

TIVA

Program to promote Positive
Mental Health through the
'*Cuidadoras Crónicos*' App



UNIVERSITAT ROVIRA I VIRGILI



UNIVERSITAT DE
BARCELONA



Fondo Europeo
de Desarrollo Regional
"Una manera de hacer Europa"

TIVA

Program to promote Positive Mental Health through the "Cuidadoras Crónicas" App

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Introduction

Introduction

Technological and scientific advancement on health and disease in recent centuries in developed countries has led to an ageing society and facilitated the chronicity of certain pathologies which, together with unhealthy lifestyle habits, lead to an unstoppable increase in the number of dependents requiring long-term care and assistance needs from formal and informal systems (1, 2).

There is consensus, that people who assume the role of family caregivers of chronically ill people take on a large number of tasks that place them in a situation of high vulnerability, stress and uncertainty, increasing the risk of suffering from various physical and emotional problems that cause an impact on the life of the caregiver (3-6). For this reason, mental health, from a positive perspective, becomes a fundamental tool to promote the maintenance and optimal development of the caregiver's mental health, as well as the need to be able to offer continuous care in this area.

Mobile applications and online health interventions are a useful tool to complement face-to-face therapeutic measures (7,8) as well as to be able to provide continuous care.

For this reason, it has been created a Program to Promote Positive Mental Health (SMP) called **TIVA- Program to Promote Positive Mental Health through the App "Cuidadoras crónicas" (Chronic Caregivers)** that we developed in this manual. The intervention program that is presented is implemented through a mobile application and aims to promote the Positive Mental Health of caregivers of a chronic patient, empower caregivers and be able to obtain an improvement in the state of biopsychosocial health, through online interventions of positive mental health provided by TIVA, the character of the application that has a plant shape, specifically an onion form, who develops through the realization of the 20 activities that make up the intervention program, developed over 4 weeks.

In addition, the program aims to help empower caregivers of people with chronic problems, through activities aimed at reducing the physical and psychological consequences of continued care for a dependent and maintaining and increasing the level of overall well-being (physical and mental).

There are multiple face-to-face intervention programs to care for caregivers but there are few applications that can facilitate the fact that caregivers do not have to move or travel and It was used in a shared way with healthcare professionals (9, 10).

One of the most important aspects of the program is that it is directed, designed and evaluated jointly with nursing professionals who support the caregivers in the field of Primary Care.

Conceptual bases of the TIVA program

Conceptual bases of the TIVA program

Approach related to the work of caregivers

Demographic, social and family changes pose a challenge in the availability of the family in the face of care for dependence, this transformation process has been called "**crisis of informal care or informal support**", highlighting the importance of protecting family care for dependents, as one of the challenges of the welfare society and redefining a new model of care.

The conceptual base on which "*care for the caregiver*" is framed is based on previous studies carried out by the research team and the review of literature review (11-14), where the is defined the professional approach, on which they should be based and the interventions aimed at this group.

The caregiver is a healthy person in a transition process, is not a patient. For this reason, the sense of care should be oriented in identifying their needs for help and accompaniment from a joint and autonomous work perspective, between the caregiver and healthcare professionals.

The caregiver is a key element in the care of chronic and/or dependent people due to have a triple function: as an informant to professionals of their evolution at all levels of care, as a provider of care in the home environment and as a point of union and communication between healthcare professionals and the caregiver.

Throughout the dependency process the caregiver will have to deal with important and/or difficult decision-making from the beginning of the dependency process until the death of the person cared for in the organization of the life of the patient and his/her family. Complex decision-making can go as far as to consider an ethical and moral judgment on decisions related to a "*dignified death*".

Care is framed in a family environment, where interacting in this environment facilitates mobilizing the personal and/or material resources of the caregiver, reinforcing the feeling of feeling accompanied and reducing overload.

The family caregiver, during the interpersonal process with the person cared for, provides affection and helps in conditions of illness, limitation or disability, sharing their suffering and cooperating in her effort for survival. This undoubtedly the most positive aspect of caregiving, but it involves an emotional effort derived from the strong bond between the caregiver and the person cared for, being able to develop compassion fatigue. Therefore, it is necessary to promote the caregiver's SMP throughout the process.

We agree with other studies in which the caring population is currently mostly female. For this reason, in this text we use the term **caregiver**, to refer to the person who provides care, regardless of whether they are women or a men.

This program is aimed at the different types of caregivers, **primary and secondary family caregivers** who assume different degrees of responsibility in family care and in their organization, as well as non-professional **formal caregivers**, who are the ones who provide their services in the care of dependents, receiving an economic remuneration for the services provided and, in many cases, without specific training. In Spain, family caregivers assume 88% of the time spent on health care for people with chronic processes and/or disabilities.

Work-related approach on Positive Mental Health

The conceptual and metric basis of the positive perspective of mental health used for the development of the program has been the work developed by Lluçh (15-18) with the three elements elaborated by the author:

a) Multifactorial Model of Positive Mental Health that explains mental health from a positive perspective as a construct defined by 6 factors: factor **F1-Personal Satisfaction**, refers to self-satisfaction (self-concept/self-esteem), with the personal life one has and with the prospects for the future; factor **F2-Prosocial Attitude**, includes the sensitivity of the person towards his social envi-

ronment, attitude and desire to help-support others and acceptance of others and differential social facts; factor **F3-Self-control**, contemplates the person's ability to cope with stress and conflict situations, emotional balance, and tolerance to frustration, anxiety and stress; factor **F4-Autonomy**, includes the person's ability to make their own decisions by applying their own criteria, self-regulating their own behavior and maintaining a good level of personal safety; factor **F5-Problem Solving and Self-Update**, refers to the person's ability to make decisions and solve the problems that life entails, as well as the ability to adapt to changes, developing a flexible attitude and continuous personal growth; and factor **F6-Interpersonal Relationship Skills**, includes the person's ability to communicate and establish harmonious interpersonal relationships with the environment and the ability to communicate feelings and give and receive affection.

Under this perspective, Positive Mental Health is defined globally as "a dynamic and fluctuating state in which the person tries to feel and be as best as possible within the circles in which he or she is found". And specifically it is defined as "a state in which the person is able to maintain a certain level of personal satisfaction with himself or herself and with his or her life, a certain capacity to accept others and differential facts, a certain degree of emotional self-control and autonomy, is able to solve the problems presented to it by maintaining an attitude of growth and self-update and is able to establish and maintain satisfactory interpersonal relationships" (Lluch, 1999, 2008) (15,16).

b) The Positive Mental Health Questionnaire (CSMP). To evaluate the Multifactorial Model of Positive Mental Health, Lluch (1999) (15) made a Questionnaire configured by 39 items distributed among the 6 factors of the MMSMP model. Factors interrelation and influence each other by generating the possibility of obtaining an overall level of Positive Mental Health (from the sum obtained in the six factors) and SMP levels for each factor of the model. This feature allows to know in more detail the factors and to decide whether you want to intervene in any or all of the specific factors. The CSMP has been validated in various populations presenting good psychometric properties (19- 27) and has been translated and published in Portuguese (28,29) and Turkish (30). The items that make up the CSMP are formulated by affirmations (positive and

negative) and the response to each item is valued on a Likert-type scale of 1 to 4 points, according to the degree of frequency: always or almost always (4), quite frequent (3), sometimes (2), never or almost never (1) For correction, negative items must be reversed. The distribution of items among the factors, as well as the maximum and minimum values for each factor and for the overall questionnaire are shown in Annex I.

The Positive Mental Health Questionnaire is used within the TIVA Program at four times:

Before starting the TIVA program with a dual objective: to evaluate the initial levels of Positive Mental Health (global and factors), and to help the caregiver to know, through the items, the operative conception of positive mental health.

At the end of the TIVA program, the month after it has been completed and at three months with the aim of knowing the evolution of the positive mental health level (global and by factors) of the caregiver after having carried out the TIVA program, and the effect of the program in the short and medium term (immediate effect and continuity).

c) The Decalogue of Positive Mental Health. It is a set of 10 recommendations that serve to operate the 6 factors of the Multifactorial Model of Positive Mental Health, providing suggestions or recommendations to take care of the positive mental health of ones and of others (17). For the TIVA program, the Design of the Decalogue has been adapted, incorporating the character at the graphic level.

The decalogue is the conceptual element of the TIVA Program from which Positive Mental Health activities have been generated for caregivers of people with chronic health problems.

Decalogue of Positive Mental Health*

This Decalogue is the product of what I call “psychology of the daily life”. It is the result of a scientific study expressed in specific, applicable terms¹. Each recommendation is valuable in itself and can be applied individually or together with the others.

There is no risk if you apply them all!

**In fact the more recommendations we apply to our lives,
the stronger our Positive Mental Health will be.**

Recommendation

Recommendation n°1: Value positively the good things that you have in your life.

Recommendation n°2: Carry out your daily activities with love and affection.

Happiness is among us, hidden in our everyday lives. Don't see each daily activity (taking the tube, going shopping, working...) as a punishment, or something that is indifferent to you. You need to find the positive aspects in these activities and respond to them enthusiastically.

Recommendation n°3: Don't be too hard on yourself or on others.

Tolerance, understanding and flexibility are all good for mental health.

Recommendation n°4: Don't let your negative emotions get in your way.

You can get angry, but don't go too far.

Recommendation n°5: Be aware of the good times in your life while they're happening.

If you have memories of good times in our life, they must have been good times when we experience them. So, we have to enjoy the present, remember the good things from the past, and hope for good things from the future.

Recommendation n°6: Don't be afraid of crying and showing your feelings.

We need to see many feelings as normal: it is normal to feel sad if we have suffered a disappointment; if we have lost a loved one, it is natural (and mentally healthy) to grieve... However, if these emotional states are too intense, persistent or incapacitating, we should ask for help.

Recommendation n°7: Look for places and activities that help you relax mentally. Everyone has their own tastes, options and strategies (walking, reading, gardening, doing nothing, talking to friends).

Recommendation n°8: Try to solve problems when they arise.

If they mount up, our mental health will feel it! Not all problems have good solutions but we have to try and do something to lighten the load. We need an active predisposition towards the solution.

