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Pilot Results: Basal and Final Evaluation of End Users

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Short Abstract

The deliverable D7.4 (Pilot Results: Basal and Final Evaluation of End Users) is the result of task 7.4 "Pilot Study" activities. At the beginning of the study was intended to describe the pilot study results of the NESTORE system and its specific components, including a description of the preliminary results obtained during piloting. Nevertheless, the disruption of the COVID-19 pandemic has disrupted the initial planning of the study, freezing its development in the sites where the recruitment begun and delaying the onset in the others.

Key Words

Pilot study and recruitment, baseline assessment

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1. Introduction

The deliverable D7.4 (Pilot Results: Basal and Final Evaluation of End Users) is the result of task 7.4 "Pilot Study" activities. At the beginning of the study it was intended to describe the pilot study results of the NESTORE system and its specific components, including a description of the preliminary results obtained during piloting. Nevertheless, the disruption of the COVID-19 pandemic has affected the initial planning of the study. The pandemic outbreak and the restrictions imposed by the different states lead to the freezing of the study in Barcelona and Milan, where some participants already did all or part of the initial assessments, and the delay of the study in Rotterdam. Such events have had a negative toll over the recruitment: much of the potential participants contacted before the outbreak changed their initial will to participate in the study and could not be fully replaced, leading to a lower number of participants than those previously expected. Furthermore, in Italy and The Netherlands the data was gathered in paper, and it existed a delay in the introduction of data in the database. For these reasons, the scope and goal of this report has been modified to show the initial characteristics of the participants available up to 21 December 2020, having in mind that the data of both groups are incomplete, with an imbalance in the introduction of the data that affects comparability of the groups with a high risk of spurious results at the current stage. In the next deliverable D7.5. Report on pilot results Validation phase, it will be provided the complete data analysis collected in baseline and final assessments.

1.1 The NESTORE System

The ultimate objective of NESTORE is to facilitate the maintenance of functional health (defined as the ability to perform activities of daily life) and wellbeing levels during later life. To reach this goal, NESTORE will develop an innovative, multi-dimensional, personalized coaching system to support healthy ageing by:

- Generating and sustaining motivation to take care of one's own health;
- Providing targeted suggestions in the areas of healthy nutrition, physical activity and physiological functioning, social integration and cognitive functioning, with the ultimate goal in the long run to prevent functional decline and preserve wellbeing.

> NESTORE is a technology platform intended to gather information about lifestyle habits, behavior, beliefs and preferences and provide tailored advice to ultimately increase healthy-life, wellbeing and disability-free life expectancy, delaying or preventing the onset of disability and loss of autonomy.

NESTORE is based on an input system that collects and registers information from the user based in automatic method (sensors) and self-reporting (questionnaires) which allows, through several algorithms, to offer personalized advice on life habits and healthy behaviours according to the different well-being domains and related pathways that each person can choose among those that are offered in the four NESTORE domains: Physical activity, nutrition, cognitive functioning, and social behaviour.

1.2 Relation with other workpackages

This deliverable uses the outputs created in WP 2, deliverable 2.1 "Models for healthy older people", where the domain experts defined the variables necessary to assess user status and intervention outcomes, and deliverable 2.6 "Validation plan. It will be also used into task 7.5 "Pilot Results: Validation Phase"; task 7.6 "Pilot Results: Usability and Applicability of the System"; and task 7.7 "Pilot Results: Impact on End-Users' Lifestyle". But there are other relationships between WP and tasks that are summarized in Fig.1 WP7 Diagram.

Figure 1. WP7 diagram relationships between tasks.
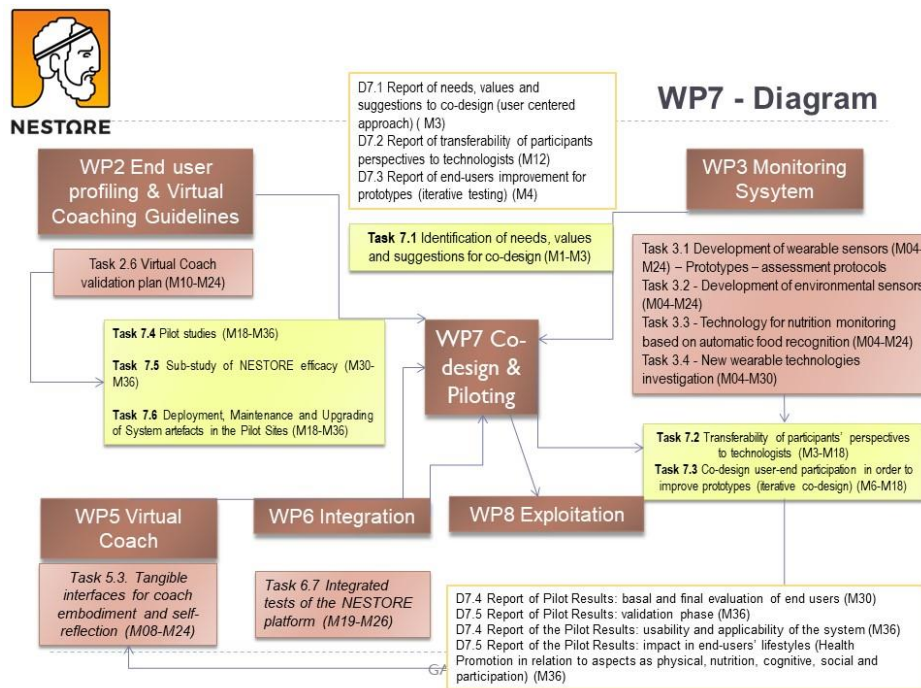
2. Study Design

2.1 Population

The volunteers required for the pilot study were defined as older people between 65 and 75 years old (both included), community dwelling, living in their own homes and Android Smartphone and high-speed connexion at home. It was also an eligibility criterion to include those individuals that were cognitively, physically, and mentally healthy enough to be able to use the technical system. At the same time, the system and its interventions were developed having healthy older adults in mind, in terms of highly functioning older individuals without certain conditions that could require physician control and counselling. Thus, all chronic diseases (cardiovascular, metabolic, neurologic, immunologic) needed to be an exclusion criterion. Only persons with certain controlled chronic conditions could be included, as they could benefit from the NESTORE Platform (e.g., individuals with hypertension, hypercholesterolemia, hypertriglyceridemia and type 2 diabetes could benefit from nutrition-based interventions, individuals with hypertension could benefit from aerobic exercises, etc.) or NESTORE Platform could at least inform them where to turn to help manage their conditions (e.g., individuals with minor and frequent conditions like constipation could profit from modified nutritional habits).

2.2 Intervention

The NESTORE pilot has been designed with one intervention and one control group, with an effective length of 12 weeks. The description of the interventions, including their rationale and evidence base, can be found in deliverable 2.2 "Guidelines for the Virtual Coach in all the Target Domains". In short, persons in the intervention group use the NESTORE system, which do an assessment of physical, nutritional, social and mental domains through several sensors and the direct input of the participants, who sets his/her preferences and goals. After the initial period of assessment NESTORE systems provides tailored advice to keep a healthy lifestyle and maintain or improve the aforementioned domains. Persons in the control group receive printed materials with general advices to keep a healthy lifestyle.

NESTORE was developed as a person-centered design, which means that participants are involved from the beginning to the end in all the phases. This philosophy requires their active participation, especially in the preparation of informed consent. This step can be understood not only as the road map but also the compass, because it gives crucial information about how the study will be and the direction that the research team will maintain to protect participants' rights during the study. The process of preparation included the active involvement of stakeholders (FAS members), a selected older people group (who improved the document highlighting the aspects that were more concerned about). Several phases were developed to review and improve the final document in terms of readability. One of the elements that participants valued was to know that several universities were aligned to submit the study in three ethical committees.

2.3 Sample size and allocation.

The study has been planned to have 90 participants (30 control, 60 intervention). Each participant should be randomized to each arm after the first assessment using computer generation random numbers.

2.4 COVID-19 impact.

COVID-19 outbreak and its contingency measures have had a big impact in the development of the study as was planned. Such impact has been different at each site according to the stage of the pilot study at the moment of the onset of the outbreak and restrictions that have been adopted at each country. In overall, the number of participants finally enrolled has been reduced, the schedule of the study has been modified or delayed, a relevant proportion of participants have shortened their effective participation to less than the 12 weeks initially expected and some recommendations no longer could be performed due to government restrictions. The above circumstances have spoiled the initial objectives to do an exploratory assessment of the impact of the interventions in well-being, autonomy and maintenance or improvement in the levels of the aforementioned domains, although have retained the ability to detect problems that could happen often.

In Barcelona were randomized the 24 first participants. Due to the outbreak, the consecution of the required sample was jeopardized, so in order to achieve the initial sample some candidates who did not met technological criteria were allocated to the control group.

