

VIVIR CON VITALIDAD-M[®]: A EUROPEAN MULTIMEDIA PROGRAMME

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During recent decades Successful Ageing has emerged as a new paradigm in Gerontology. National, European and International organizations have recommended the introduction of programs to promote active ageing. The present study examines the effectiveness of a psychosocial multimedia program called "Vivir con Vitalidad-M" (Vital Ageing-M), developed to promote Successful Ageing. A quasi-experimental pre-post with control group design was carried out, which included the application of a questionnaire on opinions, activities, physical exercise, nutrition, health, social relationships and life satisfaction. The "Vivir con Vitalidad-M" program produces behavioural changes in the expected direction in older persons attending the program. The program appears to be effective with regard to changes in life styles (diet and physical exercise), in perceptions about successful ageing and in self-efficacy for ageing, with regard to an increase in the number of physical, cultural, intellectual and social activities carried out, finally, in life-satisfaction.

En las últimas décadas el envejecimiento activo emerge como nuevo paradigma en Gerontología. Organismos nacionales, europeos e internacionales aconsejan la transmisión de conocimientos sobre la vejez y el envejecimiento a todo lo largo de la vida, y para ello recomiendan la implantación de programas que promocionen un envejecimiento competente. El presente estudio examina la eficacia de un programa psicosocial multimedia "Vivir con Vitalidad-M" dirigido a promover un envejecimiento satisfactorio, a través de la transmisión de conocimientos sobre como envejecer bien y el aprendizaje de comportamientos saludables y adaptativos. Para ello se contó con una muestra de personas mayores de 65 años a las que se les administró el programa y un grupo de control. Antes y después del tratamiento a todos los participantes se les administró una batería que mide variables relacionadas con salud y el desarrollo personal: opiniones, actividades, ejercicio físico, nutrición, salud, relaciones sociales, y satisfacción con la vida. Los results indican que el programa produce cambios en las personas mayores que pasaron por el curso multimedia en comparación con las que no lo hicieron en el sentido esperado. Esencialmente el programa parece ser eficaz por lo que respecta al cambio en los hábitos alimenticios y de ejercicio físico, en los conocimientos relativos al envejecimiento satisfactorio y la valoración de uno mismo como capaz de envejecer bien, y por lo que se refiere a la realización de un mayor número de actividades culturales, intelectuales y sociales y a la propia satisfacción con la vida.

Ageing is a populational phenomenon and an individual experience. The ageing of the population refers to the number of older groups relative to the number of younger groups. However, since neither the retirement threshold nor the limits of youth and adulthood (independence) are clearly defined in our European context, the number of people aged over 65 is usually accepted as indicating the rate of populational ageing. From this point of view, there was been an increase in the proportion of older people throughout the 20th century, so that by the beginning of the present century Europe had become the "oldest" continent in the world (EUROSTAT, 2001).

There are two basic causes of population ageing: a fall

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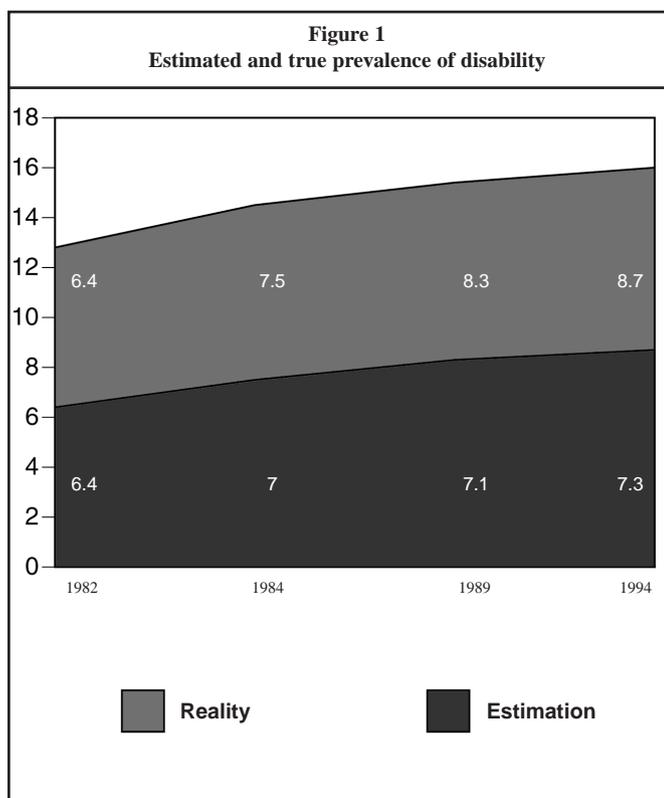
in the mortality rate (and the corresponding increase in life expectancy) and a fall in the birth rate. The 20th century basically saw a sharp reduction in mortality, essentially infant mortality, but also mortality at all ages, together with a strong decline in the number of births. Despite the fact that the ageing of any population is modulated by migratory movements, Europe has undoubtedly earned the label of "the oldest continent". Indeed, in the European Union of the Fifteen, one in four people were aged over 65, with this proportion set to increase in the future (see, for example, Díez-Nicolás & Fernández-Ballesteros, 2002).

The ageing of the population has to be considered as a positive phenomenon, as the expression of human development. Nevertheless, it undoubtedly also represents a challenge for science and society. Given that age is associated with illness, and illness with disability, the estimations in all EU countries indicate that the increase in the elderly population will lead to greater social and health costs.

An ageing population implies not only that people will live longer, but also a high probability that they will live more years with disability. Thus, a new socio-epidemiological index called Disability-Adjusted Life Expectancy (DALE) refers to a person's estimated probability at birth of living free from disability. In other words, their healthy life expectancy.