Recommendation n°9: Always take care of our interpersonal relations. Let's talk to our loved ones, visit our friends, get together with our colleagues, neighbours, etc.

Recommendation n°10: DON'T FORGET TO ADD HUMOUR TO YOUR LIFE TO MAKE IT MORE COLOURFUL.



*Author decalogue:
Dra. M^a Teresa Lluch Canut (2011)
Illustration: Raúl Martínez Ruíz (2018)



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Objective of the TIVA Program

Objective of the TIVA Program

The overall objective of the TIVA Program is to **promote the Positive Mental Health of caregivers** of a person with a chronic disease and to reduce the overhead of caring, through the use of an APP.

TIVA Program structure

TIVA Program structure

In the creation of the App, to promote its use and / or loyalty to users, **the gamification** characteristic of games is applied, through functionalities to awaken and maintain the interest of the caregiver through entertainment and get her to carry out all the activities aimed at promoting her well-being.

The structure of the program is based on a specific gamification system, using the following elements: a) a TIVA character, b) a personalized greeting, c) motivating quotes, d) attention to emotional state and satisfaction and e) a scoring system.

Creation and transformation of TIVA, the main character

A representative character is created from the SMP and the Positive Mental Health Program. TIVA, the character of the App, has a plant shape, specifically it is an onion for different reasons: it was wanted it to be a vegetable in order to show growth and evolution. In addition, onion is a staple food that due to the properties and benefits that bring us, can be found in all kitchens; and the most characteristic and representative fact of onion in relation to SMP is that it can make you cry when you cut it but instead, it has the condition of staple food, simple and that combines well with multiplicity of food. For all these reasons, this vegetable was chosen, for its special symbolic burden to identify the concept of Positive Mental Health.

The color of TIVA is violet, as a symbol of gender equality and an attempt has been made for TIVA to convey joy and empathy.

TIVA is presented at the beginning of the program and evolves with the development of established activities over the 4 weeks of the Positive Mental Health Program:

In the first week, TIVA begins its evolution as a small plant to care for and ends the week giving love and already grown.

In the second week, TIVA begins to take on personality and acquires a slightly feminine appearance, where flowers sprout as a sign of joy and growth, and small wings begin to grow. Tiva ends the week resting and ready to start a new change.

In the third week, TIVA sheds her vegetable mane to take on a slightly masculine appearance, as it is in nature to take into account both genera independently. TIVA begins to fly and a heart grows in his chest, as a symbol of affection and empathy that will develop in the last week. End the week with a new partner to look after with the new heart.

In the fourth week, TIVA works all week taking care of the new partner and will end the week a little more evolved and giving off joy and well-being.

TIVA's transformation process is visual. At the beginning of the App, it is recommended that the caregiver evolve the character as a symbol increase of the SMP. When a caregiver performs an activity, TIVA evolves and transforms visually; in the case of not performing the activity the character does not evolve. The following illustration shows the visual evolution of the TIVA character throughout the 4 weeks of the Positive Mental Health Program.

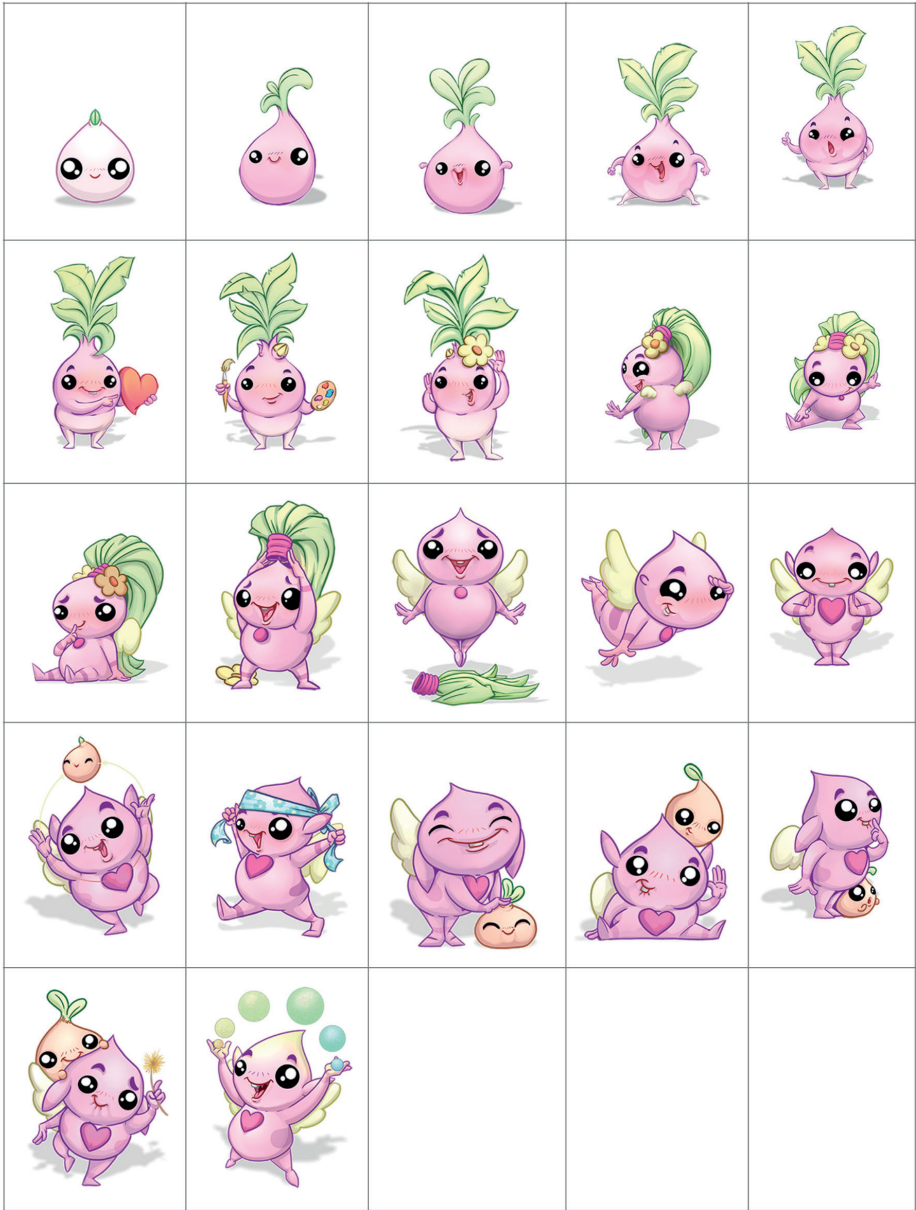
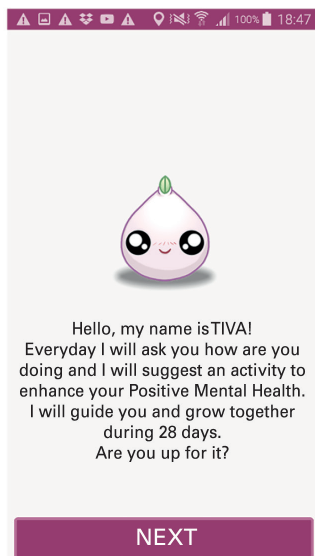


Illustration 1. Evolving TIVA character

Personalized greeting through TIVA

The caregiver receives a personalized greeting of "*good morning...*" at the time agreed from the beginning of the Program to the end; and this greeting is nominal and daily, to reinforce the "contact" with the application and to increase the feeling of "feeling " accompanied.

Illustration 2: Personalized Greeting



TIVA Motivates: motivating quotes

After the personalized greeting, a phrase that the research team selected according to daily activities appeared on the screen. These phrases or quotes (see table 1), by different authors, aimed to stimulate in the caregiver a thoughtful and positive thought about the experience she was living.

Although the activities were scheduled from Monday to Friday, the greeting and the motivating phrase also appeared on Saturday and Sunday to reinforce the feeling of accompaniment, during the weekend.

1. <i>You can have little and be rich.</i> Boris Kovalik.
2. <i>Let your smile change the world. But don't let the world change your smile.</i> Michele Stiles.
3. <i>Don't look for the perfect time, just look for the moment and make it perfect.</i> Anonymous.
4. <i>What you do today can improve all your mornings.</i> Ralph Marston.
5. <i>If you don't have time for the little things, you won't have it for the big ones.</i> Richard Branson.
6. <i>The art of being happy lies in the power to extract happiness from common things.</i> Henry Ward Beecher.
7. <i>As long as the storm is, the sun always shines again in the clouds.</i> Khalil Gibran.
8. <i>There are always flowers for those who want to see them.</i> Henri Matisse.
9. <i>You can't stop the sadness bird from flying over your head, but you can prevent it from nesting in your hair.</i> Proverbio chino.
10. <i>To understand everything is to forgive everything.</i> Lev Tólstoi.
11. <i>Take care of your body. It's the only place you'll really live forever.</i> Anonymous.
12. <i>Some people make your laughter a little louder, your smile a little brighter and your life a little better.</i> Anonymous.
13. <i>A wise doctor said, "The best medicine is love and care." Someone asked him, "What if it doesn't work? He smiled and replied: Increase the dose.</i> Paulo Coelho.
14. <i>Life is an opportunity Take advantage of it!</i> Teresa de Calcuta.
15. <i>Sometimes, getting out of the routine a little bit is just what you need.</i> Anonymous.
16. <i>After great moments, unforgettable memories remain.</i> Anonymous.

17. <i>Fear is natural in the prudent, and to know how to overcome is to be courageous.</i> Alonso de Ercilla.
18. <i>Live life to the fullest and focus on the positive.</i> Matt Cameron.
19. <i>Being happy is a decision that must be made everyday.</i> Frida Kahlo.
20. <i>Feelings are the way the soul is expressed.</i> Marta Ayala.
21. <i>The art of living is not about eliminating problems, but about growing up with them.</i> Stamateas.
22. <i>Present t is the only time we have any dominion, live it and enjoyit.</i> Anonymous.
23. <i>You may be only a person to the world, but for someone, you are the world.</i> Gabriel García Márquez.
24. <i>Bravery does not always roar. Sometimes it's the little voice that at the end of the day tells you, "I'll try again tomorrow."</i> Mary Anne Radmacher.
25. <i>We cannot choose our emotions, but we can do with them.</i> Fátima Servián Franco.
26. <i>Friendship doubles our joys and divides our problems.</i> Anonymous.
27. <i>To achieve this, it is necessary to create; to create you need to believe; and to believe you need to trust.</i> Alex Rovira.
28. <i>Do not forget to paint life with humor so that it has more color.</i> Teresa Lluch.