3. RESULTS

3.1 Recruitment and results

3.1.1 Recruitment strategy

Even though pilot site institutions have different missions and aims, the recruitment strategies across the three pilot sites had similarities. However, the recruitment sources were significantly different depending on their nature and activities of each institution. Each of the recruitment strategies have been documented by pilot sites, aiming for at least partial comparability in recruitment strategies.

Precisely, due to the current work of the three institutions it was developed a triple strategy for the recruitment: using their own institutions records (in the case of FSIE it was used the volunteers' research database that provides candidates for the research projects), to perform an active search of new volunteers using alliances with seniors' organizations, centres, third age institutions and associations (as in the case of Rotterdam and Barcelona, but also FSIE contacted with cultural and seniors' centres and NGO), and finally the use of social media to recruit people interested in technologies and with digital skills (as in the case of La Meridiana). The strategy was set in three steps (to inform, to answer and to recruit). In each phase the provided information was mediated by the moment and the information that candidates needed.

In terms of incentives, there was two approaches: the use of material incentives (monetary as in the case of Rotterdam) or immaterial. The second one refers to the opportunity of the volunteers to express themselves, the chance of addressing personal concerns not directly related to the study's purpose (participatory incentive), to enjoy company (social incentive) and to be offered feedback on the results of the assessments (informational incentive). The volunteers in this project were also very interested in knowing the results of some of the performed tests or to know the global results.

The focus of the three pilot sites was based on the immaterial approach, because only the Rotterdam site could offer an economic incentive to participants due to the fact that their ethical committee did not limit compensation in kind. But in Monza and Barcelona, it was not possible to offer monetary incentives. But the fact of contributing to something that volunteers knew that would be beneficial for others in the future, had a great influence in their recruitment and retention. The participants stated on several occasions that the main driving force behind their engagement was the knowledge that the results obtained with their participation would help to improve the NESTORE system, which, in turn, could help many people of their age in the future. This altruistic act gave them an individual resignification and also the incentive of social interaction. Not only with the research team, but also with the rest of the participants, taking part in the presential meetings (in the case of the Barcelona pilot site) and/or with the family members and friends that would also take part in the study (because of the social beacons). Precisely, in the Barcelona site, the organisation of three meetings before starting the field work turned out to be a good, helpful and valued by participants. Although these meetings were addressed to review and solve doubts about the informed consent, to explain in more detail the project chronogram, to solve questions and to display the devices on site, they had an unexpected and positive output for this experience. These encounters worked as a merging experience that helped participants to feel part of a group and to share similar ideas. They met a space where to feel free to express their concerns about the project and expectations.

Finally, as mentioned before, there was an incentive for all participants that was to be informed about research results by the end of the study.

3.1.1.1 Barcelona pilot site strategy

Fundació Salut i Envelliment UAB (FSIE) is an expert centre in the field of ageing and health in Barcelona (Spain). The Foundation performs research on all aspects of health and aging, both clinical and social, with a long history of research among others on dementia (including mild cognitive impairment and Alzheimer's disease), physical activity, falls, frailty, nutrition, disability assessment, as well as assistive technologies for the elderly. The FSiE has advised the Catalan government on issues related to the care of older adults and especially those with chronic diseases. It also has frequent contact with patients, caregivers and older people associations, as well as nursing homes, long term care centres, etc. It has also experience in performing focus groups for qualitative and quantitative studies. FSIE has carried out several projects working together with the national and regional governments as well with other foundations and companies. The Foundation has also carried out numerous studies centred in patient's views in self-care and healthcare, patients' rights, as well as the active patient model or patients' information needs concerning health and management of illness and health literacy.

FSIE's strategy was based on institutional and individual contacts by phone or email and collective presential or online dissemination activities. The first contacts were made through other entities and thanks to the collaboration of several gatekeepers working there. A total of 21 places were visited: senior citizens' centres (both day-care and leisure centres), cultural centres in different neighbourhoods, associations or foundations working for and with the seniors and homes with autonomy flats for the older people. But above all, in Barcelona, most of the interested people were particularly engaged through third age universities that offer language or general culture lessons for seniors.

The phone and email contacts were initially considered as an important moment where the content needed to be carefully selected. Because of this, a topic guide with the main aspects to be informed was prepared. Regarding the face-to-face dissemination activities, a power-point presentation and a leaflet were used to illustrate the basic statements of the project (background, aims, chronology and the inclusion and exclusion criteria concisely). The online campaign was based on the location of a banner in FSIE's website and social media profiles. A press release was also launched and other social channels such as Twitter and LinkedIn were used to do short communications.

In conclusion, from FSIE's experience, the most effective and operational way to recruit during this study was using the volunteers' research database and the face-to-face meetings mediated by the figure of NESTORE ambassadors (representatives and gatekeepers from different third age associations as the "Associació de Temps Lliure", "ASECOT" and "Associació de Jubilats i Pensionistes de Ripollet", etc.) who were committed to diffuse and help in the recruitment. This model was very effective, firstly, because it was based on the trust and knowledge construction, and secondly, because the meetings created the conditions to generate the adequate environment to facilitate candidates' questions and solve doubts, but also to let research volunteers to identify and know the research team before settling the first trust steps.

3.1.1.2 Monza pilot site strategy

La Meridiana's strategy was based on intensive use of social media, the organization of group meetings and phone calls. Through the contact with facilities users' relatives, they had the opportunity to generate a volunteers' pool to be asked to join the study.

3.1.1.3 Rotterdam *pilot site strategy*

The Nestore project's recruitment in Rotterdam was done with the assistance of two senior organizations within Schiedam (a city next to Rotterdam): Seniorenwelzijn and Soos Blauwhuis. Seniorenwelzijn has multiple senior meeting centres in which recruitment took place. Soos Blauwhuis has one centre, which in the pilot study formed the heart of the recruitment and assessments. Seniors from these meeting centres already participated in the previous co-design sessions of NESTORE, which led to the development and design of the different components within the NESTORE Platform. Their main motivation to participate in these sessions was because of an interest

in technology, but also their motivation to help us with developing technology that is suitable for (Dutch) older adults. The older adults visiting these centres are mainly healthy, independent community-dwelling older adults. Important to note is that participants from the co-design sessions were not included in the pilot study as they were not blank in their experiences and knowledge because they had seen and used prior forms of the NESTORE platform.

In the recruiting phase, face-to-face meetings with (groups of) seniors was proven to be the most effective strategy. During a period of half a year, many smaller and larger scale meetings were organized by the researchers, mostly linked to pre-existing gatherings. So, the seniors were informed about NESTORE within their usual social group settings. Next to that, many local television and radio performances contributed to achieving more publicity and awareness regarding NESTORE, as did online (social) media and offline newspapers. In the end, nearly all participants who remained in the study were recruited by means of face-to-face contact from a social gathering in a meeting center of Seniorenwelzijn or Soos Blauwhuis. In addition, all of them were exposed repeatedly to the researchers' presence or informative meetings, which again underlines the importance of social bonding within a study with seniors.

These efforts combined led to many interested seniors, but because of the COVID-19 pandemic just before the actual start of the pilot study in the Netherlands, interests dropped substantially, leading to a lower number of included participants. Additionally, the initial plan was to increase engagement by regular social meetings at the senior centre, and share and compare their experiences with each other, combining the social gathering of users with a form of competition. But, the COVID-19 outbreak obliged to modify this initiative.

3.1.2 Chronogram of activities

The starting date of the recruitment stage was stepped in the three pilot sites. In the case of Barcelona and Monza it started after the approval if the Ethical Committee of the Universidad Autonoma de Barcelona, the 30th of October December, and the field work the 3rd February 2020. In the case of Rotterdam, the process of submission and approval required more time and after the approval of the Ethical Committee the 20th February, it was planned to start the recruitment in March. Due to the general confinement in all Europe several of the scheduled activities that required physical visits were cancelled or delayed. During this period, some tests were assessed online or by phone and intervention participants received support

After the COVID-19 confinement period the activities were re-started the 22nd June in Barcelona but with some restrictions and adapting the visits to the situation. In Monza, the pilot activities started with some delay in the middle of July because of the restrictions that remained in Italy and The Netherlands. In the case of Rotterdam, the field work restarted in September, but it was required to fix a deadline to include new volunteers until the end of October and put the efforts in the installations and support to the intervention participants.

Although the COVID-19 second wave started in November, pilot activities continued their activities but reinforcing the safety measures during the face-to-face visits and prioritizing online assessments when it was possible. In the case of Monza due to the nature of their activities it was problematic because their facilities were closed.