As Table 1 shows, the enormous increase in life expectancy does not ensure quality in such prolongation of

STATES	TOTAL	MALES		FEMALES	
	POPULATION AT BIRTH	AT BIRTH	AT AGE 60	AT BIRTH	AT AGE 60
AUSTRIA	71.6	68.8	15.2	74.4	18.7
BELGIUM	71.6	68.7	15.8	74.6	19.6
DENMARK	69.4	67.2	14.2	71.5	17.2
FINLAND	70.5	67.2	14.5	73.7	18.5
FRANCE	73.1	69.3	16.8	76.9	21.7
GERMANY	70.4	67.4	14.3	73.5	18.5
GREECE	72.5	70.5	16.9	74.6	18.8
ITALY	72.7	70.0	16.2	75.4	19.9
LUXEMBOURG	71.1	68.0	15.8	74.2	19.7
NORWAY	71.7	68.8	15.1	74.6	19.7
HOLLAND	72.0	69.6	15.4	74.4	19.7
PORTUGAL	69.3	65.9	14.0	72.7	17.7
SPAIN	72.8	69.8	16.8	75.7	20.1
SWEDEN	73.0	71.2	16.8	79.4	19.6
UNITED KINGDOM	71.7	69.7	15.7	73.7	18.6



life; on the contrary, it means a certain number of years of disability can be predicted. Thus, the challenge presented by the ageing of the population relates not to the proportion of older people, but to the rates of disability involved. Increasing the expectancy of life free from disability would imply reducing social cost and producing greater well-being and quality of life in citizens. But can we expect this to happen?

In short, the question is: can anything be done to increase the expectancy of life free from disability? Or, put another way: is there any empirical data at the populational level that we can influence disability rates, or healthy, active ageing? Positive results come from two types of data that we shall consider separately: predictions about disability rates at a populational level, and studies on active, successful, satisfactory or optimum ageing.

As can be seen in Figure 1, longitudinal studies show that projected disability rates have not tallied with actual rates when the future becomes the present. This epidemiological fact can be explained, according to the Federal Agency of UN (2000), by advances in preventive medicine and the promotion of health, which are gradually producing a fall in the percentage of people with disability in old age.

In sum, progress in bio-medical sciences, in education – particularly health education –, and in public policy have helped not only to increase life expectancy, but also to improve quality of life in the elderly.

FORMS OF AGEING

As we pointed out above, ageing has two dimensions: populational and individual. The first of these refers, as we have seen, to what occurs at a macrosocial level (populational calculation, number of people in a given age range, number of children per women in a given group, percentage of disabled people, etc.). The second refers to knowledge of how individuals age, or more precisely, of the changes that occur over the life span (decline in fluid intellectual functioning, changes in relation to introversion, etc.).

Thus, the individual ageing process can be reduced to a combination among patterns of growth, stability and decline. The sciences contributing to the study of ageing point to a series of characteristics of this process accepted by authors in recent years (e.g., Baltes & Baltes, 1990; Fernández-Ballesteros, 1986; 1996; Fries, 1989; Rowe & Khan, 1998):

- 1) that age is not the only determining factor of processes of development, stability and decline, but in fact interacts with socio-historical, social and personal circumstances (e.g., Lher, 1989);

- 2) that over the course of life there are differential patterns of growth, stability and decline in the set of bio-medical, psychological/behavioural and social conditions (e.g., Heckhausen and Schultz, 1993);
- 3) that there is no isomorphism between bio-medical processes and psychological and social processes – that is, psychological ageing does not show the same pattern as biological ageing; while it seems to have been shown that those psychological conditions closely linked to biological functioning (such as fluid intelligence) present a comparable decline, other psychological conditions may be stable, or may even increase (Gould, 1977);
- 4) that these patterns of change involve enormous inter-subject variability, so that there are marked individual differences on ageing. Moreover, this extraordinary variability, which is found regardless of the parameter considered, increases throughout the life cycle. Thus, for example, at the biomedical level, while there are people who age in a healthy fashion, others age pathologically (Schaie, 1996). In other words, while some individuals (in the interplay of bio-psycho-social factors) experience a relative development, a brief stability and a pronounced decline, others present patterns of extensive development, prolonged stability and scarce decline (e.g., Schroots, 1993);
- 5) that these individual developmental patterns are not at random: the individual and society can orient, promote and influence the forms of ageing (e.g., Rowe & Khan, 1998).

On the basis of these considerations, the last twenty years have seen the shaping of a new paradigm for which a series of different names have been used, including: “Healthy ageing”, “Ageing well” (e.g., Fries, 1989), “Successful ageing” (Rowe & Khan, 1998, Baltes & Baltes, 1990), “Competent ageing” (Fernández-Ballesteros, 1986, 2002a, 2002b; Schroots, 1995; Schroots, Fernández-Ballesteros & Rudinger, 1999), and “Active Ageing” (WHO, 2002).

This paradigm also has two dimensions: populational and individual. Two basic theoretical assumptions emerge from these (Fernández-Ballesteros, 2002b):

- Ageing is a process without a clear beginning, and which takes place throughout the individual’s life. It is related to genetic, biological, social and psychological conditions (Baltes & Baltes, 1990; Rowe & Khan 1997). Ageing, then, is an individual phenomenon, and the individual can do a great deal to be the agent of his or her own positive ageing.
- The environmental, economic, cultural and social conditions in a given historical context will influence

forms of ageing. As we saw in the figures for Disability-Adjusted Life Expectancy, countries with the highest socioeconomic level have the highest life expectancy and expectancy of disability-free life, due in principle to preventive and promotional health programmes (WHO, 2002; Riley et al., 1994). Thus, society and the socio-political context are actors in the process by which a population ages well, or actively.