Table 1: Relationship of the motivating phrases of the TIVA program.

TIVA cares about emotional state and satisfaction

TIVA cares about the emotional state, pre and post daily intervention, and the satisfaction of the caregiver after each activity.

After the daily greeting and the motivating quote, a question is asked regarding the emotional state of the caregiver: *"How are you feeling today?"* to value the emotional state at the beginning of each activity; an activity is proposed below to improve positive mental health; and an evaluation of utility is also made at the end of each activity *"Have you found the activity useful?"*. The caregiver can adjust the schedule of these notifications in a personalized way.

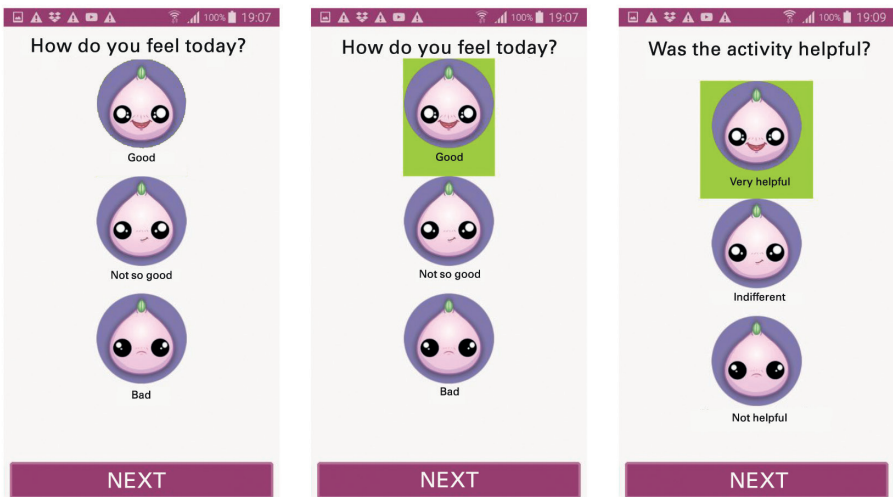


Illustration 3: From left to right: Home screen (How does the caregiver feel?), end screen (was it helpful?)

A scoring system

A point acquisition system was also developed that increases as the caregiver carries out her daily activities. The total score for the program is 700 points.

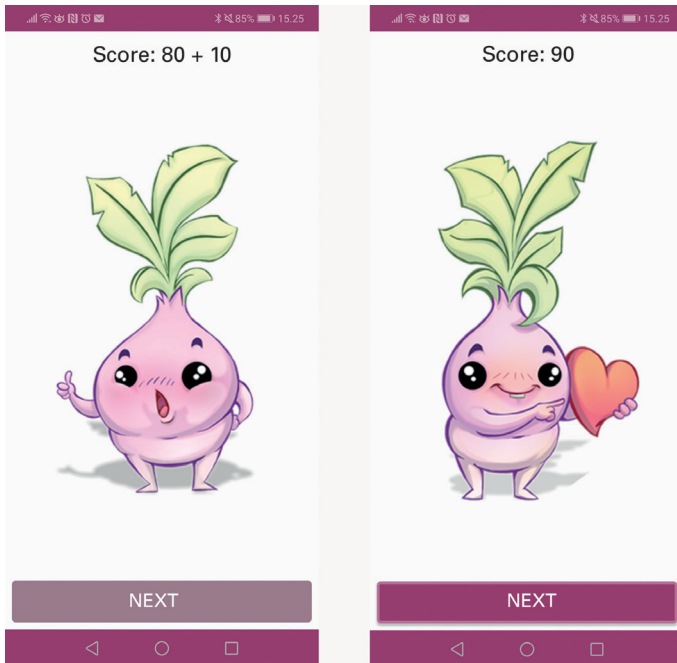
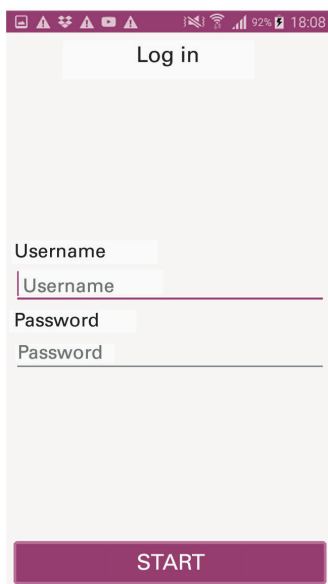


Illustration 4. Example of Score

Program description

Program description

The program is developed through a computer application (App), built specifically for this intervention program, that caregivers have to download and install on their mobile phones. The App can be downloaded at the following link: <http://www.cuidadorascronicos.com/web/infoApp.php>. Each caregiver will need to enter a user code and password, previously provided by their referring nurse. Once installed, the character TIVA is presented who will accompany the caregiver throughout the days and evolve with her actions.



The image shows a mobile application interface for logging in. At the top, there is a status bar with various icons and the time 18:08. Below the status bar, the text 'Log in' is centered. There are two input fields: one for 'Username' with a placeholder text 'Username' and one for 'Password' with a placeholder text 'Password'. At the bottom of the screen, there is a purple button labeled 'START'.

Illustration 5. Login

The TIVA intervention program to promote Positive Mental Health, consists of a set of activities planned over a period of 28 days; it has 20 activities designed from Teresa Lluch's Multifactorial Model of Positive Mental Health, described in the conceptual bases section of the program (15, 16), focused on improving aspects on a personal level and in relation to care, which are set for

each day of the week, from Monday to Friday, and some additional proposals for weekends.

As indicated in the conceptual bases section, the program includes the completion of the SMP Questionnaire, before starting the program, at the end of the program, the month and three months after its completion. To complement the evaluation measures of the program, the abbreviated Zarit Questionnaire is also passed, which assesses the overhead of care and is a widely used instrument in both research and assistance. The Zarit Questionnaire is passed at the beginning and end of the program (Annex II).

The activities are designed according to the SMP Decalogue Recommendations described above, and in accordance with the objectives set out below:

SMP Recommendations	Objectives of the TIVA Programme
R1 Value positively the good things that you have in your life	Identify positive aspects in the caregiver's life and boost her self-concept and self-esteem
R2 Carry out your daily activities with love and affection	Recognize the positive aspects of family care, i.e. the good things that care brings
R3 Don't be too hard on yourself or on others	Reflect to facilitate the being tolerant, understanding and flexible with the cared for person.
R4 Don't let your negative emotions get in your way	Identify and profile the self-control of emotions
R5 Be aware of the good times in your life while they are happening	Stimulating positive memories of past and present

SMP Recommendations	Objectives of the TIVA Programme
R6 Don't be afraid of crying and showing your feelings	Learn to know, accept and manage emotions
R7 Look for places and activities that help you relax mentally	Achieve and detect spaces and activities to get mental relaxation
R8 Try to solve problems when they arise	Detect and resolve care-related issues
R9 Always take care of our interpersonal relations	Enhancing the relationship with the cared for person and other caregivers
R10 Don't forget to add humour to your life to make it more colourful	Stimulating the maintenance of a pleasant emotional tone

Table II. Relationship of the SMP Decalogue Recommendations (Lluch, 2011) to the objectives of the TIVA Programme

Program sessions

Program sessions

RECOMMENDATION 1 (R1): Value positively the good things that you have in your life.

Objective: Identify positive aspects in the caregiver's life and boost her self-concept and self-esteem

Activity 1 (R1_A1):

First step: You will need to answer the following question:

"What good things do you have in your life?"

Answers:

- "My children"
- "My partner"
- "My parents"
- "My friends"
- "My hobbies"
- "My pet"
- "Other"



Step two: *"During today, look for a moment to enjoy some of these good things you have!"*

In the event of not performing the activity, the caregiver will receive a reminder later to finish the activity: *"Have you found a moment to enjoy?"*

Yes/No

- If the answer is NO: *"Remember that you have to enjoy the good things you have."*

- If the answer is YES→ will proceed to ask if the caregiver has enjoyed the activity performed...

- If YES: *We're glad you enjoy the good things you have! Enjoy them whenever you can!"*

- If the answer is NO: *"Don't worry, things often don't go as you expect. You can discuss it with your nurse at the next visit."*

In addition, in Chronic Caregivers you have information that can help you."

Activity 2 (R1_A2):

The activity consists of the following steps:

First step: *"Please take a picture. We won't send it to anyone."*

Second step: → Look the picture and answer the following questions with a Yes or No:

I am pretty
I'm nice,
I'm cheerful,
I'm responsible,
I'm a worker,
I'm active,
I'm a caregiver,
I'm creative,
I'm flexible,
I'm kind,
I'm attentive,
I'm authentic,
I'm discreet,
I'm effective...

Step three: In everything that has answered positively, the following phrase will come out: *"These are the qualities you have!"*

In everything that has responded negatively, the following phrase will come out: *"We all have some positive quality! Think about your qualities today! You'll receive a reminder later to finish the activity. Make Tiva grow by increasing your positive mental health!"*

If the activity is not carried out, after 6 hours, the caregiver will receive a notification asking: *"Have you thought about your qualities?"*

RECOMMENDATION 2 (R2): Carry out your daily activities with love and affection.

Objective: Recognize the positive aspects of family care, that means, the good things that caregiver brings.

