for the education of the chronic patient: Treatment of obesity. " For the selection of patients, criteria were established to be compatible with a non-pharmacological dietary program based on diet, physical activity and education for adult obese patients <sup>(16)</sup>.

Those patients with a low score in "Bimbela Test" were considered necessary to be previously addressed in the Mental Health Unit, with a behavioral treatment, but the results obtained with such therapy were not evaluated.

### **Phase 3. Planning of cases in the community nursing consultation (16)**

A.- Recruitment of patients with inclusion criteria (17):

B.- Realization of:

- Survey of eating habits, consumption record and weekly physical activity. (18)
- Calculation of total energy requirements: Basal Energy Expenditure (Harris-Benedict equation) + Physical Activity + Thermal Resonse of Specific Foods.
- Development of a personalized hypocaloric diet, according to the patient's habits and tastes, through one of the two most frequent educational therapies used in Primary Care: closed diet or planned diet and open diet or diet through exchanges.

C.- Controls every 2-3 weeks where they were studied:

- Anthropometric data: Weight, waist-hip index and arm circumference, folds (Tricipital, Bicipital, Ilium,Subscapular) and Bioelectric Impedance.
- Approach of difficulties: Evaluation and resolution of dietary problems

D.- At the end of the treatment of weight loss, individual education sessions (15-30 minutes) <sup>(19)</sup>

## **RESULTS OF TYPE CASES**

After assessing the situation where the individuals with obesity are found, the performance algorithm for the prevention of obesity of "Area 3" was started from

January 2012 to December 2013 (96 weeks) with 50 people from the consultation Nursing of a Rural Health Center in the province of Teruel (Spain). The sample represents the equivalent of 36.23% of the population that met the inclusion criteria (138 people) of a total population of 4245 patients: 645 people <18 years old, 1121 people aged 18-65 years and 1834 people > 65 years . The remaining 63.77% (88 people) of the people who met the inclusion criteria were found at the beginning of the study in SITUATION "A": "Sanitary Council" and "not wanting" to lose weight.

The total sample was composed of 50 people (26 men and 24 women) with a mean age of 55 years ( $\pm 8.3$  SD). The group consisted of 47 married people (94%) and 3 single women (6%). The sample is dedicated to activities in the household (15 people = 30%), agriculture (15 people = 30%), commerce (12 people = 24%), masonry (3 people = 6%), = 4%), livestock (2 people = 4%), plumbing (1 person = 2%).

The mean physical activity is estimated at 2h / week ( $\pm 0.9$ DS). They had a mean BMI of 33.6 kg / m<sup>2</sup> ( $\pm 3.3$  SD), systolic blood pressure of 131 mmHg ( $\pm 12.8$  SD), diastolic blood pressure of 77 mmHg ( $\pm 10.9$  SD), and Framingham Test with an average score of 10 ( $\pm$  SD 6.7).

When evaluating the previous experience of some kind of slimming diet with or without professional control, 15 of them (30%) answered that they had taken some previous diet to lose weight and the remaining 35 (70%) said they had not done any type diet.

In addition, 7 smokers (14%), 34 non-smokers (68%) and 9 ex-smokers (18%) were asked about smoking.

After 48 weeks of treatment, the rate resulting from the follow-up of the slimming program was 80% of the initial participants, with a mean total weight loss of the participants according to the initial weight was -7.7 kg (-8.5% of initial weight). At the end of the 96-week planned program, the follow-up of the final maintenance program was 76% of the initial patients, who had an increase in weight of +1.42 kg (+ 1.2% of the weight lost).

The final sample of participants was composed by 38 people (20 men = 53% and 18 women = 47%) and they were 55 years old ( $\pm 7.7$  SD). The group consisted of 37 married people (97%) and 1 single (3%). The sample is dedicated to activities in the household (9 people = 24%), agriculture (11 people = 29%), commerce (11 people = 29%), masonry = 5%), livestock (2 people = 5%), plumbing (1 person = 3%).

The average physical activity is estimated at 4 h / week ( $\pm 1.5$  DS). They present a mean BMI of 31.3 kg / m<sup>2</sup> ( $\pm 3.3$  SD), systolic blood pressure of 130 mmHg ( $\pm 10.6$  SD), diastolic blood pressure of 76 mmHg ( $\pm 10.5$  SD), and Framingham Test with an average score of 10 ( $\pm$  SD 6.0).

When evaluating the previous experience of some kind of weight loss diet with or without professional control, 11 (29%) initially answered having taken some previous diet to lose weight and the remaining 27 (71%) said they had not done any diet beforehand.

In addition, in relation to other life-threatening health habits such as smoking, 4 of the people (10%) who finished were habitual smokers, 25 (66%) non-smokers and 9 (24%) ex-smokers.