This new perspective of successful ageing departs from a traditional, negative view. As Baltes and Baltes (1990) point out, this new paradigm goes “in search of the factors and conditions that help to identify the potential of ageing and the ways to modify (in the positive sense) ageing” (p. 4). Thus, since the 1990s, researchers have continued to examine these factors within the framework of two different models: populational and individual.

But while populational active ageing is necessarily based on social policies and programmes, individual ageing is an eminently socio-behavioral concept, starting out from the postulate that the individual is an active entity who can influence his or her own future (Bandura, 1997). Thus, we shall leave aside the question of populational ageing and focus on the concept of “successful ageing” formulated by a series of authors (Baltes & Baltes, 1990; Fries, 1989; Rowe & Khan, 1997).

Figure 2 shows Rowe and Khan’s (1997; modified) model based on longitudinal studies carried out by the McKhan Foundation, and therefore with a sound empirical basis.

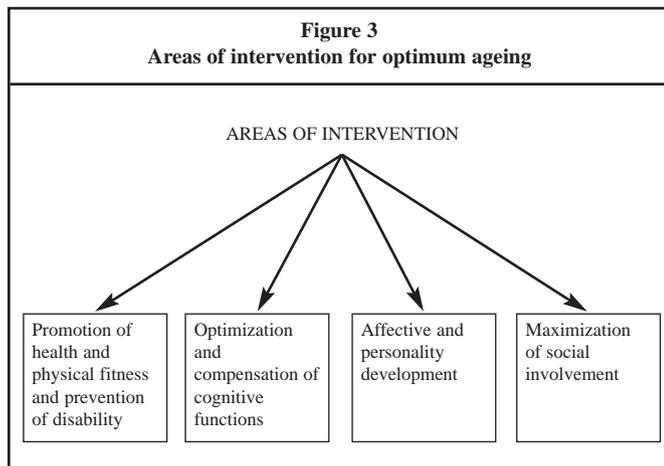
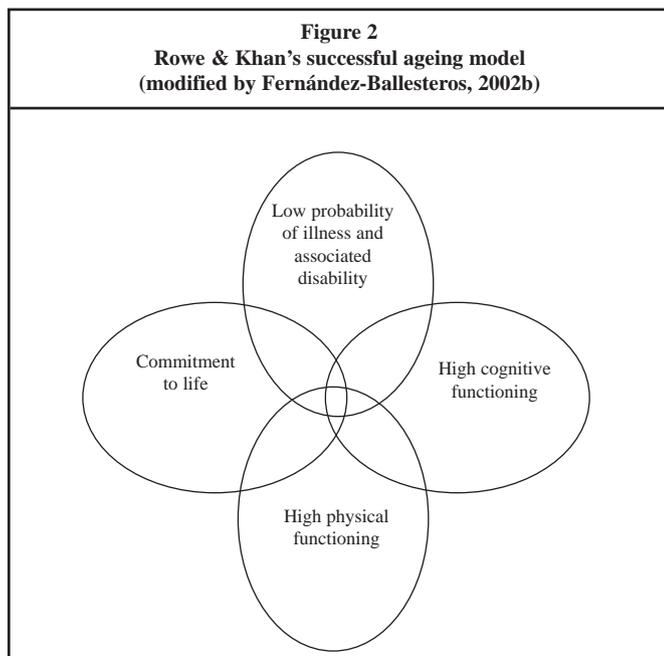
Successful ageing is operationalized by means of four groups of factors: low probability of illness and associated disability, high cognitive functioning, high physical functioning, and commitment to life. In sum, any program aimed at increasing successful ageing should attempt to prevent illness and associated disability, optimize psychological – especially cognitive – and physical functioning, and maximize commitment to life.

However, in recent years, psychological and sociobehavioral factors have been more widely dealt with as the basis of successful ageing, at both the populational and individual levels. Thus, for example, healthy life styles, coping skills, the promotion of self-efficacy and internal control, and positive thinking are psychological conditions of the personality associated with longevity and satisfactory ageing. This is also the case of other conditions related to the development of the personality, such as the acceptance of death as part of life, or the development of wisdom (WHO, 2002, Fernández-Ballesteros, 2002b). Figure 3 shows the four areas of intervention that are essential for optimum ageing.

In sum, while at a populational level it is relevant to consider socio-political measures with a view to promoting positive ageing in a given population (improving health and social security systems, increasing pensions, adapting environmental conditions, etc.), at the psychosocial level what is important is to promote in individuals those conditions that promote positive ageing. On the basis of the model presented, we shall propose the individual conditions to be promoted for the achievement of positive ageing.

THE PROMOTION OF POSITIVE AGEING

There are a series of characteristics present in most models of satisfactory or optimum ageing as *concurrent* or *critical* aspects: physical, functional, cognitive and



social. However, recent years have seen the emergence within research of affective and personality factors that appear to play an important part in optimum ageing. These would include the management of stress and coping styles in the face of conflictive situations, a belief in self-efficacy and internal control, coping with depression by means of pleasant activities, and even the acceptance of death. We can see, therefore, that a large part of the conditions that define this type of ageing, beyond the basic life styles requirements, are cognitive, affective and personality-related (internal control or self-efficacy, stress management, coping skills, positive thinking), or psychosocial (social participation, social relationships, etc.). Taking all of this into account, we must first establish whether it is possible to *manipulate* (experimentally) all of these conditions relevant to positive ageing.