Activity 1 (R2_A1):

Answer the following questions:

a) *"What if you didn't take care?"*

Mark the answer that most identifies with your experience

- *"I wouldn't change anything, neither for me nor for the family member"*
- *"It would change my life and that of the family member"*
- *"There would only be changes in my life, not in the family member's life"*
- *"There would only be changes in the family member's life, not mine".*

b) *"What good things does caring bring you?"*

Mark the answer that most identifies with your experience

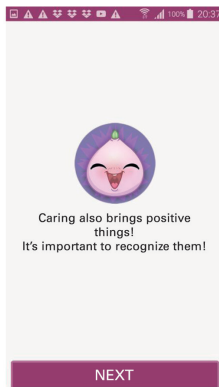


Illustration 6.
Identifying experience

- *"Nice stay"*
- *"Self-control"*
- *"Nice hotel in a great location"*
- *"Fulfillment of Duty, Love/Estimation"*
- *"Time Structuring"*
- *"Nice stay"*
- *"It doesn't bring me anything positive"*

If the caregiver selects something good: → *"Care also brings positive things to it! It's important to recognize them!"*

If the caregiver doesn't select anything good or selects that doesn't bring anything positive, the following phrases appear:

→ *"Think of something positive that helps you take care of yourself.*

The caregiver will receive a reminder later to finish the activity.

Grow Tiva by increasing your positive mental health!"

In the event of not performing the activity, after 6 hours, the caregiver will receive a notification asking: "Have you thought of something positive that will help you care?" "What good things does caring bring you?"

Answers:

- *"Nice stay"*
- *"Self-control"*
- *"Nice hotel in a great location"*
- *"Fulfillment of Duty",*
- *"Love/affection"*
- *"Time Structuring"*
- *"Nice stay"*
- *"It doesn't bring me anything positive"*

- If the caregiver thinks it doesn't bring her anything positive → *"If taking care doesn't bring you anything positive, you can always discuss it with your nurse on the next visit. Also in <http://www.cuidadorascronicos.com/cat/el-proyecto/> (31) You have information that can help you. You are not alone!"*

Activity 2(R2_A2):

Answer the following questions: "Which of these things do you enjoy most when you leave home?"

Possible answers:

- *"Go shopping"*
- *"Go to the health center"*
- *"Go to the pharmacy"*
- *"Walking through your city, town, neighborhood..."*
- *"Talk to someone"*
- *"Nice place to stay"*

If the caregiver selects any of the options → *"All right, enjoy these moments!"*.

If the caregiver does not identify any good things and selects that she does not enjoy anything → *"Pay attention to little details that go unnoticed that are good and pretty! You'll receive a reminder later to finish the activity. Grow Tiva by increasing your positive mental health!"*

In case of not performing the activity, after 6 hours, the caregiver will receive a notification reformulating the question. If the answer is again negative, it is advised to speak with nursery on the next visit. Moreover, it is recommended to visit the Website:

<http://www.cuidadorascronicos.com/cat/el-proyecto/>

And the caregiver is reminded that is not alone.

RECOMMENDATION 3 (R3): Do not be too hard on yourself or on others
Objective Facilitate being tolerant, understanding and flexible with the cared receiver.

Activity 1 (R3_A1):

Step one: Ask the caregiver to analyse a care situation: *"Think of a situation that has caused you discomfort with the care receiver. Try to think about the fact without your feelings influencing.*

– *"Recognize all the thoughts that went through your head. This thought can be an interpretation of your situation."*

Step two: analyse the same situation from the cared person: *"Analyse the same situation as if you were the cared person. Think for a moment and go to the next step:"*

Step third: answer the following question: *"Have you appreciated a change in your startup discomfort?"*

Answers:

- "Yes"
- "No"

- If yes the answer is → YES *"Good tonics for mental health! Congratulations!"*
- If the answer is → NO: *"Do not be very severe with others or with yourself. You can discuss it with your nurse at the next visit. In addition, in Chronic Caregivers (Cuidadoras crónicas) Web you have information that can help you. You're not alone!"*

Activity 2 (R3_A2):

Step one: *"Think of a situation that you have acted wrong and it causes you discomfort. Once you have it, we start!"*

Step two: Identify what feelings cause you this discomfort:

E.g. Guilt, sadness, anger...

Third step: answer the question: "Can you disconnect from this discomfort?"

Answers:

- "Yes"
- "No"

- Answer "YES" → *"All right! Recognizing our mistakes is being human and it doesn't have to affect us in our day-to-day life."*

- Answer "No" → *"Focus on improving this inner discomfort. We propose you to understand the situation and your feelings. You'll receive a reminder later to finish the activity. Grow TIVA by increasing your positive mental health!"*

In 6 hours you will receive a notification reformulating the question. If the answer is again negative, it is advised to speak with the nurse at the next visit, it is recommended to visit the website: <http://www.cuidadorascronicos.com/cat/el-proyecto/> and the caregiver is reminded that is not alone.

RECOMMENDATION 4(R4): Do not let your negative emotions get in your way.

Objective: Identify and maximize the self-control of emotions

Activity 1 (R4_A1):

First step: answer the question: *"How do you respond in front of a negative emotion? Anger, sadness, boredom..."*

Answers:

- *"I get angry and act impulsively"*
- *"I try to ignore it"*
- *"I reflect and act"*

Second step: perform a Guided Breathing exercise with mindfulness. "We propose you to practice a relaxation exercise, it will serve you on many occasions of your life!" → audio designed for the 5:40 "Chronic Caregivers" app./ Author: Anna Huguet Miquel (<https://www.youtube.com/watch?v=rNuZTchxlv4&t=83s>)

In the event of not performing the activity, 6 hours later the caregiver will receive a reminder notification: *"Knowing how we breathe helps us know how we feel. Practice mindfulness and connect with your emotions."*

Activity 2 (R4_A2):

Step forward: perform a Mindfulness Meditation: Self-observation of our ideas, thoughts, emotions and body sensations. Author: Anna Huguet Miquel (<https://www.youtube.com/watch?v=f0kVb2AMGZM&t=97s>)

Audio designed for "Cuidadoras crónicas" app (4:20 minutes).

"Reminder: Connect with your thoughts, emotions and body sensations. It will help you boost your positive mental health."

RECOMMENDATION 5 (R5): Be aware of the good times in your life while they are happening.

Objective: Stimulate positive memories of past and present.

Activity 1 (R5_A1):

Step one: Become aware of the good times of the past. To do this, the caregiver is asked: *"Look in the album of memories for a photo of a special moment."*

Step two: When you have it ready select the next button.

"Take a picture of the image you've chosen by selecting the button that appears on the screen."

Third step: *looking at the photo, answering the following questions Photo taken appears and answers "Yes", "No" to the questions:*

"Does the photo bring you joy?"

"Does the photo make you nostalgic?"

"Does the photo give you love?"

"Does the photo bring you serenity?"

"Does the photo give you security?"

"Does the photo give you solidarity?"

"Does the photo bring you happiness?" "Does the photo make you sad?"

"Does the photo make you love?"

"Does the photo give you pleasure?"

"Does the photo give you melancholy?" "Does the photo give you euphoria?"

"Does the photo give you hope?"

"Does the photo give you optimism?"

- Answer "Yes" → "This is your memory, keep it!"
- Answer "No" to all questions → "I'm sure it conveys some positive feeling to you. Think about it. You'll receive a reminder later to finish the activity. Grow Tiva by increasing your positive mental health!"
 - In 6 hours you will receive a notification reformulating the question. If the answer is negative again, it is advised to speak to nursing at the next visit, you are advised to visit the website <http://www.cuidadorascronicos.com/cat/el-proyecto/> And the caregiver is reminded that is not alone.

Activity 2 (R5_A2):

Step one: Become aware of the good times of the present. To do this "We propose you to listen to music while you take care of it. What do you want to hear?"

Choose a song according to the mood you want to boost"

Answers:

- "1. I Will Survive – Force"
- "2. Walking on Sunshine – Joy"
- "3. The Final Countdown – Determination"
- "4. I Will Resist (Resistire) – Overcoming"
- "5. Imagine – Hope"
- "6. I will always Love you – Love"

* Once you have chosen the option you will be redirected to the song in question

Step two: after finishing the activity you will receive the following message:→
"Music helps us in many ways: relax, encourage us, disconnect... Don't forget it's a very useful resource!"

RECOMMENDATION 6 (R6): Don't be afraid of crying and showing your feelings.

Objective: Learn to know, accept and manage emotions.

Activity 1 (R6-A1):

Step one. Answer the question: "Which of these emotions do you want to remove from your life?"

Answers:

- "Love"
- "Fear"
- "Joy"
- "Sadness"
- "Anger"
- "Boredom"
- "Satisfaction"
- "dissatisfaction"



Illustration 7. Identifying emotions

- If the caregiver selects any option → *"All emotions are part of your life. Deleting them is not the solution. We can learn to manage them." "Remember that emotions are part of us. Accepting and controlling them is a goal to achieve."*

- If the caregiver does not select anything → *Congratulations! You don't have to eliminate any of the emotions, they're all important."*

Activity 2 (R6_A2): Caregiver's Emotion Diary.

"These are the emotions you've felt this week. All are necessary"

(Emotion chart)

"Do you consider that these emotions limit you in your life?"

Answers:

- *"A lot"*
- *"Quite"*
- *"A little bit"*
- *"Nothing"*

"Remember that it is necessary that emotions do not condition your day to day. It is important to feel, but also to accept and channel them to dominate them."

"Are you satisfied with the result of emotions these days?"

Answers:

- *"Yes"*
- *"No"*

- If the answer is YES → *"We're glad that emotions don't limit you in your day-to-day life. Congratulations on knowing how to take them!"*

- If the answer is NO → *"We have to learn to carry emotions without being overflowed. If emotions cause you problems, discuss it with your nurse at the next visit. Also in:*

<http://www.cuidadorascronicos.com/cat/el-proyecto/>

You'll find information that can help you. You're not alone!!!"

Activity 3 (R6_A3): Accept and manage emotions II.

"What emotions have affected you this week?"