In relation to the "Bimbela Test" the scores before the beginning ("Moment 1"), after the program of slimming ("Moment 2") and maintenance ("Moment 3"), these can be observed in Table I: Scores of the "Bimbela Test" before the start ("Moment 1"), after the program of slimming ("Moment 2") and maintenance ("Moment 3")

	MOMENT 1						MOMENT 2						MOMENT 3					
	TOTAL GROUP		MEN		WOMEN		TOTAL GROUP		MEN		WOMEN		TOTAL GROUP		MEN		WOMEN	
	AVG	SD	AVG	SD	AVG	SD	AVG	SD	AVG	SD	AVG	SD	AVG	SD	AVG	SD	AVG	SD
MOTIVATION	6.9	± 2.5	6.5	± 2.7	7.3	± 2.2	8.5	± 1.4	8.3	± 1.6	8.8	± 1.1	8.5	± 1.1	8.5	± 1.1	8.5	± 1.1
DIFFICULTY	7.3	± 1.8	6.8	± 1.7	7.7	± 1.8	4.5	± 2.7	4.1	± 2.8	5.7	± 2.3	4.4	± 2.3	3.7	± 2.3	5.3	± 2.0
REWARD	7.5	± 3.0	6.8	± 3.7	8.4	± 1.7	8.8	± 1.8	8.8	± 1.8	8.8	± 1.8	8.3	± 1.7	8.3	± 1.5	8.8	± 1.9
SELF-CONTROL	6.2	± 2.2	6.9	± 1.6	5.3	± 2.5	7.5	± 1.6	7.8	± 1.4	7.2	± 1.7	7.6	± 1.6	7.9	± 1.4	7.2	± 1.8
CONSTANCY	6.6	± 1.9	6.6	± 1.4	6.6	± 2.4	7.5	± 1.4	7.4	± 1.3	7.5	± 1.6	7.5	± 1.4	7.5	± 1.2	7.5	± 1.6
SACRIFICE	7.0	± 1.8	7.7	± 0.9	6.2	± 2.2	7.8	± 1.7	8.3	± 1.0	7.3	± 2.1	8.0	± 1.4	8.3	± 1.0	7.6	± 1.7
OVERCOMING	7.0	± 1.9	7.6	± 1.4	6.4	± 2.2	8.1	± 1.5	8.2	± 1.3	7.9	± 1.7	8.2	± 1.4	8.3	± 1.2	8.0	± 1.7
RANDOM	4.9	± 2.3	5.0	± 2.6	4.8	± 2.1	4.5	± 2.3	4.3	± 2.4	4.7	± 2.3	4.4	± 2.3	4.1	± 2.3	4.7	± 2.4
VIGILANCIA	5.9	± 2.7	5.1	± 2.7	6.8	± 2.5	5.9	± 3.0	6.1	± 3.2	5.7	± 2.8	6.0	± 3.0	6.2	± 3.3	5.8	± 2.8
ENTORNO	4.3	± 3.1	3.9	± 3.1	4.8	± 3.2	4.4	± 2.9	3.8	± 2.5	5.0	± 3.2	4.4	± 2.6	3.9	± 2.5	4.9	± 3.2

Table I. Scores of the "Bimbela Test" before the start ("Moment 1"), after the programme of slimming ("Moment 2") and the programme of maintenance ("Moment 3")

## DISCUSSION

In order to achieve the success of the treatment of obesity, every patient, it is crucial to evaluate the origin of the problem in order to be able to choose the health professional responsible for the implementation of this chronic health problem, considered the epidemic of the 21st century <sup>(19)</sup>.

Thus, the fact that the human being expresses his commitment of change or motivation, increases the probability of success, although this does not make it the only condition. Therefore, to verify the existence of favorable indicators of behavior change in the patient, can help to adapt resources adequately and to carry out therapeutic strategies in the shortest possible time <sup>(20)</sup>.

For this reason, it is considered key to derive Mental Health Unit to those patients who lack or have very low levels in the 7 items, mentioned above, related to the personality traits of the individual to be treated, so that they can be educated by specialized professionals.

Once these stages are completed, realistic therapeutic goals should be posed, which should be periodically reassessed along with the patient's emotional state; without forgetting that during the treatment it is advisable to use pedagogical resources such as: Awards, congratulations, models, selection of information and change of beliefs <sup>(21)</sup>, change of feelings, reasoning, training and elimination of difficulties <sup>(22)</sup>.

Thus, with the algorithm used in this study, the results obtained with obese patients whose origin of the problem is due to lack of knowledge ("Do not know"), both the

slimming program and the maintenance program are very positive. It is important to note that the final results of adherence to the weight loss program exceed those obtained so far in other studies (4.5), which had adhesions, from 19% to 54% of patients who started treatment.

In addition, the values detected in 76% of this population, one year after the end of the weight loss program, is within the recommended weight maintenance standards of the patients, achieving a weight oscillation close to  $\pm 1\text{Kg}$  weight / year. This result differs from other investigations that show a weight maintenance of 10% of the cases, at the end of the weight loss program, with the remaining 90%, recovery and even overweight, prior to diet therapy <sup>(23)</sup>.

Therefore, it is considered fundamental that the professional or team involved in the treatment of these patients maintain a critical attitude towards the real demand or the excess attention in obesity, in order to be able to adequately define the indications, objectives and limitations of the treatment, which is an extra effort for the professional that should be recognized <sup>(15, 24)</sup> through a restructuring of the professional's agenda to improve the level of contribution to health promotion and prevention.

## CONCLUSION

The flow diagram or decision tree enables the Primary Care professional to make decisions with the obese patient and to improve the adherence to the weight loss and maintenance program compared to the results obtained in the current literature.

Limitations: It is possible that the success of patients' responses to the proposed treatment may be influenced by their knowledge of their inclusion in an obesity study program ("Hawthorne Effect").

However, it would be interesting to apply this flowchart based on the origin of the problem in other basic health areas to verify the improvement of the adherence to the slimming and maintenance program, compared to the results obtained up to the Moment in the current bibliography.

## Acknowledgments

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