Health, physical fitness, functional adequacy

One of the first authors¹ to deal with the subject of positive or optimum ageing (“ageing well”) was actually from the medical field. Fries (1989), starts out by identifying modifiable and non-modifiable biomedical conditions and factors found in the course of old age.

From this medical perspective, and based on the unequivocal observation that age strongly covaries with illness, Fries establishes the fatal and non-fatal pathological conditions most prevalent in old age. Among the fatal pathologies, cardiovascular illness and cancer are the most frequent morbimortality factors in the elderly (see Fries, 1989; WHO report, 2000). Likewise, the “non-fatal” conditions most likely to affect older people are osteo-articular and back pathologies, such as arthritis and arthrosis, and those of the endocrine systems, such as diabetes. However, the most important aspect of Fries’s work is not the list of conditions (fatal and non-fatal), but his emphasis on how to prevent them and, above all, how to promote health, that is, how to implant *behavioural protective factors*, such as so-called healthy lifestyles, that influence, even at subclinical levels (e.g., not smoking helps prevent lung cancer), the development of illnesses.

In sum, as Table 2 shows, there are a series of pathologies highly prevalent in old age with corresponding behavioural protective factors, due to their dependence on healthy lifestyles or habits. It is not necessary here to touch on the extensive area of behavioural medicine or health psychology, despite their promotional and preventive importance; what is essential here is to establish the areas in which intervention is necessary in order to promote health and prevent illness and disability.

¹ Though we should not overlook Mira y López, who, ahead of his time, wrote the work *Hacia una vejez joven* (“Towards young old age”)

Cognitive, affective, personality and social capacities

Optimum ageing, though, can certainly not be reduced to the reinforcement of health and the prevention of disability and dependence it brings with it. Rather, there are other physical, cognitive, emotional and psychosocial conditions that appear to play a crucial role in satisfactory ageing.

Several authors (Baltes & Baltes, 1990, Fries, 1989; Rowe & Khan, 1998, Ruíz Vargas, 2002; Schaie, 1990) have reported the decline in some of the parameters of cognitive functions. Thus, it is well known how fluid intelligence declines after age 30, and how some of the memory functions are affected by age. Some of these researchers have also stressed that the decline in cognitive functioning can be compensated through training. For example, Schaie and Willis (1986) showed in longitudinal studies that the decline in fluid intelligence between the ages of 60 and 80 (estimated at an average of 0.5 SD) can be offset with adequate training, with the improvement estimated at an average increase of 1 SD). Likewise, recent research has shown that deficits in working memory and episodic memory can be treated through well-proven memory programs (Wilson & Evans, 2000; Floyd & Scogin, 1997). Thus, we can conclude that cognitive functioning, in the absence of demential pathologies, can be strengthened throughout old age. Furthermore, however, it has been shown how there is a physical fitness effect, so that continued aerobic physical exercise improves brain functioning and even helps to compensate the loss of white and grey matter (Colcombe et al., 2003), and how cognitive functioning is also associated with vital capacity (see, for example, Fernández-Ballesteros, Zamarrón, Rudinger, et al., in press).

Moreover, recent research has shown the existence of other psychological factors (in addition to the cognitive ones), within the affective and personality areas, that appear to be related to optimum ageing. Thus, for example, the majority of studies support the prediction from

social-cognitive theory, that is, that control and the perception of control (or self-efficacy) is at the basis of this form of ageing (Baltes & Baltes, 1990, Rowe & Khan, 1998), and thus, also that coping styles in the management of stress or adversity permit the prevention of psychopathological conditions in old age (Lazarus, 1980, Klein & Bloom, 1997).

It is also well known that feelings of sadness and depressive conditions increase in old age, especially in those with little family support; at the same time, behavioural psychology has developed a variety of treatments for improving mood and preventing depression and sadness (e.g., Fernández-Ballesteros & López Bravo, 2002; Gallagher & Thompson, 1982; Lewinshon, 1974).

Finally, the different models of ageing appear to coincide in the fact that an essential factor in positive ageing is an intensity of social relations and competence that are expressed in greater social participation and productivity (Baltes & Baltes, 1990; Rowe & Khan, 1989, WHO, 2002). It also seems to be sufficiently well demonstrated that in the course of ageing there tends to occur a degree of “disengagement” between the individual and his or her social context, and that this has negative consequences for both the individual and society. From social and community psychology and clinical psychology, and within the framework of the social cognitive model, it has been shown which interventions can help to provide the individual with a wider social network, and to promote increased participation and social commitment.

By way of summary of the points made so far, Table 3 shows the interventions for promoting the psychological conditions (cognitive, affective/personality and social) present in positive ageing. Of course, psychological interventions can affect more than one component of positive ageing. For example, as already stated, regular physical exercise not only prevents a series of physical pathologies, but also improves the individual’s cognitive, affective and social functioning.

Table 2
Behavioural protective factors for the most frequent pathologies in old age (Fries, 1989)

Illness	Diet	Physical Exercise	Smoking	Excessive drinking	Obesity	Blood pressure check
Arteriosclerosis	X	X	X		X	X
Cancer	X		X	X	X	
Emphysema			X			
Diabetes	X	X			X	
Osteoarthritis		X		X		
Back problems		X				

“VIVIR CON VITALIDAD-M®” (VITAL AGEING)

On the basis of all the empirical evidence mentioned, over the last six years, Fernández-Ballesteros has developed a program for promoting positive ageing (alternatively: active, successful, competent, satisfactory or optimum ageing): “Vivir con Vitalidad”. The program, designed to be imparted as a course by experts in the different areas involved, has been presented in 7 consecutive editions at the Autónoma University of Madrid (Spain), and has also been published as a text for self-administration (Fernández-Ballesteros, 2002a).