Answers

- *"Anger"*
- *"Sadness"*
- *"Surprise"*
- *"Fear"*
- *"Shame"*
- *"Disgust"*
- *"Boredom"*
- *"Dissatisfaction"*

- The caregiver has selected some emotion: → *"All emotions will help you improve!"*

"ANGRY

It helps you defend yourself and/or demand something you think is right"

"SADNESS

It helps you accept the loss and/or get help when you need it"

"SURPRISE

It allows you to deal with unexpected situations"

"FEAR

It helps you: be alert, run away or fight"

"SHAME

It protects your privacy and that of yours and prevents you from acting out of place"

"DISGUST

It protects you from substances and circumstances that may be harmful to you"

"BOREDOM

It can be a space of rest and personal exploration that allows reflection and / or help make decisions"

"DISSATISFACTION

It allows you to be nonconformist and look for positive alternatives to change what's in your hands."

- The caregiver has not selected anything → *"All emotions will help you get better! You'll receive a reminder later to finish the activity. Grow Tiva by increasing your positive mental health!"*
- In 6 hours you will receive a notification reformulating the question.

RECOMMENDATION 7: Look for places and activities that help you relax mentally.

Objective: To achieve spaces and activities to obtain mental relaxation.

Activity 1 (R7_A1R7_A1): Empower activities to relax.

"Search 10 to 30 minutes to do something you like. As for example: Take a bath, take a nap, watch TV, chat with someone, read or garden. You'll receive a reminder later to finish the activity.

Grow Tiva by increasing your positive mental health!"

In 6 hours: notification asking the caregiver if she has relaxed.

"What activity have you done?"

Answers:

- *"bath"*
- *"nap"*
- *"Watch TV"*
- *"Talk to someone"*
- *"Read"*
- *"Gardening"*
- *"Other"*

"Have you relaxed?"

Answers:

- *"Yes"*
 - *"No"*
 - *The caregiver replied "YES" → "We're glad you're taking advantage of these minutes of disconnection! Take advantage of them whenever you can."*
 - *The caregiver has answered "NO"→ "Having a space for you is essential for your well-being. Manage your time and try again. Take a few minutes! You'll receive a reminder later to finish the activity. Grow Tiva by increasing your positive mental health!"*
 - *In 6 hours the caregiver will receive a notification reformulating the question. If the answer is again negative, it is advised to speak to nursing at the next visit and visit the website: <http://www.cuidadorascronicos.com/cat/el-proyecto/>*
- Moreover, the App send a support message reminding that the caregiver is not alone.

Activity 2 (RR7_A2): Find spaces to obtain mental relaxation.

"What sounds would you like to hear to relax? Shrink one and relax when you have a moment for yourself. Enjoy! If you have headphones, put them on to listen better."

Answers:

- *"Waves of the sea"*
- *"Water"*
- *"Great rain"*
- *"Rain on the roof"*
- *"Jungle"*
- *"Fire"*

*Once you have chosen the option you will be redirected to the song in question.

"Have you relaxed?"

Answers:

- *"Yes"*
- *"No"*

- The caregiver replied "Yes" → *"We're glad! This technique will help you release the accumulated stress."*

- The caregiver replied "No" → *"Choose the right place to relax and try again. Learning will help you release the accumulated stress." You'll receive a reminder later to finish the activity. Grow Tiva by increasing your positive mental health!"*

- In 6 hours you will receive a notification reformulating the question. If the answer is negative again, it is advised to speak to nursing at the next visit, and visit the <http://www.cuidado-rasronicos.com/cat/el-proyecto/>

And the app send a support message reminding the caregiver that is not alone

RECOMMENDATION 8 (R8): Try to solve problems when they arise.

Objective: Detect and solve problems arising from care

Activity 1 (R8_A1): The Wheel of Care.

"Some of the things we have to help with as caregivers can be difficult and exhausted. Consider the following types of tasks and answer questions honestly."

Illustration 8. Level of difficulty of the caregiver in care-related activities:

"What level of difficulty do you assign to the next task? FOOD"

Answers:



"Difficult"



"Medium"



"Easy"

*"What level of difficulty do you assign to the next task?
MOBILIZATION-TRANSPORT"*

Answers:



"Difficult"



"Medium"



"Easy"

*"What level of difficulty do you assign to the next task?
RELATIONSHIP AND COMMUNICATION"*

Answers:



"Difficult"



"Medium"



"Easy"

*"What level of difficulty do you assign to the next task?
MEDICATION"*

Answers:



"Difficult"



"Medium"



"Easy"

*"What level of difficulty do you assign to the next task?
HIGIENE"*

Answers:



"Difficult"



"Medium"



"Easy"

*"What level of difficulty do you assign to the next task?
FREE TIME ACTIVITIES"*

Answers:



"Difficult"



"Medium"



"Easy"

"What task do you commit to improve?"

Answers:

- *"Feeding"*
- *"Mobilization-transport"*
- *"Relationship and communication"*
- *"Medication"*
- *"Hygiene"*
- *"Free time activities"*

*"Who will you contact to help you improve it?
I will contact..."*

Answers:

- *"Nurse – Physician"*
- *"Chronic Caregivers"*
- *"Social Assistant"*
- *"Family"*
- *"I won't contact anyone"*

- If the caregiver answers that will contact someone → *"All right! We must try to solve the problems that appear to us."*

- If the caregiver has selected "I will not contact anyone" → *"Knowing how to delegate tasks or receive help is very important for your mental health. If problems build up, mental health trembles! Value the resources you have available."*

"You can discuss it with your nurse at the next visit. Also on the Web: <http://www.cuidadorascronicos.com/cat/el-proyecto/>

You have information that can help you. You're not alone!!!"

Activity 2 (R8_A2): The Care Wheel II.

"As we've already seen, some of the things we have to help with as caregivers can be difficult and exhausted.

Consider the following types of tasks and answer questions honestly."

The same questions are asked again as in the previous activity: R8A1.

"Do you see positive changes between the first and second time you've done the exercise?"

Answers:

- *"Yes"*
- *"No"*

- The caregiver answered "Yes" → *"Congratulations! This step forward will help you in the care."*

- He /she has answered "No" → *"Knowing how to delegate tasks or receive help is very important for your mental health. What you've proposed may be hard to come by right now. You can discuss it with your nurse at the next visit. Also in <http://www.cuidadorascronicos.com/cat/el-proyecto/> You have information that can help you. You're not alone!!!"*

RECOMMENDATION 9 (R9): Always take care of our interpersonal relations.

Objective: To strengthen the relationship with the cared person and with other caregivers

Activity 1 (RR9_A1): Sharing a meal with the person cared for.

"Share a meal with the person you care for and take a picture of the moment. You'll receive a reminder later to finish the activity.

Grow Tiva by increasing your positive mental health!

**The caregiver will receive a notification: "How was the meal?" "Was the meal profitable?"*

Answers:

- *"Yes"*
- *"No"*

- The caregiver replied "Yes" → *"We're glad! We can always enjoy small moments"*

- The caregiver replied "No" → *"Let's hope the next time you enjoy it."*

Activity 2 (R9_A2): Chatting with other caregivers through the Chronic Caregivers web

"Introduce yourself and meet other caregivers." → Website: Chronic caregivers.

"Has it been nice to chat with other caregivers?"

Answers:

- "Yes"
- "No"
- The caregiver replied "Yes" → "We're glad!"
- The caregiver answered "No" → "Don't worry, a lot of times things don't go as you expect. We can always try again."

Activity 3 (R9_A3): Talk to our loved ones.

"Do you dare to talk to a person you haven't contacted in a long time?"

"Who do you choose?"

Answers:

- "Friend"
- "Partner"
- "Family"
- "Neighbour"
- "Others"

"You'll receive a reminder later to finish the activity. Grow Tiva by increasing your positive mental health!"

*Notification after 1 hour: "Have you been able to talk to anyone?" Answers: Yes/no

- If the answer is **YES** → "perfect!"
 - "How was the conversation?"

Answers

Illustration 9. Review of experience



"Great"



"good"



"Regular"



"pretty bad"

"Would you repeat?"

Answers:

- "Yes" → "we are glad you enjoy these moments!"
- "No" → Don't worry, a lot of times things don't go as you expect. We can always try again."

- If the answer is **NO** → "Find a moment to talk to someone, it will help you feel better!"

RECOMMENDATION 10: Don't forget to add humour to your life to make it more colourful.

Objective: To stimulate the maintenance of a pleasant emotional tone

This recommendation ends with a free, uncoded activity, to stimulate a sense of humor, something completely personal. The caregiver is attempted to re-meate a situation lived in humour.

Illustration 10. Last Decalogue Recommendation



*Do not forget to add
humour to your life to
make it more colourful.*

(Lluch, 2011)