In the case of the three pilot sites it was agreed to extend the intervention in participants as much as it was possible until the beginning of January, according their willingness to continue because the situation. Some participants in November and December decided to stop their participation in Barcelona. But most of them accepted to do the post-assessment.

3.1.3 Recruitment results

In the three pilot sites 236 people were interviewed to be informed about the study, its requirements and to offer them the possibility to participate. 127 performed the screening phase. Nevertheless, only 78 people who were keen to participate met all the inclusion criteria.

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To illustrate the pilot sites efforts for the sample recruitment it could be used the case of Barcelona site. In this case it was contacted 673 older persons. Only 100 were initially interested or meet the basic inclusion criteria. It was screened 62 subjects and finally were assessed 32 volunteers (see figure 1. Barcelona efforts for recruitment).

Figure 1. Barcelona efforts for recruitment

The recruitment required approximately 90 to 100 hours per site within a 3-5 month term; thus, 30 interviewees needed to be recruited in each of the three pilot sites (see annex 1 recruitment pilot sites flowcharts).

The final sample profile consisted of 20 women and 22 men, of medium-high socio-economic level, with studies, excellent health, very active people with high social activity. Additionally, in the case of the Spanish pilot site 3 participants from Latin America enriched the ethnic and cultural background of the study. Regarding digital literacy, although the purpose of this study was not to evaluate in detail the participants' previous digital skills, the findings pointed that the knowledge of most of them was enough to use the Smartphone to attend calls, use WhatsApp or to install an application. A short sample had quite an advanced level due to their professional background or personal interests.

After the recruitment, 3 candidates abandoned before starting the intervention phase and they were replaced. In Barcelona, the initial objective of 30 participants was achieved, 13 in Rotterdam and 24 in Monza. Although in the studies to assess efficacy, sample size is increased to maintain a preset power according to the expected dropouts, it was not the case for pilot studies, so any person passing the 14 days run-in period was not replaced in case of drop-out.

The remaining participants did not enter the study due to various motives. 102 of them didn't want or couldn't participate from the beginning because of different reasons: personal (i.e. lack of time or because their relatives' perception influenced their decision), technical issues (the very complex system to be installed and used, the feeling that the virtual system would be very intrusive), digital skills perception (the feeling that they would not be able to carry it out due to lack of technological knowledge) or altruism profiles (participants were already engaged in other scientific studies related to healthy habits and cognitive wellbeing). On the other side, 49 of them were willing to take part, but could not because of health or technological impairments. Most of them had

health issues, both physical or psychological, incompatible with the studies' eligibility criterion. It turned out to be extremely hard-to-reach people over 65 without comorbidities as hyperthyroidism, cardiovascular, respiratory or neurological conditions or cancer cured less than 5 years ago. Because of this, during the screening, a short list of health conditions was re-focused in order to facilitate the inclusion of candidates with hypothyroidism, sleep apnea or acute disorders that didn't affect participants to perform the intervention. In terms of technological requirements, many of the interested people were not able to participate because of not having an Android phone, not having an above 7.0 version or not having WiFi at home.

3.1.4 Field work organization

The recruitment process was organized in 3 stages, to dose and balance information depending on the moment and according to the management philosophy "just-in-time" vs "just-in-case": first contact (to inform in plain language what NESTORE was and the requisites to join), in-depth interview (to know better the volunteers' expectancies and their starting point to be volunteers), recruitment visit (to screen and to obtain more information about their needs and requirements). Finally, the recruitment process finalized with the continuous retention activities that were focused on making a special participants' follow-up trying to advance the barriers to facilitate their participation during the baseline assessment, intervention and post-assessment.

As it was previously mentioned, the aim of this first contact was to reach potential participants through people or entities of trust and to explain in general terms what the study consisted of. After this first action, any person showing interest was invited to come to the office to an in-depth interview, where the research team explained the study in more detail, solved all the possible doubts, tried to obtain a participant's profile of interests, needs, but also to identify barriers and manage their expectations. This step was essential, as it was the beginning of a bonding relationship of trust between the researchers and the participants.

During the in-depth interview, the three pilot sites obtained a first participants' profile to understand what motivated them to get involved in the study, their expectancies regarding their participation and if there existed any limitations or barriers that could affect their participation in order to be addressed at later stages.

In the in-depth interviews some limitations were verbalized in some cases to attend the visits because some participants had schedule problems to attend the visits or to travel long distances to reach the office. To overcome these obstacles, the research team always offered first the maximum flexibility in schedules but also the possibility of mobilising themselves depending on the type of the visit that required to be scheduled. When participants' presence was essential, the travel was organised (by taxi) and the cost paid. Every solution was always offered to help the participants' performance in the project. When COVID-19 pandemic disrupted the fieldwork and participants' lives, the virtual assessments and phone-call visits were always prioritized.

During the screening visit, several measurements needed for the screening were taken. The length of this visit was of approximately an hour, where participants were adequately welcomed and guided to help volunteers to feel comfort and trust during their visit.

Because of participants' busy profile, it was a challenge to align the study design with the rhythm of their daily activities. The first informative interview took approximately one hour, half to explain the project in depth and another half to carry out the screening tests if interested. After that, the duration of the baseline assessments in the pilot sites was as follows: one hour to carry out the physical tests and characterisation of the sample (sociodemographic and health status); the cognitive and mental assessments including the NESTORE App-based tests (three hours); and the nutritional evaluation (an hour). It was also necessary to schedule another day to carry out the installation at home (an average of between two hours to four) and in most cases several more contacts were needed by phone or in person both in the offices and in their homes, to check and fix failures in the system. After ending the two daily tracking weeks, users were committed to fulfil an online usability questionnaire and after this, they were asked to perform an intermediate assessment and finally, to complete the three additional final tests related to the Technology Acceptance Model (TAM). Participants needed to repeat all the tests mentioned previously in the final assessment by the end of the study.

Therefore, a total of, on average, 10 hours of evaluation, and without including the needed hours to give the technical support or attend intervention group's doubts after the system installation. Reconciling it with the volunteers' lives was a big barrier, as well as managing their fatigue and frustration, for example when participants were performing some tests based on the use of the system or when some recurrent incidences emerged after the system installation. Pilot sites adopted strategies for this situation, as offering a coffee break and snacks to make the long evaluations more enjoyable or giving full support after the installation contributed to the fatigue reduction, but also participants could perceive a certain continuity in their follow-up during the intervention stage.

However, the fact that the evaluations were so numerous and long also had a very positive effect: the constant interaction between the researchers and the participants. After so many calls and meetings, the relationship between the two parties became one of trust and one of the reasons that helped and encouraged participants to continue in the project. Especially during the confinement, this relationship in most of the cases helped to maintain their interest in the project.

3.1.1.5 Barriers detected during the recruitment, screenings and baseline assessments

Barriers in recruitment

Several barriers emerged during the recruitment. Thus, the main obstacle in our study, it was the difficulty of finding older people between 65 to 75 that could meet the eligibility criterion, not only the health requirements, but also all the technological requirements and to have enough free time to take part in it.

The NESTORE eligibility criterion is very specific, consequently it was very difficult to maintain the aim to detect the maximum of problems, when this capacity relies on: the amount of subjects, the profiles diversity and the lived situations and also the timespan of use. But also, to find participants with heterogeneous backgrounds that could emerge different views about the system or experienced diverse situations.

Barriers in the screenings

Despite the attractiveness of the project's purpose, some barriers pushed an important part of the pre-contacted candidates to decide not to continue with the screening. Seniors developed a first impression of the complexity of the project in base of the provided explanations and informative materials that affected their final decision to join the pilot study. One of the most commented was the project technological requirements, not only understood in required subjects' digital skills, but also in the high demanded system tasks to foster their healthy aging and wellbeing in the intervention phase.

On the other hand, there were participants that evaluate that their data privacy could be compromised during the study because the existence of vulnerabilities, or the system could be very intrusive with their daily activities. Also, some resistances emerged when candidates shared the possibility to join the study in their private circle (especially with couples or siblings).

Barriers in the baseline assessments

Some barriers appeared during the baseline assessments related to the order to deliver some tests or tools and to schedule the visits. One of the most problematic was to synchronize the moment to deliver the dietary register to participants with the precise days that they need to fulfil it and then attend the nutritional visit. During this visit the document was reviewed with the nutritionist. But, in order to validate the nutritional app by the intervention group, it was required that the user had operative the NESTORE Coach app and the 5-system-based tests were previously assessed. Due to this circumstance detected in the Barcelona pilot site, it was modified the order of the cognitive and social system-based tests to facilitate that users have completed this part until they needed to start the process to complete the dietary register. This change helped to advance to the users the explanation of how to use the app and how to register their daily meals during three consecutive days.

The group of participants that completed the dietary register without synchronizing the app use where asked to repeat it after the COVID-19 confinement period. The majority accepted to repeat it.