More recently, Vivir con Vitalidad has been developed as the multimedia program “Vital Ageing or Vivir con Vitalidad-M”®, under the auspices of the EU Socrates-Minerva Program with the collaboration of the Consortium comprising NETTUNO (Italy), the Autónoma University of Madrid (Spain) and the Gerontology Institute of the University of Heidelberg (Germany), and in partnership with the Open University (United Kingdom).

The video-course consists of 50 hours and 22 topics taught by Spanish, Italian and German lecturers.

Table 4 shows the topics covered and the teachers that have taught the course.

As it can be seen, the topics dealt with cover the four general areas presented in Figure 3.

Thus, the *PROMOTION OF HEALTH AND PHYSICAL FITNESS AND PREVENTION OF PHYSICAL DISABILITY* is covered through the following topics:

- Ageing well.
- Enjoying taking care of yourself
- Nutrition and health
- Taking care of your body.
- Regular exercise: the best lifestyle

COGNITIVE OPTIMIZATION AND COMPENSATION

is dealt with through:

- Train your mind: how to prevent brain ageing.
- Improve your memory
- Become an expert in your memory problems.
- The creative age.
- Wisdom and lifelong learning.

DEVELOPMENT OF AFFECTIVITY AND PERSONALITY is dealt with in the following units:

- Feel-efficacy.
- Positive thinking.
- Pleasant activities and well-being.
- Coping with stress.
- Self-responsibility and self-management.
- Death is also part of life.

MAXIMIZATION OF SOCIAL INVOLVEMENT is accounted for by the following lectures:

- Sexuality: beyond genitality.
- Improving relationships with family and friends.
- Others need me too.
- Internet: another communication system.

This program has the following objectives:

General objective

- To promote well-being and quality of life in people aged over 60.

Specific objectives

- To transmit basic knowledge about how to age actively and competently.
- To promote healthy lifestyles.
- To train strategies for optimizing competencies: cognitive, affective and emotional, motivational and social.
- To train in strategies for compensating some types of functional decline.
- To promote personal development and social participation throughout the life cycle.
- To promote the use of new technologies.

In sum, on the basis of the theoretical and empirical perspectives of the successful (or competent, optimum or active) ageing paradigm, this course was elaborated, in parallel to “Vivir con Vitalidad” (Fernández-Ballesteros, 2002a), in video units with computer resources that can be found at: www.uninettuno.it/Vitalagell/frameset.htm.

We shall now present its experimental assessment.

EVALUATION OF “VIVIR CON VITALIDAD-M”

The “Vivir con Vitalidad-M” program has a series of different objectives, so that there is a general prediction

Table 3
Interventions for promoting the psychological components of positive ageing

INTERVENTIONS	Physical exercise	Cognitive training	Memory training	Stress management	Control management	Increase of activity	Social skills
Intellectual competence	X	X	X	X		X	
Memory skills	X	X	X				
Control			X	X	X	X	X
Coping styles					X	X	
Physical capacity	X						
Social participation	X		X	X	X	X	X

that it will produce changes in diverse socio-behavioural and psychological conditions in those who follow the course. We carried out a formative and summative evaluation study to assess the program through a quasi-experimental pre-posttest with control group design. Below we present the assessment method used in this study and the results obtained.

METHOD

Participants

Participants were 88 people aged over 60, divided in three groups:

- **Residence (N = 13):** Thirteen volunteers living in a residence for the elderly run by the Madrid Autonomous Region (*Comunidad Autónoma de Madrid, CAM*). This residence is sufficiently representative of the population of elderly living in public residences in the CAM. Participants volunteered after an Information Session about the program.
- **Community (N = 44):** People attending a Senior Centre run by the CAM. This centre was selected by the regional authority itself by virtue of its heterogeneity and its representativeness with respect to the rest of the CAM Senior Centres.
- **Control group (N = 31).** Made up of elderly people attending the Senior Centre and who participated in

other activities, but did not follow the video- course program.

Table 5 shows the following information: Age (mean and standard deviation in brackets) and number of participants and associated percentage by category for the following variables: Sex, Marital Status (Single [1], Married [2], Widow/Widower [3] and Divorced/Separated [4]), and Educational Level (Illiterate [1], Not completed basic education [2], Elementary certificate [3], High School certificate [4], Technical education [5], University studies [6]).

Variables

From the assessment instruments applied during the program, in the present work we shall provide the results of the questionnaires used during the summative evaluation of the program.

- **QUESTIONNAIRE ON ACTIVITIES (18 items):** Includes questions on the frequency during the past month of a variety of activities, such as doing domestic chores, attending shows or cinemas, or participating in games. Responses are made on a scale of four options: Not at all (1), Fairly infrequently (2), Fairly frequently (3) Very frequently (4). The reliability (alpha) coefficients obtained in the pre and post phases (.68 and .67, respectively) are satisfactory. The