General schedule of the TIVA Program

General schedule of the TIVA Program

The 20 activities that configure the TIVA program, as well as the motivational phrases, are distributed according to the summary table of the implementation of the TIVA program.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<p>1</p> <p>Motivational Quote</p> <p>You can have little and be rich. Boris Kovalik.</p> <p>How do you feel? R1 A3</p> <p>Did you find it useful?</p>	<p>2</p> <p>Motivational Quote</p> <p>Let your smile change the world. But don't let the world change your smile. Michele Siles</p> <p>How do you feel? R1 A2</p> <p>Did you find it useful?</p>	<p>3</p> <p>Motivational Quote</p> <p>Don't look for the perfect time, just look for the moment and make it perfect. Anonymous.</p> <p>How do you feel? R5 A2</p> <p>Did you find it useful?</p>	<p>4</p> <p>Motivational Quote</p> <p>What you do today can improve all your mornings. Ralph Marston.</p> <p>How do you feel? R8 A1</p> <p>Did you find it useful?</p>	<p>5</p> <p>Motivational Quote</p> <p>If you don't have time for the little things, you won't have it for the big ones. Richard Branson.</p> <p>How do you feel? R9 A3</p> <p>Did you find it useful?</p>	<p>6</p> <p>Motivational Quote</p> <p>The art of being happy lies in the power to extract happiness from common things. Henry Ward Beecher.</p> <p>How do you feel?</p> <p>Weekend message</p>	<p>7</p> <p>Motivational Quote</p> <p>As long as the storm is, the sun always shines again in the clouds. Khalil Gibran.</p> <p>How do you feel?</p> <p>Weekend message</p>
<p>8</p> <p>Motivational Quote</p> <p>There are always flowers for those who want to see them. Henri Matisse.</p> <p>How do you feel? R2 A2</p> <p>Did you find it useful?</p>	<p>9</p> <p>Motivational Quote</p> <p>You can't stop the sadness bird from flying over your head, but you can prevent it from nesting in your hair. Chinese Proverb.</p> <p>How do you feel? R6 A1</p> <p>Did you find it useful?</p>	<p>10</p> <p>Motivational Quote</p> <p>To understand everything, is necessary to forgive everything. Lev Tolstoy.</p> <p>How do you feel? R3 A1</p> <p>Did you find it useful?</p>	<p>11</p> <p>Motivational Quote</p> <p>Take care of your body. It's the only place you'll really live forever. Anonymous.</p> <p>How do you feel? R4 A1</p> <p>Did you find it useful?</p>	<p>12</p> <p>Motivational Quote</p> <p>Some people make your laughter a little louder, your smile a little brighter and your life a little better. Anonymous.</p> <p>How do you feel? R9 A1</p> <p>Did you find it useful?</p>	<p>13</p> <p>Motivational Quote</p> <p>A wise doctor said, "The best medicine is love and care." Someone asked him, "What if it doesn't work? He smiled and replied: Increase the dose. Paulo Coelho.</p> <p>How do you feel?</p> <p>Weekend message</p>	<p>14</p> <p>Motivational Quote</p> <p>Life is an opportunity. Take advantage of it! Teresa of Calcutta.</p> <p>How do you feel?</p> <p>Weekend message</p>
<p>15</p> <p>Motivational Quote</p> <p>...Sometimes, getting out of the routine a little bit is just what you need. Anonymous.</p> <p>How do you feel? R7 A1</p> <p>Did you find it useful?</p>	<p>16</p> <p>Motivational Quote</p> <p>After great moments, unforgettable memories remain. Anonymous.</p> <p>How do you feel? R5 A1</p> <p>Did you find it useful?</p>	<p>17</p> <p>Motivational Quote</p> <p>Fear is natural in the prudent, and to know how to overcome it is to be courageous. Alonso de Ercila.</p> <p>How do you feel? R6 A3</p> <p>Did you find it useful?</p>	<p>18</p> <p>Motivational Quote</p> <p>Live life to the fullest and focus on the positive. Matt Cameron.</p> <p>How do you feel? R7 A2</p> <p>Did you find it useful?</p>	<p>19</p> <p>Motivational Quote</p> <p>Being happy is a decision that must be made everyday. Frida Kahlo.</p> <p>How do you feel? R1 A1</p> <p>Did you find it useful?</p>	<p>20</p> <p>Motivational Quote</p> <p>Feelings are the way the soul is expressed. Marta Ayala.</p> <p>How do you feel?</p> <p>Weekend message</p>	<p>21</p> <p>Motivational Quote</p> <p>The art of living is not about eliminating problems, but about growing up with them. Stamatias.</p> <p>How do you feel?</p> <p>Weekend message</p>
<p>22</p> <p>Motivational Quote</p> <p>Present is the only time we have any dominion, live it and enjoy it. Anonymous.</p> <p>How do you feel? R4 A3</p> <p>Did you find it useful?</p>	<p>23</p> <p>Motivational Quote</p> <p>You may be only a person to the world, but for someone, you are the world. Gabriel Garcia Márquez.</p> <p>How do you feel? R2A1</p> <p>Did you find it useful?</p>	<p>24</p> <p>Motivational Quote</p> <p>Bravery does not always roar. Sometimes it's the little voice that at the end of the day tells you, "I'll try again tomorrow." Mary Anne</p> <p>How do you feel? R3 A2</p> <p>Did you find it useful?</p>	<p>25</p> <p>Motivational Quote</p> <p><i>We cannot choose our emotions, but we can do with them.</i> Fatima Sriván Franco.</p> <p>How do you feel? R6 A2</p> <p>Did you find it useful?</p>	<p>26</p> <p>Motivational Quote</p> <p>Friendship doubles our joys and divides our problems. Anonymous.</p> <p>How do you feel? R9 A2</p> <p>Did you find it useful?</p>	<p>27</p> <p>Motivational Quote</p> <p>To achieve this, it is necessary to create; to create you need to believe; and to believe you need to trust. Alex Rovira</p> <p>How do you feel?</p> <p>Weekend message</p>	<p>28</p> <p>Motivational Quote</p> <p>Do not forget to add humour to your life to make it more colourful! Teresa Lluich</p> <p>How do you feel? <i>Final image of progress</i></p> <p>Last sentence R10</p>

Table III: Schedule

Program evaluation

Program evaluation

Any intervention program requires an assessment of its effectiveness for which it has been created. And TIVA program has been evaluated following the procedure of aleatorized Clinical Trial with an experimental group and a control group. Registered with Clinical Trials: ISRCTN14818443 (date: 24/05/2019) (32) applying the following instruments: SMP questionnaire at the beginning of the Program, finalizing the intervention, per month and at 3 months. The Zarit caregiver overload scale at the beginning and end of the intervention and questionnaires designed "ad-hoc" for satisfaction and usability research at the end of the intervention (Anex III).

This program has been created and validated in the context of a research project entitled Effectiveness of a program to promote Positive Mental Health through the Web and App: "*Chronic Caregivers*": Randomized Clinical Trial, and has been supported by Carlos III Institute Health Research Fund (FIS) with file number PI16 / 01576 and has been co-financed by the European Regional Development Fund (ERDF). It is coordinated by the lead researchers: Dr. Carme Ferré Grau and Dr. Núria Albacar Riobóo. The team consists of research professors from the University of Barcelona, the Bellvitge Health Sciences Campus and Sant Joan de Déu University Campus; University of Alicante; Rovira i Virgili University, and by nurses responsible for different Basic Areas of Camp de Tarragona, Terres de l'Ebre and Barcelona. Dr. Teresa Lluch Canut, Dr. María Ferré Bergada, Dr. Dolores Miguel Ruiz, Dr. Montserrat Puig Llobet, Dr. Mar Lleixà Fortuño, Dr. Laia Raigal Aran, Dr. Ruth Martí Arqués, Dr. Montserrat Boqué Cavallé, Dr. Ma Aurlia Sánchez, Dr. Juan Roldan Merino, Dr. José Ramon Martínez, Jael Lorca Cabrera, Monica Mulet, and Belen Vargas.

In this team there are members of different consolidated research groups: Advanced Nursing (2017 SGR 1030) and Smart Health of the URV and GEI-MAC-Group of studies of invariancia de ltomeasure and analysis of change, in the social and health fields (2017 SGR-1681).

The development of fieldwork has been implemented by Primary Care nurses from these Health Regions, with the support of the explanatory dossier, carried out for research.

The results of the clinical trial demonstrated the effectiveness of the Program in the following aspects: In relation to caregiver's overload, there were statistically significant differences ($p = 0.003$) between the Control Group (GC) and Experimental Group (GE) in relation to the decrease in Zarit scores, after the intervention. In contrast, in the Control Group (GC) the overload values increased.

Regarding the scores obtained on the SMP scale: Statistically significant differences were obtained in the Overall Scale and by Factors per month and three months of intervention between GE and GC (11.43; $p < 0.00$). The most relevant factors were: Factor F1-Satisfaction Personal ($p = 0.001$), factor F2-Rosocial Patti-tude ($p = 0.002$), factor F5 de relación -Rsolution of oaksand Autoactualization and factor F6-Habilidades of interpersonal relationship ($p = 0.002$). Astatistically significant difference was also obtained between GE and GC in factor F3-Auto-control and factor F4-Autonomy, but the difference was not clinically relevant ($p = 0.004$)

In the satisfaction and usability questionnaire, the operating system obtained a very high response rate (93%.of users). In relation to satisfaction,it highlights the highest score in the assessment of motivating phrases and in relation to the TIVA character; activities were considered easy to carry out; el 93% of users would recommend the App to other caregivers, and 56% of users would recommend that the intervention should be prolonged over time.

Thank you very much to all participating caregivers and all members of the Research Team!!!!



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Annex

Annex I: Luch Positive Mental Health Questionnaire

Luch Positive Mental Health Questionnaire-CSMP (1999): Items that make it up, distribution of items by factors and maximum and minimum values of each factor and the overall questionnaire.

Positive Mental Health Questionnaire		Always or almost always	Quite often	Sometimes	Never or almost never
1	I find it especially difficult to accept others when they have different attitudes than mine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Problems.... block me easily	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	I find it especially difficult to listen to people who tell me about their problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	I like the way I am.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 I'm able to control myself when I experience negative emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 I feel about to explode.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	For me, life is... boring and monotonous.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	I find it especially difficult to give emotional support.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	I have difficulty establishing deep and fulfilling interpersonal relationships with some people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 I'm very concerned about what others think of me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	I think I have a lot of ability to put myself in the place of others and understand their answers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	I see my future with pessimism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	The opinions of others influence me a lot when it comes to making my decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	I consider myself a less important person than the rest of the people around me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	I'm able to make decisions for myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Positive Mental Health Questionnaire		Always or almost always	Quite often	Sometimes	Never or almost never
16	I'm trying to get the positives out of the bad things that happen to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	I'm trying to improve as a person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	I consider myself "a good psychologist"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	I'm worried that people will criticize me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 I think I'm a sociable person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 I'm able to control myself when I have negative thoughts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	... I'm able to maintain a good level of self-control in the conflicting situations of my life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 I think I'm a trustworthy person.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	I find it especially difficult to understand the feelings of others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	... I think about the needs of others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	If I am experiencing unfavorable external pressures I am able to continue maintaining my personal balance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	When there are changes in my environment ... I'm trying to adapt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	In front of a problem ... I'm able to apply Information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	The changes that occur in my Usual routine stimulate me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	Tengo dificultades para relacionarme abiertamente con mis profesores/jefes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	... I think I'm useless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	... I try to develop and enhance my good Skills.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33	... I find it difficult to have personal opinions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34	When I have to make important decisions..... I feel very insecure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35 I'm able to say no when I mean no	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Positive Mental Health Questionnaire		Always or almost always	Quite often	Sometimes	Never or almost never
36	When I'm faced with a problem I try to find possible solutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37 I like to help others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38 I feel dissatisfied with myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39	I feel dissatisfied with my physical appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Factor distribution of Ítems deCSMP Items and maximum and minimum values of mínimos each factor and the overall questionnaire