On the other hand, in the Barcelona pilot site 5 participants experienced incidences when they were asked to perform the system-based tests. After fulfilling all questionnaires, the system was blocked. The participants accepted to repeat them once again but after falling again they desisted. It is important to highlight not only the required time to be invested by participants to complete the 5 tests, but also the risk of mental fatigue, loss of motivation and trust in the system. Because of this, the consortium agreed to not ask to this participants' group to repeat it again for two main reasons: first because they have developed a use of the system knowledge that affect their performance and second because they will be affected by the fatigue although they could repeat the test after several weeks. But it was considered better to note the incidences and continue with the two weeks of daily tracking in these cases.

One of the biggest and unexpected barriers in the NESTORE project, it was to face the COVID-19 pandemic. In the research contest it is usual to develop a mitigation plan in order to establish the process to be applied to identify, record, manage and monitor risks and to define the steps for the contingency planning when an identified risk cannot be completely avoided or mitigated. But the circumstances occurred during the outbreak could not be expected neither contained.

Considering that seniors are part of the highest risk group, all the research activities completely stopped for their safety. It continued a small scale by phone and email to facilitate online assessments or technological support. However, the participants' understandable fear of getting involved or continuing in the project, greatly affected the recruitment, assessment process and installations. Despite this, some good practices were applied to guarantee the participants and research team's safety as the "Safety first decalogue" document, where the main recommendations were compiled to be applied during the face-to-face assessments and installations when activities could be restarted. The document was based on official resources as the European Commission and the Center for Disease Control (CDC). Finally, when the field work could continue, the research team prioritized measures that could ease their safety participation as the home visits with a strict safety protocol performance, organized and paid transport to the facilities and especially, online assessments for the tests that were able to be performed in a non-presential format. But, the impact of the COVID-19 pandemic had an unforeseen impact with the increase of the withdrawal rate.

3.2 Sample characteristics

Currently only Barcelona has introduced all the cases of the first assessment. In Rotterdam the sample size is lower than expected or the reasons already explained, with a balance in the introduction of groups, whereas in Milan the data is too incomplete to draw conclusions of basal parameters.

Table 1. Cases recruited by site

	Control		Intervention		Total	
	n	Column %	n	Column %	n	Column %
Site						
Total	13	100.0%	33	100.0%	46	100.0%
Barcelona	10	76.9%	22	66.7%	32	69.6%
Milan	0	0.0%	3	9.1%	3	6.5%
Rotterdam	3	23.1%	8	24.2%	11	23.9%

3.2.1 Sociodemographic.

Sociodemographic are shown in tables 2 and 3. It is worthy to notice that the level of education is greater than expected in relation to the general population of their age. 85% lives in a house of his/her partner property. In relation to living arrangement 65% has a partner although only 54% are currently married and only 18% reports living alone.

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Table 2. Age of the participants

	Control	Intervention	Total
Age			
N valid	13	31	44
Mean	71.69	69.58	70.20
Std Dev	2.90	3.51	3.45
Median	73	69	71
P25	70	66	67
P75	74	72	73

Table 3. Sociodemographic characteristics

	Control		Intervention		Total	
	n	Column %	n	Column %	n	Column %
Gender						
Total	13	100.0%	32	100.0%	45	100.0%
Men	8	61.5%	13	40.6%	21	46.7%
Women	5	38.5%	19	59.4%	24	53.3%
Educational level						
Total	13	100.0%	32	100.0%	45	100.0%
Primary studies	1	7.7%	1	3.1%	2	4.4%
Secondary studies	6	46.2%	19	59.4%	25	55.6%
University studies.	6	46.2%	12	37.5%	18	40.0%

Table 3. Sociodemographic characteristics (continued).

	Control		Intervention		Total	
	n	Column %	n	Column %	n	Column %
Home owning						
Total	13	100.0%	33	100.0%	46	100.0%
Of your own/partner	9	69.2%	30	90.9%	39	84.8%
Rented	4	30.8%	3	9.1%	7	15.2%
Partner						
Total	13	100.0%	33	100.0%	46	100.0%
No	3	23.1%	13	39.4%	16	34.8%
Yes	10	76.9%	20	60.6%	30	65.2%
Civil status						
Total	13	100.0%	33	100.0%	46	100.0%
Never married	0	0.0%	4	12.1%	4	8.7%
Married	8	61.5%	17	51.5%	25	54.3%
Widowed	1	7.7%	8	24.2%	9	19.6%
Separated/divorced	4	30.8%	4	12.1%	8	17.4%
Cohabiting persons						
Total	13	100.0%	31	100.0%	44	100.0%
0	2	15.4%	6	19.4%	8	18.2%
1	4	30.8%	16	51.6%	20	45.5%
2	7	53.8%	8	25.8%	15	34.1%
3	0	0.0%	1	3.2%	1	2.3%

3.2.2 Health.

Health characteristics appears in table 4. In overall participants have good overall health and quality of live, and only 38% report to have chronic conditions. Presence of pain affects 45% of the participants.

3.2.3 Level of autonomy.

Participants have a high level of autonomy for both instrumental and basic activities of daily living according to the Short Form – Late Life Disability and Function Instrument (SF-LLDFI) (table 5) and has no ceiling effect.

Table 4. Health

	Control		Intervention		Total	
	n	**Column %**	**n**	**Column %**	**n**	**Column %**
Overall health						
Total	13	100.0%	32	100.0%	45	100.0%
very good	6	46.2%	8	25.0%	14	31.1%
good	4	30.8%	22	68.8%	26	57.8%
fair	3	23.1%	2	6.3%	5	11.1%
Quality of life						
Total	13	100.0%	32	100.0%	45	100.0%
very poor	1	7.7%	1	3.1%	2	4.4%
neither poor nor good	0	0.0%	1	3.1%	1	2.2%
good	7	53.8%	22	68.8%	29	64.4%
very good	5	38.5%	8	25.0%	13	28.9%
Chronic conditions						
Total	13	100.0%	32	100.0%	45	100.0%
yes	5	38.5%	12	37.5%	17	37.8%
no	8	61.5%	20	62.5%	28	62.2%
Pain						
Total	13	100.0%	32	100.0%	45	100.0%
I have no pain	8	61.5%	17	53.1%	25	55.6%
I have mild pain	4	30.8%	12	37.5%	16	35.6%
I have moderate pain	1	7.7%	3	9.4%	4	8.9%

Table 5. Short Form – Late Life Disability and Function Instrument (SF-LLDFI).

	Control	Intervention	Total
Function (15 to 75)			
N valid	12	28	40
Mean	69.08	68.93	68.98
Std Dev	4.98	5.86	5.55
Median	71.0	70.0	70.5
P25	65.5	68.0	67.0
P75	72.5	73.0	73.0
Disability: frequency (8 to 40)			
N valid	13	28	41
Mean	32.08	33.07	32.76
Std Dev	3.40	3.30	3.32
Median	33.0	33.0	33.0
P25	32.0	31.0	31.0
P75	34.0	36.0	35.0
Disability: limitation (8 to 40)			
N valid	13	29	42
Mean	38.85	38.03	38.29
Std Dev	1.46	2.97	2.61
Median	40.0	40.0	40.0
P25	38.0	37.0	37.0
P75	40.0	40.0	40.0
Overall score (31 to 155)			
N valid	13	31	44
Mean	134.69	127.71	129.77
Std Dev	21.87	29.43	27.35
Median	142.0	139.0	139.0
P25	138.0	130.0	132.5
P75	144.0	144.0	144.0

3.2.4 Anthropometry and body composition.

Anthropometry and body composition appear in tables 6 to 12. It is noteworthy that 4 out 5 participants have a body mass index over the recommended values.

Table 6. Height

	Self reported			Measured		
	Control	**Intervention**	**Total**	**Control**	**Intervention**	**Total**
N valid	12	29	41	12	30	42
Mean	164.42	168.48	167.29	163.04	166.69	165.65
Std Dev	8.20	11.34	10.58	8.51	11.28	10.59
Median	164.5	169.0	167.0	162.5	167.0	166.0
P25	159.0	160.0	160.0	157.0	157.0	157.0
P75	169.0	176.0	176.0	169.0	175.0	173.8

Table 7. Weight and Body Mass Index

	Weight			Body Mass Index		
	Control	**Intervention**	**Total**	**Control**	**Intervention**	**Total**
N valid	11	30	41	11	30	41
Mean	73.52	81.88	79.64	27.91	29.23	28.88
Std Dev	14.39	18.70	17.87	3.41	4.93	4.57
Median	68.00	80.40	78.10	26.98	28.94	28.27
P25	62.10	64.90	62.70	25.28	25.48	25.48
P75	79.80	97.50	96.70	30.13	33.30	32.18

Table 8. Body weight category

	Control		Intervention		Total	
	n	**Column %**	**n**	**Column %**	**n**	**Column %**
BMI						
Total	11	100.0%	30	100.0%	41	100.0%
Normal	1	9.1%	7	23.3%	8	19.5%
Overweight	7	63.6%	11	36.7%	18	43.9%
Obese	3	27.3%	12	40.0%	15	36.6%

Table 9. Waist circumference.