Table 4
VIVIR CON VITALIDAD-M: List of topics covered, teacher, country

UNIT	HOURS	Topics	Teacher	Country
1	2	Vivir con Vitalidad: Presentation	Prof. R. Fernández-Ballesteros	Spain
2	2	Ageing well	Prof. R. Fernández-Ballesteros	Spain
3	2	INTERNET: A new communication system	Prof. P. Adarraga	Spain
4	2	Feeling feel-efficacy	Prof. R. Fernández-Ballesteros	Spain
5	2	Self-responsibility and self-management	Prof. A. Kruse	Germany
6	2	Enjoy take care of yourself	Prof. E. G ^a Huete	Spain
7	3	Nutrition and health:	Profs. P.A. Migliaccio and A. D'Ámicis	Italy
8	4	Regular exercise: the best lifestyle	Prof. R. Ortíz	Spain
9	2	Positive thinking	Dra. M.D. Zamarrón	Spain
10	2	Taking care of your body	Prof. A. Drusini	Italy
11	2	Pleasant activities and well-being	Prof. R. Fernández-Ballesteros	Spain
12	2	Coping with stress	Prof. E. G ^a Huete	Spain
13	2	Become an expert in your memory problems	Prof. R. Kliegl	Germany
14	3	Improve your memory	Prof. J.M. Ruiz Vargas	Spain
15	2	The creative age	Prof. M. Cesa-Bianchi	Italy
16	3	Sexuality: beyond genitality	Dr. A. Martínez Calero	Spain
17	2	Improve relationships with family and friends	Prof. A.S. Bombi	Italy
18	2	Others need me too	Prof. G.V. Caprara	Italy
19	2	Train your mind: how to prevent brain ageing	Prof. A. Kruse	Germany
20	2	Death is also part of life	Prof. P. Barreto	Spain
21	2	Wisdom and lifelong learning	Prof. U. Kunzmann	Germany.
22	2	Summary, Conclusions and Assessment	Prof. R. Fernández-Ballesteros	Spain
	50			

raw score obtained is the sum of all the items divided by the number of items with a response. This weighting was necessary due to the interpersonal differences in number of items answered.

- QUESTIONNAIRE ON OPINIONS (19 items). Includes questions about personal opinions on diverse topics, such as ageing, health, social activities or death. Response format is also a four-option scale: Not at all (1), To some extent (2), Quite a lot (3) and A lot (4). The reliability (alpha) coefficients are also quite satisfactory (.79 and .77, for pre and post, respectively). The raw score obtained is the sum of all the items divided by the number of items with a response. This weighting was necessary due to the interpersonal differences in number of items answered.
- PHYSICAL EXERCISE (1 item). The protocol administered includes one question on the amount of exercise done. The response format has five options, from total lack of exercise (1) to regular intense exercise, more than three days a week (5). This variable was not used for the Residence group, since all the members carried out the same physical activities, organi-

zed by the residence itself.

- DIET (9 items): The score on diet has two components: 1) Control over diet (salt, sugar and water), with a dichotomic response scale: Control (1), No control (0); and 2) Six questions on quality of diet (number and composition of meals), with a response scale of 1-3. Total score is the sum of the two previous components. Minimum score is 6, and maximum, 21.
- HEALTH. From this questionnaire we extracted the variable "Number of health problems" from 12 questions on specific complaints (heart problems, rheumatism, headaches, etc.). Each affirmative response scored one point. Total score is the sum of health problems.
- SOCIAL RELATIONSHIPS. This scale reflects two measures: 1) Frequency of social relationships (with family, friends and neighbours), Less than once a month (1), Every month (2), Fortnightly (3), Weekly (4), and Several times a week (5); and 2) Expressed satisfaction with these relationships: None (1), Some (2), Quite a lot (3), A lot (4), and Very high satisfaction (5). In both cases the score is the raw sum of the responses.
- SATISFACTION WITH LIFE. As was the case of Physical Exercise, this variable has just one item: "Taking into account the good and the bad of life, how satisfied are you at the present time?": Not at all (1), To some extent (2), Quite satisfied (3), Very satisfied (4).

Table 5
Number of people and associated percentage in the three groups compared

Variable	Categories	GROUPS				
		Residence	Community	Control		
Age	Means	79,3 (7,6)	69,9 (6)	74,2 (6,8)		
Sex	Man	N	1	7	7	
		%	7.7	16.3	22.6	
	Woman	N	12	36	24	
		%	92.3	83.7	77.4	
	Single	N	0	14	13	
		%	0	32.6	43.3	
Married	N	4	4	8		
	%	33.3	9.3	26.7		
Marital status	Widow/Widower	N	5	18	9	
		%	41.7	41.9	30.0	
	Divorced/Separated	N	3	7	0	
		%	25.0	16.3	0	
Educational level	Illiterate	N	0	0	1	
		%	0	0	3.6	
	Not completed basic education	N	7	7	6	
		%	53.8	17.9	21.4	
	Elementary certificate	N	2	8	9	
		%	15.4	20.5	32.1	
	High School certificate	N	3	10	4	
		%	23.1	25.6	14.3	
	Technical education	University studies	N	1	7	0
			%	7.7	17.9	0
University studies		N	0	7	8	
		%	0	17.9	28.6	

Program and Procedure

"Vivir con Vitalidad-M" comprises 50 hours of video-lessons, with 22 topics, the majority of which are taught in two sessions of 40 minutes each (see Table 5), with a break of 15 minutes in each session. Thus, the presentation of each unit takes around 2 hours.

The multimedia program includes the presentation of the *material*, the *exercises* or *tests* proposed in the units, and the *transparencies* used in Internet: (www.uninettuno.it/vitalagell/frameset.htm). Students have the possibility of talking to tutors on the telephone or via e-mail.

In both experimental groups (Residence and Community), the video-course was administered by trained tutors² who administered the evaluation instruments, connected the video, TV and all other necessary equipment. They were instructed not to reply to questions about the lessons, so that viewing of the videos would be as close as possible to standard (through satellite) for all participants.