Factors	Items	Maximum and minimum values
F1: Personal satisfaction	4*, 6, 7, 12, 14, 31, 38, 39	8 - 32
F2: Prosocial attitude	1, 3, 23*, 25*, 37*	5 - 20
F3: Self-control	2, 5*, 21*, 22*, 26*	5 - 20
F4: Autonomy	10, 13, 19, 33, 34	5 - 20
F5: Troubleshooting and self-update	15*, 16*, 17*, 27*, 28*, 29*, 32*, 35*, 36*	9 - 36
F6: Interpersonal relationship skills	8, 9, 11*, 18*, 20*, 24, 30	7 - 28
CSMP Total		39 - 156

* Negative items to invest

Higher score, better levels of Positive Mental Health

Annex II: Zarit Abbreviated Scale

1. Do you feel that because of the time you spend with your relative that you do not have enough time for yourself?

1. Never 2. rarely 3. sometimes 4. frequently 5. almost always

2. Do you feel stressed between caring for your relative and trying to meet other responsibilities?

1. Never 2. rarely 3. sometimes 4. frequently 5. almost always

3. Do you feel that your situation currently affects your relationship with other family members or friends in a negative way?

1. Never 2. rarely 3. sometimes 4. frequently 5. almost always

4. Do you feel strained when you are around your relative?

1. Never 2. rarely 3. sometimes 4. frequently 5. almost always

5. Do you feel that your health has suffered because of your involvement with your relative?

1. Never 2. rarely 3. sometimes 4. frequently 5. almost always

6. Do you feel you have lost control of your life since your relative's illness?

1. Never 2. rarely 3. sometimes 4. frequently 5. almost always

7. In general, do you feel overburdened with taking care of your family member?

1. Never 2. rarely 3. sometimes 4. frequently 5. almost always

*At the beginning of the intervention, at 3 months and at the end of the intervention.

Annex III:

Satisfaction and Usability test

How easy has it been for you to answer to “How do you feel”?

- Very easy
- Easy
- Difficult
- Very difficult

Have the daily phrases increased your mental well-being?

- Yes
- No

Did you find the activities easy?

- Very easy
- Easy
- Difficult
- Very difficult

Has the evolution and / or growth of TIVA encouraged you to continue using the mobile app?

- Yes
- No

Would you recommend the mobile application to other caregivers?

- Yes
- No

What would you improve about the mobile application?

- The game with TIVA and the scores achieved
- Daily motivational phrases
- Some activities provided

- It would extend the time of the intervention
- I am completely satisfied with the program

If you have selected to improve something in the application, please detail it below to help us make the appropriate changes:

.....

.....

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Annex IV

Explanatory dossier for professionals

Effectiveness of a program to promote Positive Mental Health through the Web and APP “Cuidadoras/es crónicos”: Randomized clinical trial.



UNIVERSITAT ROVIRA I VIRGILI



Fondo Europeo
de Desarrollo Regional
"Una manera de hacer Europa"

This project has a FIS funding, from the Health Research Fund of the Carlos II Institute, with file number PI16 / 01576 and co-financed by the European Regional Development Fund (ERDF).

The project is entitled: Effectiveness of a program to promote Positive Mental Health through the Web and APP “Cuidadoras crónicas”: Randomized clinical trial.

It is coordinated by the principal investigators: Carme Ferré Grau y Núria Albarca Riobóo

The group is composed of the following researchers and collaborators:

Carme Ferré Grau	Teresa Lluch-Canut	Montserrat Boqué
Núria Albarca Riobóo	Dolors Miguel Ru	Gerard Mora López
Maria Ferré Bergadà	Montserrat Puig Llobet	Belén Vargas
Mar Lleixà Fortuño	Anna Falcó Pegueroles	Ma Aurèlia Sánchez
Jael Lorca Cabrera	Joan Roldán Merino	Mónica Mulet
Laia Raigal Aran	Rafael del Pino Casado	José Ramón Martínez
Rut Martí Arqués	Amalía Morro	

The project works with the support of the research groups of the Rovira i Virgili University:

Advanced nursing (2017 SGR 130)
Nursing Department

Smart Health
Computer Engineering and
Mathematics Department

Illustrations by: Sr. Raúl Martínez Ruiz

Project presentation and thanks



Good morning nurse,
My name is Tiva, and on behalf of the entire research team, I would like to thank you for participating in this project, which they have put so much energy and enthusiasm into. It's because of them I exist! But now it is you and your caregivers who have to help me grow! Are you up for it?

First of all, I would like to tell you how this project came about and how we got here. It all started in 2013, with the creation of the **website "cuidadoras-cronicos.com"**.

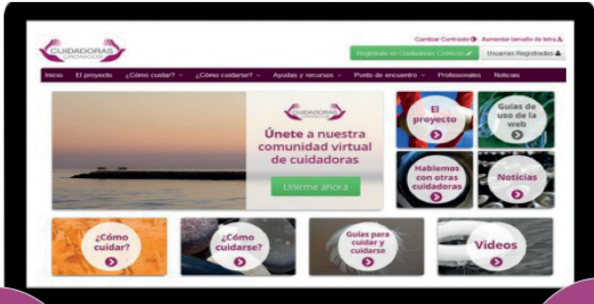
This website was created with the aim of being a support tool for those people who have to offer continuous family assistance to dependent people (as in your case). This situation can be stressful and lead to important manifestations in all areas of the caregiver.

Often accompanied by feelings of loneliness and fatigue, the daily reality makes it difficult for these people to have face-to-face support and it is for this reason that an online resource has been created where, from their own home and accompanied by the person they are caring for, they can take advantage of this tool, in a complementary way to conventional one-on-one assistance. The idea is that through the web page, which has a virtual community, information, advice and support for these people will be provided.

The **main goal** is to reduce caregiver burden, increasing the quality of life and the perception of social support. All this, with a direct positive impact on the care receiver.

This website is a free resource, accessible from any device, which also offers a virtual community.

There are sections on how to take care, how to take care of yourself, resources and help. In 2016, the first evaluation of the impact of this website was completed with the following results:



The screenshot shows the website's main page with a navigation bar at the top containing links like 'Inicio', 'El proyecto', '¿Cómo cuidar?', '¿Cómo cuidarse?', 'Apoyos y recursos', 'Plata de encuentro', 'Profesionales', and 'Noticias'. The main content area features a large banner with the text 'Únete a nuestra comunidad virtual de cuidadoras' and a 'Únete ahora' button. Below the banner are several circular tiles with icons and text: '¿Cómo cuidar?', '¿Cómo cuidarse?', 'Guías para cuidar y cuidarse', 'Videos', 'El proyecto', 'Guías de uso de la web', 'Hablemos con otras cuidadoras', and 'Noticias'.

Current users: 54.306

The website is addressed to:
- Caregivers
- Family associations
- Health professionals and agents

Website rating: 7,9



A world map is displayed with a grayscale intensity scale at the bottom, ranging from 1 to 20,981. A circular callout on the left side of the map is labeled 'Website engagement'. A purple circular callout on the right side of the map indicates '53 different countries'.

Website engagement

53 different countries

A great success, don't you think?

But now we want to go further and this is where you come in!

In the last few months, the research team has been working steadily on an innovative idea that will actively help caregivers.

It is a phone application! Yes, yes, an APP!

This research team is on the cutting edge, don't you think?

Well, let me tell you a bit more about this APP. It's a program to enhance Positive Mental Health (PMH).

“The SMP concept relates to an approach that moves away from the psychopathological perspective (mental disorders) and understands mental health as a state of optimal functioning, which promotes the qualities of the person and facilitates their greatest development”



For 28 days, caregivers will perform daily activities on their mobile devices focused on improving both personal and caregiving aspects. But we need caregivers who want to participate and see if the impact of this tool is useful.

And this is where we need your help!

In the following pages I will tell you how to choose the participants and guide them on this journey to improve their SMP and in the meantime, help me to grow!

Practical instructions for data collection

STEP 1: Choosing the Caregiver Sample

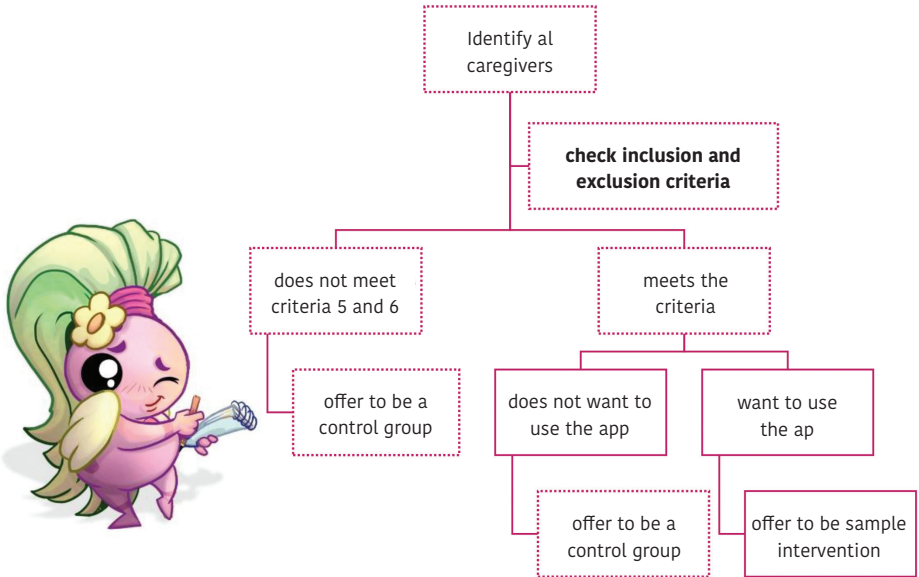
Below is a summary outline of the steps to follow to collect sample. The sample can be control (does not perform the program with the App), or intervention (will use the App). To consider caregivers, we must consider two aspects: the criteria of inclusion and the willingness to participate. Here are the inclusion criteria and a schematic to decide what type of sample it is:

Inclusion criteria:

1. Primary/secondary and formal/informal family caregivers of chronically ill patients.
2. Over 18 years old.
3. Minimum of 4 months of experience in the care of the sick.
4. Knowledge of the Spanish or Catalan language.
5. Caregivers using a mobile device and WhatsApp.
6. Access to a mobile device with Android operating system with Internet access.
7. Signature of Informed Consent

Exclusion criteria

- caregivers with cognitive impairment



STEP 2: Deliver "Dossier for participant" (depending on case control or intervention case)

STEP 3: Signing informed consent



STEP 4: Inform the nurse responsible for the caregiver participating in the study and initiate the intervention or collection of case data controls (follow the Instructions as the case may be). Agree on the start date (always on Monday).