	Control	Intervention	Total
Waist circumference			
N valid	12	30	42
Mean	102.16	103.62	103.20
Std Dev	12.96	14.52	13.95
Median	100.25	104.75	104.25
P25	92.70	93.00	93.00
P75	107.50	111.00	109.03

Table 10. Anthropometry. Lower limb.

	Control	Intervention	Total
Thigh circumference (cm)			
N valid	12	29	41
Mean	51.02	53.41	52.71
Std Dev	5.91	5.99	5.99
Median	50.85	53.00	52.33
P25	47.67	48.97	47.67
P75	55.83	57.33	56.00
Thigh subcutaneous fat thickness(mm)			
N valid	12	29	41
Mean	22.32	26.89	25.55
Std Dev	8.32	10.64	10.13
Median	22.08	27.33	26.33
P25	18.17	19.00	19.00
P75	25.83	33.33	31.67
Thigh Muscle Cross Sectional Area (cm)			
N valid	12	29	41
Mean	22.00	22.48	22.34
Std Dev	3.20	2.79	2.88
Median	21.22	22.05	22.05
P25	19.56	21.03	20.01
P75	24.45	24.34	24.38

Table 11. Anthropometry. Upper limb.

	Control	Intervention	Total
Middle-Upper arm circumference (cm)			
N valid	12	29	41
Mean	51.02	53.41	52.71
Std Dev	5.91	5.99	5.99
Median	50.85	53.00	52.33
P25	47.67	48.97	47.67
P75	55.83	57.33	56.00
Arm subcutaneous fat thickness(mm)			
N valid	12	29	41
Mean	22.32	26.89	25.55
Std Dev	8.32	10.64	10.13
Median	22.08	27.33	26.33
P25	18.17	19.00	19.00
P75	25.83	33.33	31.67
Arm Muscle Cross Sectional Area (cm)			
N valid	12	29	41
Mean	22.00	22.48	22.34
Std Dev	3.20	2.79	2.88
Median	21.22	22.05	22.05
P25	19.56	21.03	20.01
P75	24.45	24.34	24.38

Table 12. Body composition.

	Control	Intervention	Total
Muscle mass (kg)			
N valid	9	27	36
Mean	45.52	50.08	48.94
Std Dev	11.38	12.64	12.34
Median	41.10	49.10	48.55
P25	38.10	40.40	39.20
P75	51.50	55.50	55.15
Bone mass (kg).			
N valid	9	27	36
Mean	2.71	2.77	2.75
Std Dev	.44	.55	.52
Median	2.70	2.70	2.70
P25	2.30	2.30	2.30
P75	3.10	3.10	3.10
Body fat (%)			
N valid	11	28	39
Mean	34.22	33.47	33.68
Std Dev	9.04	11.46	10.72
Median	34.40	32.10	32.50
P25	27.80	24.80	25.10
P75	41.90	44.10	42.70
Total body water (%)			
N valid	11	28	39
Mean	48.48	45.23	46.14
Std Dev	7.82	10.05	9.49
Median	46.80	47.70	47.50
P25	44.70	36.85	37.50
P75	54.80	52.20	52.40

3.2.5 Physical performance.

Physical performance parameters are shown in table 13

3.2.6 Sleep quality.

Sleep quality has been assessed with the Pittsburgh Sleep Quality Index. The scores of each component are shown in table 14

Table 13. Physical performance, flexibility and balance.

	Control	Intervention	Total
Maximum grip strength (kg)			
Valid n	13	33	46
Mean	32.95	31.13	31.65
Std Dev	8.85	8.94	8.85
Median	34.90	29.00	30.10
P25	26.60	23.60	23.90
P75	40.10	40.90	40.90
6 Minutes Walking Test (m)			
Valid n	12	33	45
Mean	510.00	472.79	482.71
Std Dev	59.12	147.37	130.18
Median	490.50	508.00	501.00
P25	473.50	455.00	470.00
P75	553.50	547.00	550.00
Sit-and-reach test (cm)			
Valid n	13	33	46
Mean	5.62	4.14	4.55
Std Dev	9.72	8.15	8.54
Median	8.00	4.00	4.50
P25	3.00	1.00	1.00
P75	13.00	10.00	12.00
Back scratch test (cm)			
Valid n	13	33	46
Mean	-5.12	-2.85	-3.49
Std Dev	8.90	10.68	10.16
Median	-5.00	1.00	-1.75
P25	-11.00	-16.00	-16.00
P75	3.00	4.00	4.00
Berg Balance Scale Score			
Valid n	12	33	45
Mean	55.67	55.24	55.36
Std Dev	0.78	1.09	1.03
Median	56.00	56.00	56.00
P25	56.00	55.00	55.00
P75	56.00	56.00	56.00

Table 14. Pittsburgh Sleep Quality Index.

	Control	Intervention	Total
Component 1			
Valid n	13	32	45
Mean	1.00	0.94	0.96
Std Dev	0.71	0.67	0.67
Median	1.00	1.00	1.00
P25	1.00	0.50	1.00
P75	1.00	1.00	1.00
Component 2			
Valid n	13	33	46
Mean	1.23	0.79	0.91
Std Dev	0.93	0.89	0.91
Median	1.00	1.00	1.00
P25	1.00	0.00	0.00
P75	2.00	1.00	1.00
Component 3			
Valid n	13	33	46
Mean	1.15	1.42	1.35
Std Dev	0.90	1.20	1.12
Median	1.00	1.00	1.00
P25	1.00	1.00	1.00
P75	1.00	3.00	3.00
Component 4			
Valid n	13	33	46
Mean	2.77	2.73	2.74
Std Dev	0.83	0.88	0.85
Median	3.00	3.00	3.00
P25	3.00	3.00	3.00
P75	3.00	3.00	3.00
Component 5			
Valid n	13	33	46
Mean	0.85	1.03	0.98
Std Dev	0.38	0.47	0.45
Median	1.00	1.00	1.00
P25	1.00	1.00	1.00
P75	1.00	1.00	1.00
			continues

Table 14. Pittsburgh Sleep Quality Index. (continued)

	Control	Intervention	Total
Component 6			
Valid n	13	32	45
Mean	0.46	0.25	0.31
Std Dev	1.13	0.76	0.87
Median	0.00	0.00	0.00
P25	0.00	0.00	0.00
P75	0.00	0.00	0.00
Component 7			
Valid n	13	33	46
Mean	0.46	0.36	0.39
Std Dev	0.66	0.55	0.58
Median	0.00	0.00	0.00
P25	0.00	0.00	0.00
P75	1.00	1.00	1.00
Overall score			
Valid n	13	32	45
Mean	7.92	7.63	7.71
Std Dev	2.99	2.76	2.79
Median	8.00	8.00	8.00
P25	6.00	6.50	6.00
P75	10.00	9.00	9.00

3.2.7 Physical activity.

Physical activity has been assessed with the International Physical Activity Questionnaire For The Elderly (IPAQ-E) (tables 15 and 16). It is noteworthy that although 95% of participants report be moderately or vigorously active during the whole week, the average time spend in sitting position is around 8 hours and 7 minutes.

Table 15. Physical activity level

	Control		Intervention		Total	
	n	Column %	n	Column %	n	Column %
BMI						
Total	13	100.0%	30	100.0%	43	100.0%
Low	0	0.0%	2	6.7%	2	4.7%
Moderate	6	46.2%	16	53.3%	22	51.2%
High	7	53.8%	12	40.0%	19	44.2%

Table 16. Physical Activity.

	Control	Intervention	Total
Overall activities: METs-week			
Valid n	13	30	43
Mean	3.611.62	2.657.82	2.946.17
Std Dev	2.566.81	1.518.03	1.915.73
Median	3.546	2.772	2.826
P25	2.439	1.386	1.386
P75	4.452	3.519	4.044
Sitting: daily average (min)			
Valid n	13	30	43
Mean	500.77	482.27	487.86
Std Dev	189.10	226.26	213.63
Median	480	360	420
P25	420	360	360
P75	480	600	600
Days doing any activity > 10 min†			
Valid n	13	30	43
Mean	10.62	8.97	9.47
Std Dev	3.59	3.45	3.53
Median	11	8	9
P25	7	7	7
P75	14	12	12
† Range from 0 (no activities) to 21 (3 activities/7 days per week).			