² We should like to express our sincere gratitude to Marta Del Olmo, Gema Pérez Rojo and Carmen Yolanda Fernández Corbeira for all their excellent work on this part of the program.

Statistical analysis

In order to address the objectives of the video-course through a pre-posttest with control group design, the following analyses were carried out:

- 1) **Equivalence of the groups.** In a first step we confirmed the existence of differences between the groups in sociodemographic variables. The statistical tests used vary depending on the nature of the variables analyzed:
 - i. *Sex*: Contingency table.
 - ii. *Age, Marital status and Educational level*: One-factor ANOVA followed by post-hoc comparisons using the Tukey method. Given the fact that the variables Marital Status and Educational Level can be considered nominal or ordinal, a non-parametric test is necessary to confirm the results of the ANOVA. With more than two independent samples involved, the selected test is that of Kruskal-Wallis.
- 2) **Summative evaluation.** The analyses were carried out separately for each group, since the interest lay in observing the different pattern of results. We compared the means obtained before and after the program in each group using a repeated-measures T test. We also compared the post-test means of the two experimental groups with that of the control group.

RESULTS

A) Equivalence of the groups

- 1) *Sex*. No differences were found between groups in percentages of each sex. Corrected standard residuals are less than 121. It should be noted that there were more women in all three groups, as occurs in the general population for this age group.
- 2) *Age, Educational Level and Marital Status*. The ANOVA results show significant differences in age ($F = 11.3$; $p = .000$) and Educational level ($F = 5.48$; $p = 0.06$), but not in Marital status ($F = 3.06$; $p = 0.53$). Nevertheless, the Kruskal-Wallis test does indeed show significant differences in the latter two variables ($p = 0.008$ and $p = 0.45$, respectively). The Residence group is older (a mean of 79.3 years) than the other two groups, and has a higher proportion of widows/widowers and divorced/separated people (and a lower proportion of singles) among its members than the control group; also, its educational level is lower than that reported by those in the Community group. It should be stressed that the essential differences due to the greater mean age in the Residence group are due to the usual conditions of Residences (normally run by public authorities). As regards comparisons bet-

ween the Community and control groups, significant differences only emerge for the variable age, the means being 69.9 and 74.2 years, respectively.

- 3) **Comparisons between pre control and pre experimental (Community).** For comparisons between the Community and Control groups ($\alpha = 0.05$) no significant differences were found between the two before the program, except in the variable "Diet", in favour of the Community group, which eats more healthily than the Controls. Significant differences did emerge in the variables "Satisfaction with life" and "Physical Exercise" between the Control group and the Community group before the program. However, as we shall see below, these differences are inverted after the program.

B) Pretest-posttest differences

Table 6 shows the means for pretest and posttest by type of Questionnaire and by Group, the number of participants and the significance level of the comparison of means (based on a repeated-measures T test). It can be seen that the number of participants shown is smaller than the total number of participants. This is due to the fact that only those who had responded to both the pre and post questionnaires were included.

In general, the results show a clear effect of the program on the behavioural indicators assessed. Comparison of the *pre and posttest measures* in the experimental groups reveals changes in the following variables: 1) Opinions about themselves and about ageing. To a significant extent, those who took part in the program have a better view of ageing, consider themselves more effective for dealing with old age, and give opinions about themselves in accordance with what was presented in the program units; 2) Likewise, they more frequently enjoy cultural, intellectual, affective and social activities than they did before the course; 3) The Community group does more physical exercise, though the Residence does not change in this variable, which is understandable, given that their exercise regime is established collectively by the residence; 4) The Community group significantly improves its diet, though this is not the case for the Residence group, undoubtedly because of their lack of control over this variable; 5) The Community group also shows an improvement in their Satisfaction with life; 6) No significant differences were found for either of the experimental groups in Health or Social Relationships (neither in frequency nor in satisfaction).

C) Experimental-Control posttest comparisons

With the aim of highlighting the differences between the experimental and control groups at the posttest level for the variables studied, it is necessary to make posttest comparisons between the groups. We therefore carried out a one-factor ANOVA with three levels

Table 6
Comparison of means pre-post by questionnaire and group

Questionnaire	Group	Condition	N	Means	Standard Deviations	p(*)
ACTIVITIES	Residence	Pre	10	2.26	.38	.048
		Post		2.53	.36	
	Community	Pre	34	2.42	.43	.009
		Post		2.58	.41	
	Control	Pre	29	2.3	6.48	.440
		Post		2.29	.35	
OPINIONS	Residence	Pre	10	2.79	.51	.008
		Post		3.16	.48	
	Community	Pre	33	2.90	.39	.001
		Post		3.05	.35	
	Control	Pre	29	2.87	.35	.147
		Post		2.79	.37	
PHYSICAL EXERCISE	Residence	Pre	10	5.70	.95	1.00
		Post		5.70	.95	
	Community	Pre	36	2.53	.81	.000
		Post		3.11	.95	
	Control	Pre	25	2.72	1.21	.295
		Post		3	1.19	
DIET	Residence	Pre	10	10.4	2.17	.662
		Post		10.8	2.04	
	Community	Pre	34	12.03	2.24	.040
		Post		12.82	2.60	
	Control	Pre	29	10.76	2.6	.861
		Post		10.83	2.45	
HEALTH PROBLEMS	Residence	Pre	10	3.6	1.78	.840
		Post		3.7	1.34	
	Community	Pre	34	3.32	1.65	.242
		Post		3.53	1.73	
	Control	Pre	28	3.29	2.03	.836
		Post		3.36	1.68	
SOCIAL RELATIONSHIPS (FREQUENCY)	Residence	Pre	10	10.3	2.45	.594
		Post		9.6	4.09	
	Community	Pre	29	9.69	3.13	.389
		Post		10.31	3.79	
	Control	Pre	26	10.62	3.70	.426
		Post		11.19	3.41	
SOCIAL RELATIONSHIPS (SATISFACTION)	Residence	Pre	10	9	2.79	.631
		Post		9.4	2.37	
	Community	Pre	31	10.26	2.86	.307
		Post		9.77	2.58	
	Control	Pre	26	10.27	2.74	.950
		Post		10.23	2.18	
SATISFACTION WITH LIFE	Residence	Pre	10	3	.67	.168
		Post		3.2	.63	
	Community	Pre	31	2.9	.65	.005
		Post		3.19	.79	
	Control	Pre	27	3.15	.53	1.00
		Post		3.15	.72	