→ **CONTROL GROUP**

START	• Fill the "initial questionnaires" document
FIRST MONTH	• Fill the "first month questionnaire" document
THIRD MONTH	• Fill the "third month questionnaire" document

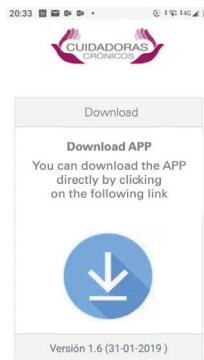
→ **INTERVENTION GROUP**

PRE-START	• Install app on the caregiver's mobile
START	• Fill the "initial questionnaires" document
FOLLOW-UP THIRD MONDAY	• call or quote the caregiver to ask about the app
FINAL APP PROGRAM (From the 29th day of the start)	• Fill the "first month questionnaire" document
THIRD MONTH	• Fill the "third month questionnaire" document

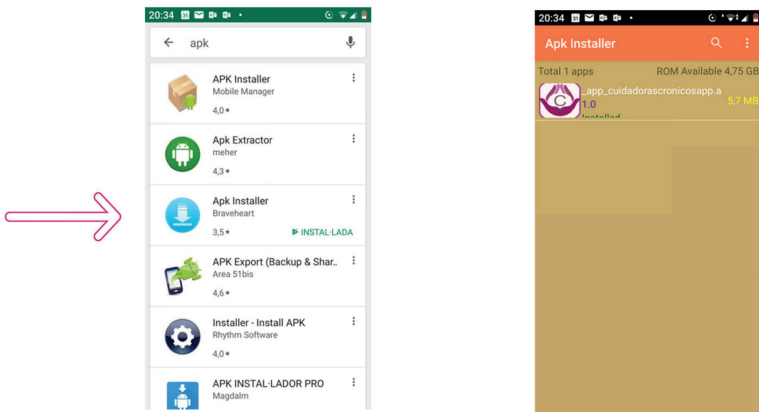
More information on intervention cases

APP instalation

Access <http://www.cuidadorascronicos.com/web/infoApp.php> from your mobile phone and download the App.



* If the icon does not appear, download the app from PlayStore APK installer. When you open the App, the icon of the caregiver app should appear in order to install it.



Summary TIVA Program to promote Positive Mental Health through the 'Cuidadoras Crónicas' App

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<p>1</p> <p>Motivational Quote</p> <p>You can have little and be rich. Boris Kovalik.</p> <p>How do you feel? R1 A3</p> <p>Did you find it useful?</p>	<p>2</p> <p>Motivational Quote</p> <p>Let your smile change the world. But don't let the world change your smile. Michele Stiles</p> <p>How do you feel? R1 A2</p> <p>Did you find it useful?</p>	<p>3</p> <p>Motivational Quote</p> <p>Don't look for the perfect time, just look for the moment and make it perfect. Anonymous.</p> <p>How do you feel? R5 A2</p> <p>Did you find it useful?</p>	<p>4</p> <p>Motivational Quote</p> <p>What you do today can improve all your mornings. Ralph Marston.</p> <p>How do you feel? R8 A1</p> <p>Did you find it useful?</p>	<p>5</p> <p>Motivational Quote</p> <p>If you don't have time for the little things, you won't have it for the big ones. Richard Branson.</p> <p>How do you feel? R9 A3</p> <p>Did you find it useful?</p>	<p>6</p> <p>Motivational Quote</p> <p>The art of being happy lies in the power to extract happiness from common things. Henry Ward Beecher.</p> <p>How do you feel? Weekend message</p>	<p>7</p> <p>Motivational Quote</p> <p>As long as the storm is, the sun always shines again in the clouds. Khalil Gibran.</p> <p>How do you feel? Weekend message</p>
<p>8</p> <p>Motivational Quote</p> <p>There are always flowers for those who want to see them. Henri Matisse.</p> <p>How do you feel? R2 A2</p> <p>Did you find it useful?</p>	<p>9</p> <p>Motivational Quote</p> <p>You can't stop the sadness from flying over your head, but you can prevent it from nesting in your hair. Chinese Proverb.</p> <p>How do you feel? R6 A1</p> <p>Did you find it useful?</p>	<p>10</p> <p>Motivational Quote</p> <p>To understand everything, is necessary to forgive everything. Lev Tolstoy.</p> <p>How do you feel? R3 A1</p> <p>Did you find it useful?</p>	<p>11</p> <p>Motivational Quote</p> <p>Take care of your body. It's the only place you'll really live forever. Anonymous.</p> <p>How do you feel? R4 A1</p> <p>Did you find it useful?</p>	<p>12</p> <p>Motivational Quote</p> <p>Some people make your laughter a little louder, your smile a little brighter and your life a little better. Anonymous.</p> <p>How do you feel? R9 A1</p> <p>Did you find it useful?</p>	<p>13</p> <p>Motivational Quote</p> <p>A wise doctor said, "The best medicine is love and care." Someone asked him, "What if it doesn't work?" He smiled and replied: Increase the dose. Paulo Coelho..</p> <p>How do you feel? Weekend message</p>	<p>14</p> <p>Motivational Quote</p> <p>Life is an opportunity. Take advantage of it! Teresa of Calcutta.</p> <p>How do you feel? Weekend message</p>
<p>15</p> <p>Motivational Quote</p> <p>Sometimes, getting out of the routine a little bit is just what you need. Anonymous.</p> <p>How do you feel? R7 A1</p> <p>Did you find it useful?</p>	<p>16</p> <p>Motivational Quote</p> <p>After great moments, unforgettable memories remain. Anonymous.</p> <p>How do you feel? R5 A1</p> <p>Did you find it useful?</p>	<p>17</p> <p>Motivational Quote</p> <p>Fear is natural in the prudent, and to know how to overcome is to be courageous. Alonso de Ercilla.</p> <p>How do you feel? R6 A3</p> <p>Did you find it useful?</p>	<p>18</p> <p>Motivational Quote</p> <p>Live life to the fullest and focus on the positive. Matt Cameron.</p> <p>How do you feel? R7 A2</p> <p>Did you find it useful?</p>	<p>19</p> <p>Motivational Quote</p> <p>Being happy is a decision that must be made everyday. Frida Kahlo.</p> <p>How do you feel? R1 A1</p> <p>Did you find it useful?</p>	<p>20</p> <p>Motivational Quote</p> <p>Feelings are the way the soul is expressed. Maria Ayala. Samateas.</p> <p>How do you feel? Weekend message</p>	<p>21</p> <p>Motivational Quote</p> <p>The art of living is not about eliminating problems, but about growing up with them. Samateas.</p> <p>How do you feel? Weekend message</p>
<p>22</p> <p>Motivational Quote</p> <p>Present is the only time we have any dominion, live it and enjoy it. Anonymous.</p> <p>How do you feel? R4 A3</p> <p>Did you find it useful?</p>	<p>23</p> <p>Motivational Quote</p> <p>You may be only a person to the world, but for someone, you are the world. Gabriel Garcia Marquez.</p> <p>How do you feel? R2A1</p> <p>Did you find it useful?</p>	<p>24</p> <p>Motivational Quote</p> <p>Bravery does not always roar. Sometimes it's the little voice that at the end of the day tells you, "I'll try again tomorrow." Marv Anne Garcia Marquez.</p> <p>How do you feel? R3 A2</p> <p>Did you find it useful?</p>	<p>25</p> <p>Motivational Quote</p> <p>We cannot choose our emotions, but we can do with them. Fatima Savian Franco.</p> <p>How do you feel? R6 A2</p> <p>Did you find it useful?</p>	<p>26</p> <p>Motivational Quote</p> <p>Friendship doubles our joys and divides our problems. Anonymous.</p> <p>How do you feel? R9 A2</p> <p>Did you find it useful?</p>	<p>27</p> <p>Motivational Quote</p> <p>To achieve this, it is necessary to create; to create you need to believe; and to believe you need to trust. Alex Rovira</p> <p>How do you feel? Weekend message</p>	<p>28</p> <p>Motivational Quote</p> <p>Do not forget to add humour to your life to make it more colourful! Teresa Luch</p> <p>How do you feel? Last sentence R10</p>

Practical information on the app programme

Duration: 28 days

Activities: 1 activity per day from Monday to Friday (no activities on weekends).

Starting date: the programme will start on Mondays

Notifications can be programmed in the time slot of your choice.

Tiva is a character that will grow as the activities are carried out.



Frequently asked questions

If the application does not work, what should you do?

- They will contact you, if you can't solve it, contact the researcher responsible for your area.

What happens if you forget to do an activity?

- Activities can be made up the next day or you can wait until the end of the week when there are no activities to do them.

Where do the points I have earned come from?

- All activities have points. Each week, the activities become more valuable, and you get more points for doing them. In addition, if you answer the question "How do you feel" or "Was the activity useful? It also adds up to points.

Are there activities at the weekend?

- The weekend is for resting, but TIVA is still there, asking how you are doing. The weekend is a good time for you to get to know the www.cuidadorascronicos.com

Can it be that Tiva does not evolve?

- TIVA feeds on Positive Mental Health. Depending on how you respond to the activity, TIVA evolves or not.

Space for notes