3.2.7 Social interactions.

Information about social interactions appear from tables 17 to 21. There is a great variability between participants. On average they have interacted face to face with little less than 7 persons, and around 4 with other ways. Partners are the persons with more direct interaction, whereas daughters and sons are those with higher interaction by other means.

Table 17. Interactions. Number of people that have interacted with today.

	Control	Intervention	Total
In person			
Valid n	14	31	45
Mean	6.36	6.81	6.67
Std Dev	5.24	10.14	8.85
Median	4.0	5.0	5.0
P25	4.0	1.0	3.0
P75	7.0	7.0	7.0
In any other way			
Valid n	14	31	45
Mean	7.00	3.13	4.33
Std Dev	7.90	3.52	5.49
Median	3.0	2.0	2.0
P25	1.0	0.0	0.0
P75	14.0	5.0	6.0

Table 18. Relationship of interactions in person

	Control		Intervention		Total	
	n	Column %	n	Column %	n	Column %
Overall	14	100.0%	31	100.0%	45	100.0%
Partner	6	42.9%	18	58.1%	24	53.3%
Daughter / son	2	14.3%	4	12.9%	6	13.3%
Other family member	3	21.4%	3	9.7%	6	13.3%
Friend	2	14.3%	0	0.0%	2	4.4%
Neighbor	0	0.0%	1	3.2%	1	2.2%
Stranger	0	0.0%	1	3.2%	1	2.2%
Other person	1	7.1%	2	6.5%	3	6.7%

Table 19. Relationship of interactions in other ways

	Control		Intervention		Total	
	n	Column %	n	Column %	n	Column %
Overall	14	100.0%	31	100.0%	45	100.0%
Daughter / son	4	28.6%	8	25.8%	12	26.7%
Partner	4	28.6%	2	6.5%	6	13.3%
Friend	1	7.1%	5	16.1%	6	13.3%
Other family member	1	7.1%	3	9.7%	4	8.9%
Stranger	0	0.0%	2	6.5%	2	4.4%
Other person	1	7.1%	2	6.5%	3	6.7%

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Table 20. Social support.

	Control	Intervention	Total
Berlin Social Support Scale Score			
Valid n	14	31	45
Mean	37,57	38,61	38,29
Std Dev	5,18	6,83	6,33
Median	37	39	38
P25	33	33	33
P75	41	44	44
Satisfaction with social suport (0-10)			
Valid n	14	31	45
Mean	71.00	77.71	75.62
Std Dev	17.26	16.73	16.99
Median	72.5	80.0	80.0
P25	60.0	70.0	60.0
P75	80.0	90.0	90.0

Table 21. Perception of today accompaniment

	Control		Intervention		Total	
	n	**Column %**	**n**	**Column %**	**n**	**Column %**
Missing having people around						
Total	14	100.0%	31	100.0%	45	100.0%
Yes	2	14.3%	2	6.5%	4	8.9%
More or less	5	35.7%	4	12.9%	9	20.0%
No	7	50.0%	25	80.6%	32	71.1%
Feeling not enough people close to						
Total	14	100.0%	31	100.0%	45	100.0%
Yes	0	0.0%	1	3.2%	1	2.2%
More or less	3	21.4%	0	0.0%	3	6.7%
No	11	78.6%	30	96.8%	41	91.1%

3.2.8 Psychological aspects.

Wellbeing has been assessed with the WHO (five) Well-being Index score (1998 version). The complete score are show in table 22, whereas individual items are shown in tables 23 and 24. Ageing satisfaction has been assessed with the sub-scale of Attitude Toward Own Aging from the Philadelphia Geriatric Center Morale Scale, which results appears in table 25, whereas Self-Efficacy results assessed with the General Self-Efficacy Scale appear in table 26 .

Aspects related with personality have been assessed with the Big Five Inventory 10 (table 27), the Multidimensional Affect Questionnaire (table 28) and the Trait Discrete Affects form of the Discrete Emotions Questionnaire (table 29)

For each dimension addressed by the intervention we have assessed several aspects of the Health Action Process Approach (tables 30 to 39), namely the risk awareness, the positive outcomes expectancy, the motivational self-efficacy, the behavioural intention, the recovery self-efficacy, the action and coping planning, and the action control (awareness of standards, self-monitoring and self-regulatory effort).

Table 22. WHO (five) Well-being Index score (1998 version).

	Control	Intervention	Total
0 to 25 scale			
Valid n	14	29	43
Mean	17.86	17.97	17.93
Std Dev	4.70	2.60	3.37
Median	19	18	18
P25	15	16	16
P75	21	19	20
0 to 100 scale			
Valid n	14	29	43
Mean	71.43	71.86	71.72
Std Dev	18.82	10.39	13.48
Median	76	72	72
P25	60	64	64
P75	84	76	80

Table 23. WHO (five) Well-being Index score (1998 version). Feelings and perceptions scores.

	Control	Intervention	Total
I have felt cheerful and in good spirits			
Valid n	14	30	44
Mean	3.29	3.60	3.50
Std Dev	0.99	0.77	0.85
Median	3	4	4
P25	3	3	3
P75	4	4	4
I have felt calm and relaxed			
Valid n	14	31	45
Mean	3.64	3.58	3.60
Std Dev	1.01	0.72	0.81
Median	4	4	4
P25	3	3	3
P75	4	4	4
I have felt active and vigorous			
Valid n	14	31	45
Mean	3.86	3.61	3.69
Std Dev	1.23	0.84	0.97
Median	4	4	4
P25	3	3	3
P75	5	4	4
I woke up feeling fresh and rested			
Valid n	14	31	45
Mean	3.57	3.58	3.58
Std Dev	1.65	0.89	1.16
Median	4	4	4
P25	2	3	3
P75	5	4	4
My daily life has been filled with things that interest me			
Valid n	14	30	44
Mean	3.50	3.83	3.73
Std Dev	0.85	0.79	0.82
Median	3	4	4
P25	3	3	3
P75	4	4	4

Table 24. WHO (five) Well-being Index score (1998 version). Feelings and perceptions categories.

	Control		Intervention		Total	
	n	Column %	n	Column %	n	Column %
Cheerful and in good spirits						
Total	14	100.0%	30	100.0%	44	100.0%
Some of the time	1	7.1%	0	0.0%	1	2.3%
< half of the time	1	7.1%	2	6.7%	3	6.8%
> half of the time	6	42.9%	11	36.7%	17	38.6%
Most of the time	5	35.7%	14	46.7%	19	43.2%
All the time	1	7.1%	3	10.0%	4	9.1%
Calm and relaxed						
Total	14	100.0%	31	100.0%	45	100.0%
Some of the time	1	7.1%	0	0.0%	1	2.2%
< half of the time	0	0.0%	2	6.5%	2	4.4%
> half of the time	4	28.6%	11	35.5%	15	33.3%
Most of the time	7	50.0%	16	51.6%	23	51.1%
All the time	2	14.3%	2	6.5%	4	8.9%
Active and vigorous						
Total	14	100.0%	31	100.0%	45	100.0%
Some of the time	1	7.1%	1	3.2%	2	4.4%
< half of the time	1	7.1%	1	3.2%	2	4.4%
> half of the time	2	14.3%	10	32.3%	12	26.7%
Most of the time	5	35.7%	16	51.6%	21	46.7%
All the time	5	35.7%	3	9.7%	8	17.8%
I woke up feeling fresh and rested						
Total	14	100.0%	31	100.0%	45	100.0%
Some of the time	3	21.4%	0	0.0%	3	6.7%
< half of the time	1	7.1%	3	9.7%	4	8.9%
> half of the time	1	7.1%	12	38.7%	13	28.9%
Most of the time	3	21.4%	11	35.5%	14	31.1%
All the time	6	42.9%	5	16.1%	11	24.4%
My daily life has been filled with things that interest me						
Total	14	100.0%	30	100.0%	44	100.0%
< half of the time	0	0.0%	1	3.3%	1	2.3%
> half of the time	10	71.4%	9	30.0%	19	43.2%
Most of the time	1	7.1%	14	46.7%	15	34.1%
All the time	3	21.4%	6	20.0%	9	20.5%

Table 25. Ageing satisfaction: sub-scale of Attitude Toward Own Aging from the Philadelphia Geriatric Center Morale Scale.

	Control	Intervention	Total
Attitude Toward Own Aging Sub-Scale Score			
Valid n	14	31	45
Mean	3.71	4.23	4.07
Std Dev	1.49	1.23	1.32
Median	4	5	4
P25	3	4	4
P75	5	5	5

Table 26 General Self-Efficacy Scale (GSE) Score.