(*) Probabilities lower than .05 reflect significant changes between the two conditions (pre and post)

(corresponding to the three groups analyzed) and one dependent variable (post-hoc comparisons made by means of the Tukey method). For the Activities questionnaire, significant differences were found between the Community and Control groups ($p = 0.01$), whilst for the Opinions questionnaire the means of the Control group were lower than those of the Residence ($p = 0.023$) and Community ($p = 0.02$) groups. Differences were also found between the Community and control groups for the variable Diet, in favour of the former ($p = 0.006$). Although the differences in this third variable were already significant in the pre phase, the program had the effect of increasing these differences, as highlighted by the significant pre-post changes for the Community group. When the effect of age is controlled, the differences between the Community and Control groups continue to be significant in the three variables. The Community group also shows significant differences in their Satisfaction with life. In the remainder of the variables studied in the course of the summative evaluation there were no differences between the three groups. There were no significant changes in the control group in any of the variables.

Two possible reasons can be adduced for this pattern of results: 1) Differences between the groups in the pre phase, and 2) A response bias in the post questionnaires. The almost total absence of significant differences with respect to the Control group in the pre phase would lead us to reject the first hypothesis. As regards the second, there are two reasons for rejecting it: a) the high reliabilities of the Activities and Opinions questionnaires in the posttest; and b) Bearing in mind that the program did not include specific medical care, and that its duration was relatively short, we did not expect to find a substantial improvement in health problems, as occurs in health promotion programs. Nor was it plausible to imagine that social contacts had increased substantially. This may be due to the fact that a large majority of participants already had healthy lifestyles (ceiling effect), so that any changes that might occur were not observable straight after the end of the course.

In summary, the “Vivir con Vitalidad” multimedia program succeeded in improving a series of opinions on oneself and ageing, increasing the frequency of activities in the expected direction, improving participants’ diet, and raising their levels of physical exercise and life satisfaction. These changes were especially notable in the Community group; in the Residence group, with fewer participants and a higher mean age, the improvements were less important.

CONCLUSIONS

The "Vivir con Vitalidad-M" program produces behavioural changes in elderly people in the expected direction. Essentially, the program has the effect of increasing the frequency of participants' cultural, intellectual and social activities and improving their capacity for seeing themselves as a person capable of ageing well, as well as increasing the quality of their diet and their control over it. This last result is of great relevance, as it indicates an impact on behaviours (even though the information is from self-reports) directly related to the promotion of health, one of the fundamental objectives of optimum ageing programs.

These changes occur both in the group living in the community and in those living in public residences.

The improvements found in the Residence group are more striking if we bear in mind the greater mean age of these participants and the less control they have, given the institutionalized and highly regulated nature of their environment. Considering both of these factors, it is logical that their greatest changes should refer to the Opinions questionnaire, since their capacity for increasing the number and frequency of activities is reduced for these reasons.

The objectives of the program are to improve a series of areas related to optimum ageing. The program achieves changes at a general level, though we might ask ourselves whether these changes are circumscribed to a particular area of intervention, or whether they have an effect on the four intervention areas of optimum ageing. According to the improvements observed in the percentage of people responding to certain items in the expected categories, it can be confirmed that the program would influence the four intervention areas essential to optimum ageing. Thus, the increase in activities would involve an improvement in health (e.g., more than 15% of participants report substantial changes in the frequency with which they take walks, and around 20% look after themselves considerably more than they did before the program), cognitive optimization and compensation (e.g., 15% of the sample perceive themselves as more capable of solving problems, and over 20% no longer associate old age with inevitable general dysfunctions of memory), affective and personality development (e.g., more than 15% of people who took part in the program have reduced their fear of death and the anxiety produced by its proximity) and, finally, maximization of social involvement (around 15% of participants have decided to devote more time supporting others, and now see sexual relations in a more positive).

Moreover, an indicator of improvement in the four areas would be the predisposition of those who took part

in the program to deal with administrative matters: more than 20% in the Community group went from doing "Nothing" or "A little" to dealing with "Quite a lot" or "A lot" of such matters during the period of the program (11% in the Residence group). This increase could be due to demands from the Senior Centre itself or to the period in which the program was applied, though we should point out that in the Control group not only did this percentage not increase, but it actually fell by 2%.

Significant changes are also appreciated in relation to lifestyles in the Community group. Thus, physical exercise increases and diet becomes more varied. Such changes do not occur in the Residence group.

The program also appears to have increased significantly the life satisfaction of those participants living in the community (again, this was not the case for those in the Residence group). As a post-hoc explanation it can be adduced that those in residences have much less control over their environment than those living in the community, and that, in this particular case and in Spain in general, the former are much older than the latter. For both of these reasons we would expect less impact of the program on those living in Residences than in the Community.

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