	Control	Intervention	Total
Score			
Valid n	13	30	43
Mean	31.85	32.13	32.05
Std Dev	4.26	4.51	4.39
Median	32.0	31.0	32.0
P25	30.0	28.0	29.0
P75	34.0	35.0	35.0

Table 27. Personality: Big Five Inventory.

	Control	Intervention	Total
Extraversion			
Valid n	14	31	45
Mean	5.86	4.71	5.07
Std Dev	2.18	1.72	1.92
Median	6.0	4.0	5.0
P25	5.0	4.0	4.0
P75	7.0	6.0	6.0
Agreeableness			
Valid n	14	31	45
Mean	5.50	5.55	5.53
Std Dev	1.34	1.29	1.29
Median	5.5	6.0	6.0
P25	5.0	5.0	5.0
P75	6.0	7.0	6.0
Conscientiousness			
Valid n	14	31	45
Mean	6.93	7.13	7.07
Std Dev	1.27	1.45	1.39
Median	7.0	7.0	7.0
P25	6.0	6.0	6.0
P75	7.0	8.0	8.0
Neuroticism			
Valid n	14	30	44
Mean	6.64	6.83	6.77
Std Dev	1.74	1.60	1.63
Median	7.0	7.0	7.0
P25	5.0	6.0	6.0
P75	8.0	8.0	8.0
Openness			
Valid n	14	31	45
Mean	7.43	7.71	7.62
Std Dev	1.87	1.47	1.59
Median	7.0	8.0	8.0
P25	6.0	6.0	6.0
P75	10.0	9.0	9.0

Table 28. Multidimensional Affect Questionnaire. Trait dimensions.

	Control	Intervention	Total
Energetic arousal			
Valid n	14	31	45
Mean	9.07	9.23	9.18
Std Dev	1.82	2.11	2
Median	9.0	10.0	9.0
P25	8.0	7.0	7.0
P75	11.0	11.0	11.0
Valence			
Valid n	13	28	41
Mean	9.46	8.46	8.78
Std Dev	1.81	2.43	2.27
Median	10.0	8.5	9.0
P25	8.0	6.5	7.0
P75	11.0	10.0	10.0
Calmness			
Valid n	13	30	43
Mean	9.15	8.53	8.72
Std Dev	1.41	2.83	2.48
Median	9.0	9.0	9.0
P25	8.0	6.0	7.0
P75	10.0	11.0	11.0

Table 29. Trait discrete affects. Discrete Emotions Questionnaire. To what extend have felt today.

	Control	Intervention	Total
Angry			
Valid n	14	31	45
Mean	0.14	0.42	0.33
Std Dev	0.36	0.92	0.80
Median	0	0	0
P25	0	0	0
P75	0	1	0
Disgusted			
Valid n	14	31	45
Mean	0.21	0.29	0.27
Std Dev	0.43	0.82	0.72
Median	0	0	0
P25	0	0	0
P75	0	0	0
Fearful			
Valid n	14	31	45
Mean	0.43	0.71	0.62
Std Dev	0.94	1.27	1.17
Median	0	0	0
P25	0	0	0
P75	0	1	1
Happy			
Valid n	14	31	45
Mean	4.64	4.97	4.87
Std Dev	1.45	0.91	1.10
Median	5	5	5
P25	4	4	4
P75	6	6	6
Sad			
Valid n	14	31	45
Mean	0.64	0.61	0.62
Std Dev	1.01	1.02	1.01
Median	0	0	0
P25	0	0	0
P75	1	1	1

Table 30. HAPA. Risk awareness.

	Control	Intervention	Total
Physical[1]			
Valid n	14	31	45
Mean	8	7.81	7.87
Std Dev	2.39	1.74	1.94
Median	9	8	8
P25	8	7	7
P75	10	9	9
Nutritional[2]			
Valid n	14	31	45
Mean	7.14	7.39	7.31
Std Dev	3.08	2.04	2.38
Median	8	8	8
P25	5	7	7
P75	9	9	9
Mental[3]			
Valid n	14	31	45
Mean	7.64	8.23	8.04
Std Dev	2.10	1.48	1.69
Median	8	8	8
P25	6	7	7
P75	9	9	9
Social[4]			
Valid n	14	31	45
Mean	7.50	7.55	7.53
Std Dev	2.50	1.98	2.13
Median	8	8	8
P25	7	7	7
P75	9	9	9

1. If I am not regularly physically active. the probability is high that this will negatively impact my overall health
2. If I am not regularly adhering to a balanced diet. the probability is high that this will negatively impact my overall health
3. If I am not regularly challenging my brain. the probability is high that this will negatively impact my overall health
4. If I am not regularly socially engaged. the probability is high that this will negatively impact my overall health

Table 31. HAPA. Positive Outcome Expectancy.

	Control	Intervention	Total
Physical[1]			
Valid n	14	31	45
Mean	9	8.84	8.89
Std Dev	1.24	1.19	1.19
Median	9.5	9.0	9.0
P25	8.0	8.0	8.0
P75	10.0	10.0	10.0
Nutritional[2]			
Valid n	14	31	45
Mean	8.71	8.87	8.82
Std Dev	1.59	.99	1.19
Median	9.0	9.0	9.0
P25	8.0	8.0	8.0
P75	10.0	10.0	10.0
Mental[3]			
Valid n	14	31	45
Mean	9.07	9.10	9.09
Std Dev	1.44	1.16	1.24
Median	10.0	9.0	10.0
P25	8.0	8.0	8.0
P75	10.0	10.0	10.0
Social[4]			
Valid n	14	31	45
Mean	8.07	8.29	8.22
Std Dev	1.69	1.44	1.51
Median	8.0	8.0	8.0
P25	7.0	7.0	7.0
P75	10.0	10.0	10.0

1. There are more advantages than disadvantages in being physically active on a regular basis
2. There are more advantages than disadvantages in making healthy food and drink choices on a regular basis
3. There are more advantages than disadvantages in training my brain on a regular basis
4. There are more advantages than disadvantages in being socially engaged on a regular basis

Table 32. HAPA. Motivational Self- Efficacy.

	Control	Intervention	Total
Physical[1]			
Valid n	14	31	45
Mean	8.50	8.23	8.31
Std Dev	1.87	1.73	1.76
Median	9.0	8.0	9.0
P25	8.0	8.0	8.0
P75	10.0	10.0	10.0
Nutritional[2]			
Valid n	14	31	45
Mean	7.86	7.74	7.78
Std Dev	2.35	1.53	1.80
Median	8.0	7.0	8.0
P25	7.0	7.0	7.0
P75	10.0	9.0	9.0
Mental[3]			
Valid n	14	31	45
Mean	8.21	8.48	8.40
Std Dev	2.52	1.15	1.67
Median	9.0	8.0	8.0
P25	8.0	8.0	8.0
P75	10.0	10.0	10.0
Social[4]			
Valid n	14	31	45
Mean	8.14	8.03	8.07
Std Dev	1.96	1.49	1.63
Median	8.5	8.0	8.0
P25	7.0	7.0	7.0
P75	10.0	9.0	10.0

1. I am confident that I will regularly engage in physical activity in the next three months. even if it is difficult
2. I am confident that I will regularly carefully select what I eat and drink in the next three months. even if it is difficult
3. I am confident that I will regularly engage in activities that challenge my thinking abilities in the next three months. even if it is difficult.
4. I am confident that I will regularly engage socially in the next three months. even if it is difficult

Table 33. HAPA. Behavioural Intention.

	Control	Intervention	Total
Physical[1]			
Valid n	14	31	45
Mean	9	8.45	8.62
Std Dev	1.47	1.86	1.75
Median	10.0	9.0	9.0
P25	8.0	7.0	8.0
P75	10.0	10.0	10.0
Nutritional[2]			
Valid n	14	31	45
Mean	8.07	8.16	8.13
Std Dev	2.27	1.37	1.67
Median	8.0	8.0	8.0
P25	8.0	7.0	7.0
P75	10.0	9.0	10.0
Mental[3]			
Valid n	14	31	45
Mean	8.29	8.48	8.42
Std Dev	2.64	1.12	1.71
Median	9.5	8.0	8.0
P25	8.0	8.0	8.0
P75	10.0	10.0	10.0
Social[4]			
Valid n	14	31	45
Mean	8.14	8.32	8.27
Std Dev	2.14	1.49	1.70
Median	8.5	8.0	8.0
P25	8.0	7.0	8.0
P75	10.0	10.0	10.0
1. In the next three months. I intend to be regularly physically active			
2. In the next three months. I intend to regularly carefully select what I eat and drink			
3. In the next three months. I intend to regularly engage in activities that challenge my thinking abilities			
4. In the next three months. I intend to regularly socially engage			

Table 34. HAPA. Recovery Self-Efficacy.

	Control	Intervention	Total
Physical[1]			
Valid n	14	31	45
Mean	8.64	7.81	8.07
Std Dev	1.65	1.60	1.64
Median	9	8	8
P25	8	7	7
P75	10	9	9
Nutritional[2]			
Valid n	14	31	45
Mean	7.79	7.94	7.89
Std Dev	2.22	1.31	1.63
Median	8	8	8
P25	7	7	7
P75	9	9	9
Mental[3]			
Valid n	14	31	45
Mean	8.64	8.45	8.51
Std Dev	1.82	1.23	1.42
Median	10	8	9
P25	8	8	8
P75	10	10	10
Social[4]			
Valid n	14	31	45
Mean	7.79	8	7.93
Std Dev	2.12	1.51	1.70
Median	8	8	8
P25	7	7	7
P75	10	9	9

1. I am confident that I can be as physically active during the next three months as I have planned even when barriers arise
2. I am confident that I can be as healthy in my food and drink choices during the next three months as I have planned even when barriers arise
3. I am confident that I can be as cognitively active during the next three months as I have planned even when barriers arise
4. I am confident that I can be as socially active during the next three months as I have planned even when barriers arise

Table 35. HAPA. Action Planning.

	Control	Intervention	Total
Physical[1]			
Valid n	14	31	45
Mean	6.64	6.13	6.29
Std Dev	3.61	2.77	3.02
Median	7	6	6
P25	5	5	5
P75	10	8	9
Nutritional[2]			
Valid n	14	31	45
Mean	5.86	6.39	6.22
Std Dev	3.66	2.97	3.17
Median	7	7	7
P25	5	5	5
P75	9	9	9
Mental[3]			
Valid n	14	31	45
Mean	6	6.52	6.36
Std Dev	3.94	2.89	3.21
Median	5	7	7
P25	5	5	5
P75	10	8	9
Social[4]			
Valid n	14	31	45
Mean	4.71	6.32	5.82
Std Dev	3.58	2.81	3.12
Median	5	6	6
P25	0	5	5
P75	7	9	8

1. I have made detailed plans for when and how I will be will be regularly physically active in the next three months
2. I have made detailed plans for when and how I will be regularly eating and drinking in a balanced and healthy way in the next three months
3. I have made detailed plans for when and how will be regularly challenging my thinking abilities and brain in the next three months
4. I have made detailed plans for when and how will be regularly socially active in the next three months

Table 36. HAPA. Coping Planning.

	Control	Intervention	Total
Physical[1]			
Valid n	14	31	45
Mean	4.86	4.52	4.62
Std Dev	3.39	3.12	3.17
Median	5	5	5
P25	3	1	2
P75	8	7	7
Nutritional[2]			
Valid n	14	31	45
Mean	4.64	4.52	4.56
Std Dev	2.98	3.19	3.09
Median	5	5	5
P25	4	0	2
P75	6	7	7
Mental[3]			
Valid n	14	31	45
Mean	4.21	4.84	4.64
Std Dev	3.42	3.13	3.20
Median	5	5	5
P25	0	3	3
P75	6	7	7
Social[4]			
Valid n	14	31	45
Mean	3.29	4.65	4.22
Std Dev	2.81	3.15	3.08
Median	4	5	5
P25	0	3	2
P75	5	7	7
1. I have made a detailed plan regarding what to do if something interferes with my plans to be physically active 2. I have made a detailed plan regarding what to do if something interferes with my plans to do a healthy diet 3. I have made a detailed plan regarding what to do if something interferes with my plans to challenge my brain 4. I have made a detailed plan regarding what to do if something interferes with my plans to be socially active			

Table 37. HAPA. Action Control: Awareness Of Standards.

	Control	Intervention	Total
Physical[1]			
Valid n	11	23	34
Mean	6.45	5.13	5.56
Std Dev	3.80	3.68	3.72
Median	8	7	7
P25	3	2	2
P75	10	8	9
1. During the last three months. I was always aware of my intended coaching program			

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Table 38. HAPA. Action Control: Self-Monitoring.

	Control	Intervention	Total
Physical[1]			
Valid n	13	30	43
Mean	5.77	5.67	5.70
Std Dev	3.65	3.03	3.19
Median	7	6	6
P25	5	3	3
P75	8	8	8
Nutritional[2]			
Valid n	13	30	43
Mean	5.69	5.80	5.77
Std Dev	3.73	3	3.19
Median	7	6	6
P25	4	4	4
P75	8	8	8
Mental[3]			
Valid n	13	30	43
Mean	6.08	5.70	5.81
Std Dev	3.95	2.96	3.25
Median	7	7	7
P25	4	4	4
P75	10	8	8
Social[4]			
Valid n	13	30	43
Mean	5.54	5.13	5.26
Std Dev	3.69	3.15	3.28
Median	6	5	5
P25	4	3	3
P75	8	7	8

1. During the last three months. I constantly monitored whether I was as physically active as I had planned
2. During the last three months. I constantly monitored whether I was eating and drinking as healthily as I had planned
3. During the last three months. I constantly monitored whether I was challenging my thinking abilities and brain as I had planned
4. During the last three months. I constantly monitored whether I was as socially active as I had planned

Table 39. HAPA. Action Control: Self-Regulatory Effort.

	Control	Intervention	Total
Physical[1]			
Valid n	13	30	43
Mean	6.62	6.70	6.67
Std Dev	4.01	2.79	3.16
Median	9	7	7
P25	5	5	5
P75	9	9	9
Nutritional[2]			
Valid n	13	30	43
Mean	6.31	6.93	6.74
Std Dev	3.90	2.33	2.86
Median	7	7	7
P25	5	5	5
P75	10	8	9
Mental[3]			
Valid n	13	30	43
Mean	6.69	6.90	6.84
Std Dev	4.11	2.12	2.82
Median	9	8	8
P25	5	5	5
P75	10	8	9
Social[4]			
Valid n	13	30	43
Mean	5.54	6.47	6.19
Std Dev	4.24	2.49	3.10
Median	7	6	6
P25	0	5	5
P75	10	9	9

1. During the last three months. I always tried to be as physically active as I had intended
2. During the last three months. I always tried to be eating and drinking as healthily as I had intended.
3. During the last three months. I always tried to be challenging my thinking abilities and brain as I had planned.
4. During the last three months. I always tried to be as socially active as I had planned.

3.2.9 Cognitive aspects.

In relation to cognitive aspects, results about processing speed and memory appear in table 40,

Table 40. Cognitive assessments.

	Control	Intervention	Total
Time to complete Trail Making Test part A (s)			
Valid n	14	31	45
Mean	32.07	30.58	31.04
Std Dev	11.65	10.98	11.08
Median	31.0	28.0	31.0
P25	25.0	22.0	23.0
P75	35.0	38.0	38.0
Time to complete Trail Making Test part B (s)			
Valid n	14	31	45
Mean	69.93	72.32	71.58
Std Dev	21.84	23.01	22.43
Median	69.0	65.0	65.0
P25	54.0	55.0	55.0
P75	83.0	91.0	83.0
Processing speed .Digit Symbol Substitution Test. Time (s)			
Valid n	14	30	44
Mean	48.21	49.23	48.91
Std Dev	11.75	12.43	12.09
Median	47.5	50.0	49.5
P25	39.0	39.0	39.0
P75	54.0	59.0	56.5
Everyday memory failure score			
Valid n	14	30	44
Mean	4.64	3.10	3.59
Std Dev	2.53	2.32	2.47
Median	5.5	3.0	4.0
P25	2.0	1.0	1.0
P75	6.0	5.0	5.5
Are you satisfied with your cognitive functioning			
Valid n	13	30	43
Mean	69.62	79.10	76.23
Std Dev	16	13.36	14.69
Median	75.0	80.0	80.0
P25	60.0	75.0	70.0
P75	80.0	85.0	85.0

Annex

Recruitment Pilot sites flowcharts

Barcelona pilot site

Monza pilot site

Social media: 1400	
Contacted: 583	
Group meetings: 240	Not interested → 573
Phone call: 200	
Face to face: 43	

Informative sessions: 100 — Not interested or discarded → 41

Screened: 51 — Not met eligibility criteria → 27

Met inclusion criteria: 24 — Rejected to continue → 0

Assessed: 22

Control group 1st visit: 3

Intervention group 1st visit: 19

Control group 2nd visit: 0

Intervention group 2nd visit: 0

Rotterdam pilot site

Contacted directly: 374	
Group meetings: 320	
Magazine of senior center: ~1000	
Face to face: 54	

Not interested → ~570

Informative sessions: 36

Not interested or discarded → 20

Screened: 16

Not met eligibility criteria → 3

Met inclusion criteria: 13

Rejected to continue → 0

Assessed: in process

Control group 1st visit:

Intervention group 1st visit:

Control group 2nd visit:

Intervention group 2nd visit: