

YOUNG 50

YOUNG 50 #Stay Healthy – Cardiovascular Risk Prevention

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HP-PJ-02-2018

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YOUNG50 app

Beneficiaries

Country	Name	Acronym
Italy	Azienda ULSS 6 Euganea	ULSS6 Euganea
Italy	Azienda ULSS 4 Veneto Orientale	ULSS4 V. Orient - ProMIS
Luxembourg	Ministère de la Santé	MOHLUX
Luxembourg	Luxembourg Institute of Health	LIH
Lithuania	Viesoji Istaiga Centro Poliklinika	Centro poliklin
Romania	Asociata Aer Pur Romania	AER PUR ROMANIA
Spain	Asociacion Instituto de Investigacion en Servicios de Salud Kronikune	KRONIKGUNE



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SUMMARY

Cardiovascular diseases (CVDs) are a leading cause of mortality in the European Union costing the EU EUR 210 billion per year, due to direct healthcare costs, productivity loss, and informal care by caregivers.¹

The objectives of YOUNG 50 were to estimate cardiovascular risk among the 50-year-old population, identify persons with unhealthy lifestyles, new cases of hypertension, hyperglycaemia and hypercholesterolaemia, activate an integrated model of assistance to help modify or reduce risk factors among healthy subjects, promote interventions to change unhealthy lifestyles, and increase knowledge and perceptions of CVD risks among the general population.

Implementation of YOUNG50 was divided into 3 phases: in Phase 1 the feasibility of implementation and the needs of the implementing partners were assessed through situation analysis and adaptation of the existing materials and IT tools to the local setting; in Phase 2, the YOUNG50 programme was implemented at the pilot sites, with the involvement of health professionals and prevention programmes. The aim of Phase 3 was to evaluate the impact of the action and explore its institutionalisation.

Through early detection, treatment of risk factors, and follow-up, it was envisaged to have findings available on participants receiving motivational counselling and improved their lifestyles and/or medical status. Implementing partners have taken advantage of the transfer and scaling-up of innovative prevention models, including the use of information and communication technology. The expected outcomes include synergy among prevention programmes, the inclusion of CVD prevention in Regional or National Health Plans, and the development of recommendations and policy guidelines.

1. *A European Cardiovascular Health Plan: The need and the ambition. European Alliance for Cardiovascular Health Report, 2022.*



INTRODUCTION

The YOUNG50 project is based on the transfer to other Member States (Lithuania, Luxembourg and Romania) of the Italian CARDIO50 screening programme. The aim of CARDIO50 is to prevent the development of cardiovascular diseases. The entire 50-year-old population of the respective catchment area, registered with the national health service, is invited to screening, provided they are not already being treated for CVDs and not affected by other chronic pathologies.

The programme consists of a first visit to rank the participant according to the risk of developing a cardiovascular pathology, based on a lifestyle survey questionnaire, a short battery of rapid blood tests, and targeted lifestyle motivational counselling. Participants found to have blood chemistry and arterial blood pressure values within the normal reference range, but who also have at least one of the following risk behaviours: tobacco smoking; physical inactivity (less than 150 minutes of moderate physical activity per week); two or less portions of fruit and vegetables per day; high alcohol intake; out-of-range BMI, are called back for a follow-up visit after 6 months. Participants referred for follow up commit to improving one of their risk factors in the intervening period. At the follow up encounter, the health professional and participant discuss whether an improvement has actually been made.

Follow-up is particularly important for assessing the effectiveness of prevention schemes. It is therefore essential to aim for maximum adherence to follow up and to gather high quality patient-reported data. This need prompted the decision to develop an app designed to facilitate systematic collection of lifestyle data by participants between first and follow-up visits, keeping them more motivated and engaged, and empowering them to make lifestyle changes.

The application is appropriately named the YOUNG50 app. It is simple to use and has proven easily transferable to the other implementing countries for piloting. The first version was launched for feasibility testing in June 2022 and presented at the annual YOUNG50 partner meeting in Bilbao. Due to GDPR and other technical constraints, the app could not be transferred to the other partners as is. Sharing is through the relative source code and mock up with the YOUNG50 app being subject to separate development, as appropriate, in each implementing country, in alignment with technical systems and local interpretations of GDPR regulations.

The first version of the App was ready by M38, in keeping with the Grant Agreement. It was presented to the Consortium at the General Assembly meeting in Bilbao in June 2022. The Report on the Deliverable was submitted at Month 49 in order to provide the latest update on the status of the App, following subsequent enhancements.



1. CHARACTERISTICS

The CARDIO50 cardiovascular screening programme represents a novel tool for the implementing partners. The Coordinating Beneficiary deemed it fitting to innovatively enhance the best practice at the local level as part of their contribution to the YOUNG50 project. This prompted the development of a mobile device application to be integrated into the CARDIO50 screening programme in the Local Health Authority (LHA) ULSS6 catchment area.

The YOUNG50 app was developed for those participants invited to a follow-up visit after 6 months, who have committed to improving, in the intervening period, one of the risk factors they presented at the initial screening visit (e.g. unhealthy diet, intake of too many alcohol units, tobacco smoking, physical inactivity, overweight, or high blood pressure). The app enables them to collect and consult their lifestyle data on a regular basis. It serves as a sort of digital diary, facilitating the collection of information and ultimately enabling participants to provide a comprehensive, more accurate picture of the follow-up dynamics. The YOUNG50 app was designed to motivate participants to engage more actively in reducing and eliminating their selected risk factor, empowering them to make changes to their own lifestyle.

The general and specific characteristics to be incorporated into the app development were identified in the early YOUNG50 planning stages.

1.1 GENERAL CHARACTERISTICS

The YOUNG50 app is an institutional, healthcare application not to be confused with other commercial apps available on the market. It was built as a user-friendly tool to engage participants striving to make lifestyle improvements, without becoming burdensome.

The app was designed to be easily transferred and adapted to the other implementing partners, thus incorporating the option of multilingual settings. Having a setting in English also served for demonstrational purposes (considering that English is not one of the YOUNG50 partner languages).

1.2 SPECIFIC CHARACTERISTICS

Since ULSS6 does not have the necessary human resources, it was necessary to outsource app development. The related tender provided specifications for app access, app use and the information to be made available to users through the app.

To fully comply with internal privacy regulations, YOUNG50 app access is through SPID, i.e. the Italian Public Digital Identity System. Participant consent to data processing is also collected at the time of first access.

The app includes a tutorial to walk participants through the available functions. This is particularly helpful at the time of first access to the app and for explaining specific functions or pages.

The app permits data entry on the risk factor participants have committed to improve (fruit and vegetable consumption, number of alcohol units or cigarettes smoked, amount of time spent on physical activity, weight and blood pressure). It also has sections providing proposals for lifestyle improvement, healthy recipes and exercise tutorials. The “Library” section includes a function designed to send users motivational messages encouraging them to make improvements and update their lifestyle status in the app.

The app also incorporates a back office to which authorized health assistants performing the screening have access. Here they can view the information entered by the participant during the follow-up interval. Health assistants can also send messages and questionnaires through the back office to encourage participants to monitor and correct their risk behaviours.

2 APP DEVELOPMENT PATHWAY

2.1 OUTSOURCING THE SERVICE

As indicated above, not having the necessary human resources in house, LHA ULSS6 undertook a tender process to select the most suitable company in terms of the best value for money. The tender was awarded to Openview Srl, a company specializing in information technology and communications.

2.2 COORDINATION OF ACTIVITIES AND THE WORKING GROUP

In order to digitalise this part of the follow-up process and correctly implement the app, a multidisciplinary working group (prevention doctors, cardiologists, health assistants, IT professionals) was set up to support the Coordination team in developing the app. The first step was to define the app specifications, both clinical and technical/technological, to be included in the tender.

Once the app designer had been selected, the subsequent development pathway involved the synergic work of various operating units: a task requiring close coordination. The Innovation and Development Unit (ISO) organized regular programmed meetings with ULSS6's Privacy Office, the DPO, the IT Department, the developer, health assistants, and doctors from the Department of Prevention. The aim of the meetings was to monitor the various aspects of app development and to plan for the future.

ISO together with the IT Department also organized various sessions to test the various app functions, identifying errors and malfunctions, including implementation of innovative features to ensure the app met the needs of participants and Department of Prevention professionals. The app was then officially tested and inspected to ensure it met the requirements laid down in the tender. To facilitate the inspection, a list of characteristics to be tested was drawn up together with a checklist with room for making observations. The tests were used to identify a series of modifications, proposals and additions to make from in both technical/IT terms. From a regulatory standpoint, the overall approach was one of privacy by design.

Besides defining the requirements and overseeing the implementation process, the Working Group subsequently piloted the final app from access to entry of lifestyle data (consumption of fruit and vegetables, number of cigarettes smoked/units of alcohol consumed, and minutes/hours devoted to physical activity etc.), also testing out the questionnaire and message functions through the back office.

2.3 CHALLENGES

One of the greatest challenges to the development of the YOUNG50 app was the Covid-19 pandemic. Isolation, lockdown and the reduction of in-person activities made it very difficult to continue working as a group. Furthermore, during the period of maximum contagion, the work of the Department of Prevention was redirected first to contact tracing, then to vaccination duties. Once the height of the pandemic was over, the Department of Prevention staff were assigned to reorganizing the relaunch of routine healthcare activities. Priority at this stage was, however, given to the resumption of oncological screening programmes.

Another challenging aspect was the revision of the CARDIO50 screening programme by the Veneto Region, entailing a series of modifications to app content in line with new regional guidelines.



3 THE DELIVERABLE

On completion of the Working Group’s planning and analysis activities and their implementation by the supplier, Openview Srl, the first version of the app YOUNG50 was published in June 2022, in accordance with the agreed specifications, the design documentation and the requirements of the Department of Prevention.

3.1 YOUNG50 APP

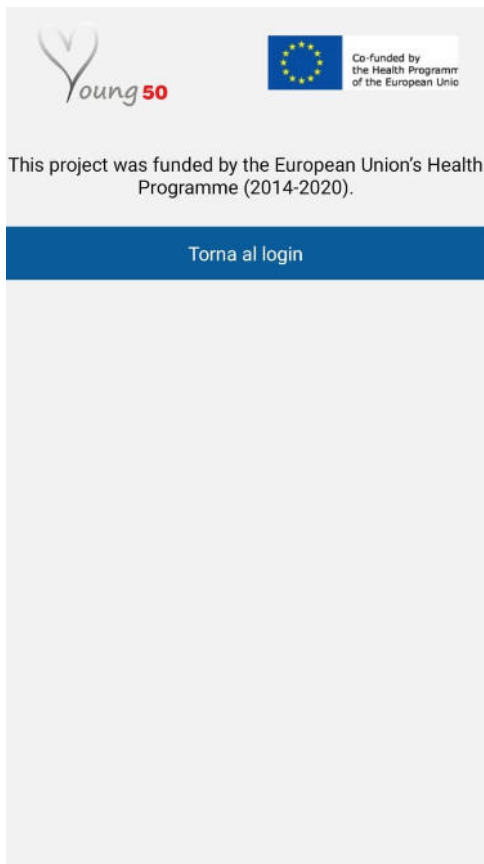
The YOUNG50 app is downloadable from Google Play Store (for Android phones) and from App Store (for iOS devices) for use by the pilot working group. Once CARDIO50 is relaunched it will become downloadable for participants referred for follow up. It contains various sections:

- Home page,
- Recipes,
- Exercises,
- Diary.

These sections are described in more detail below.

HOME PAGE

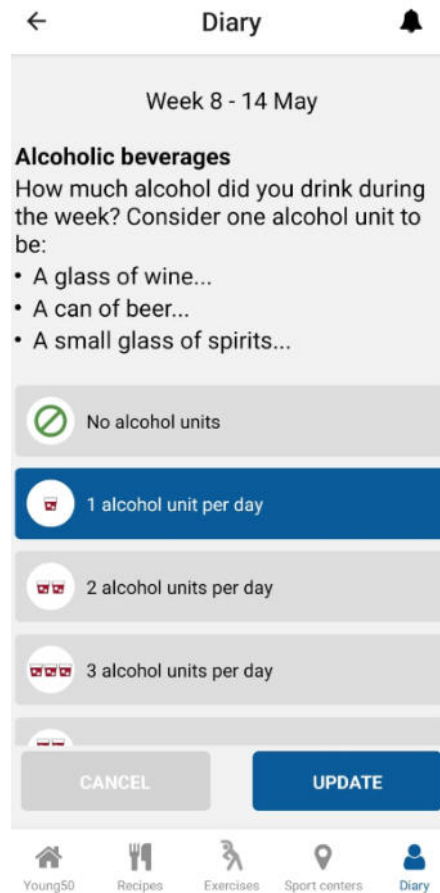
After entering the app, participants land on the home page and are invited to sign ULSS6’s data processing policy statement. This enables them to enter or update their lifestyle data whenever they wish (preferably, at least once per week)



The home page includes a Table dedicated to “My goal”, listing the lifestyle area that the participant has committed to improve during the screening visit

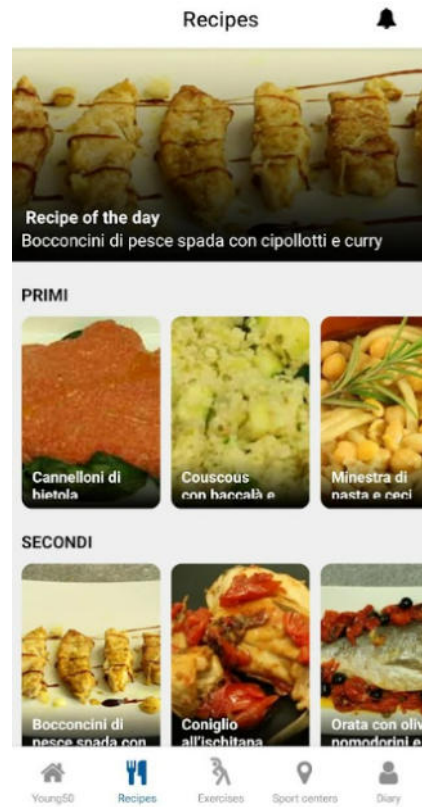


The screenshot below illustrates an example of how weekly consumption of alcohol units is entered.



RECIPES PAGE

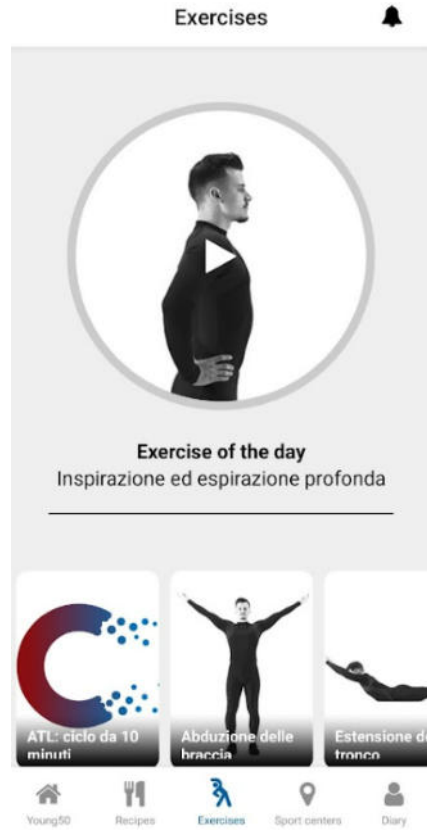
Here the app proposes a series of healthy meals, integrated with a video showing the list of ingredients.



The recipes contained in this section have been taken from an approved nutrition programme recommended for frail patients.

EXERCISES SECTION

This section contains a series of video tutorials with simple exercises that can be performed autonomously.



DIARY SECTION

The Diary section is formed by General Diary, Blood Pressure Diary, Questionnaires, and Personal Data pages. In the Diary, data can be regularly updated on diet, alcohol unit consumption, number of cigarettes smoked, time spent on physical activity, and body mass index. In the “Personal Data” page, participants’ personal data can instead be modified, while participants update blood pressure values in the “Blood pressure diary” on a weekly basis.

Lastly, the questionnaires participants are invited to fill can be completed in the “Questionnaires” section.

Diary

DIARY BLOOD PRESSURE DIARY QUESTIONNAIRES PERSONAL DATA

< Week 8 - 14 May >

Diet

Diet for the week Week 8-14 May. 5 or more portions per day. REFRESH

Week 8-14 May

Alcoholic beverages

Alcoholic drinks for the week Week 8-14 May. No alcohol units. REFRESH

Week 8-14 May

Young50 Recipes Exercises Sport centers Diary

Diary

DIARY BLOOD PRESSURE DIARY QUESTIONNAIRES PERSONAL DATA

PERSONAL DATA

Name: Francesca
Surname: Danesin
Birth date: 18/12/1993
Gender: Female

BODY SIZE

Height: 174 cm
Weight: 79 Kg

LIFESTYLE

Diet: Vegetarian
Consumption of alcohol: Low
Smoking: Non smoker
Physical activity: Moderate

SETTINGS

Italiano English

Review introduction

Change password

Young50 Recipes Exercises Sport centers Diary

Diary

DIARY BLOOD PRESSURE DIARY QUESTIONNAIRES PERSONAL DATA

The blood pressure values of interest for cardiovascular screening are the high ones. For low pressure values it is advisable to contact your doctor.

Wednesday 5 April 2023

Time	SBP	DBP	HR	Arm	Status
12.35	120	80	60	SX	Green
12.35	100	120	60	SX	Red
12.34	120	100	60	SX	Red
12.32	160	70	70	SX	Red

Tuesday 4 April 2023

Time	SBP	DBP	HR	Arm	Status
05.32	100	60	55	SX	Green

Thursday 30 March 2023

+ (Add new entry)

Young50 Recipes Exercises Sport centers Diary

Diary

DIARY BLOOD PRESSURE DIARY QUESTIONNAIRES PERSONAL DATA

New

- Questionario Screening Cardiovascolare (Wednesday 5 April 2023)
- Questionario Screening Cardiovascolare (Wednesday 5 April 2023)

Load more

Completed

- Questionario di gradimento (Wednesday 5 April 2023)
- Questionario Screening Cardiovascolare (Wednesday 5 April 2023)
- Questionario Screening Cardiovascolare (Friday 24 March 2023)

Young50 Recipes Exercises Sport centers Diary



3.2 BACK OFFICE

A designated back office has been developed for the app. Access is given only to authorized health assistants with app-specific credentials. The back office collects all the data participants enter in their own app. In this way, during the follow-up visit, the health assistant can access the back office, search for the participant, and view all the information entered in the app which has been transferred to the back office.

Health assistants can also use the back office to send messages and questionnaires meant to motivate participants striving to improve their chosen risk factor for the onset of cardiovascular diseases.

It is important to stress that the YOUNG50 app is not intended to be a “telemonitoring app”. Thus access to the back office on the part of the health assistants is purely to optimize evaluation, at the time of the follow-up visit, of the pathway taken by the participant during the intervening period, based on regularly collected and thus reliable data.



The screenshot shows a login form with the following elements:

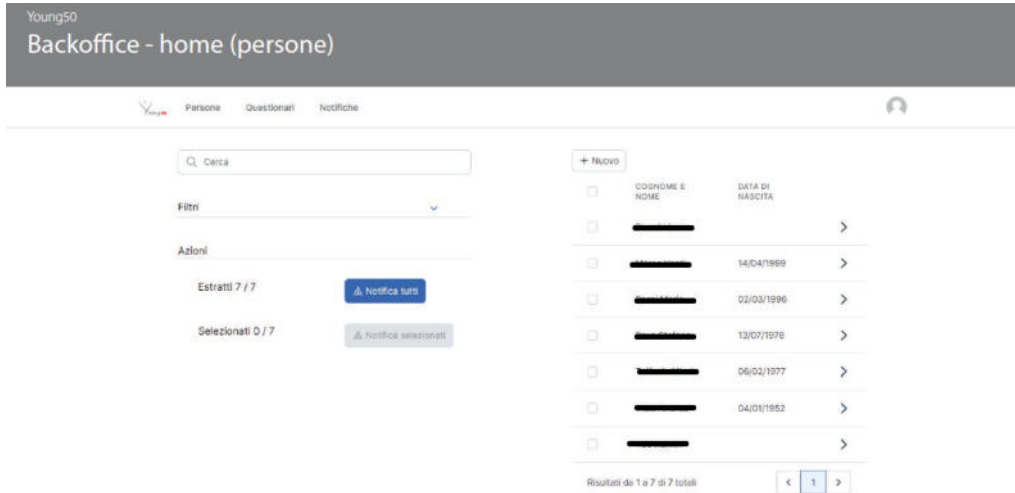
- username field with the value "admin" entered
- Password field with masked characters
- Ricordati il mio nome utente
- Login button
- [Hai dimenticato la password?](#)

The only participants to be registered in the back office are those classified under risk category B2 who agree to use the YOUNG50 to collect data in the time interval between the initial screening encounter and the follow up visit. The back office is divided into three areas:

- Persons
- Questionnaires
- Messages

“PERSONS” SECTION

The health assistant can search for the participant concerned and view some of his/her information, such as risk category. This gives access to the “Participant Record” containing personal data, height, weight etc.



Young50
Backoffice - home (persone)

Personale Questionari Notifiche

Cerca

Filtri

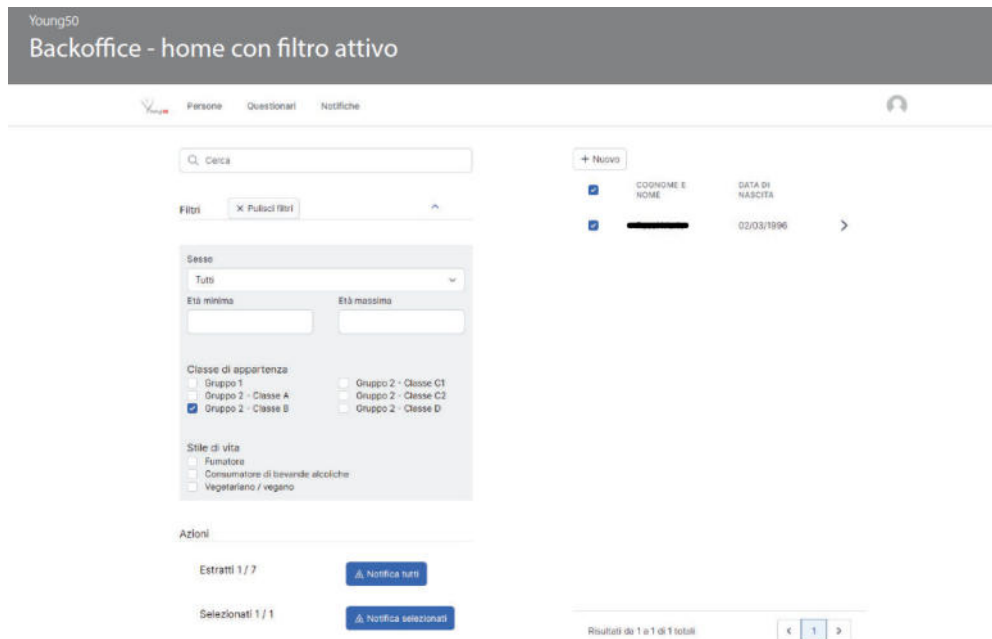
Azioni

Estratti 7 / 7 [Notifica tutti](#)

Selezionati 0 / 7 [Notifica selezionati](#)

COGNOME E NOME	DATA DI NASCITA
[REDACTED]	[REDACTED]
[REDACTED]	14/04/1989
[REDACTED]	02/03/1996
[REDACTED]	13/07/1976
[REDACTED]	06/02/1977
[REDACTED]	04/01/1952
[REDACTED]	[REDACTED]

Risultati da 1 a 7 di 7 totali



Young50
Backoffice - home con filtro attivo

Personale Questionari Notifiche

Cerca

Filtri [X Pulisci filtri](#)

Sesso
Tutto

Età minima Età massima

Classe di appartenenza

- Gruppo 1
- Gruppo 2 - Classe A
- Gruppo 2 - Classe B
- Gruppo 2 - Classe C1
- Gruppo 2 - Classe C2
- Gruppo 2 - Classe D

Stile di vita

- Fumatore
- Consumatore di bevande alcoliche
- Vegetariano / vegano

Azioni

Estratti 1 / 7 [Notifica tutti](#)

Selezionati 1 / 1 [Notifica selezionati](#)

COGNOME E NOME	DATA DI NASCITA
[REDACTED]	02/03/1996

Risultati da 1 a 1 di 1 totali

Young50

Backoffice - dettaglio utente - scheda personale

[Persone](#) | [Questionari](#) | [Notifiche](#)

[Scheda personale](#) | [Biblioteca](#) | [Stile di vita](#) | [Diario pressorio](#)

[Notifica utente](#) | [Esporta scheda](#)

Dati anagrafici

Nome: ██████████
 Cognome: ██████████
 Sesso: M
 Nato il: 02/03/1996
 a: padova
 prov: PD
 CF: ██████████

Recapiti

Residente in: aaaa
 Comune: ssss
 Prov: dddd
 Telefono:
 Email: ██████████

Altezza (cm): 178 | Peso (kg): 72 | BMI: 22,724403484

Classe di appartenenza: Gruppo 2 - Classe B

1ª visita: 05/01/2022 | 2ª visita: 22/01/2022

[Modifica](#)

LIBRARY TAB

In the “Library” section, the health assistant can view the questionnaires sent to the participant and check if they have been filled in. Messages are also sent from here.

Young50

Backoffice - dettaglio utente - biblioteca

[Persone](#) | [Questionari](#) | [Notifiche](#)

[Scheda personale](#) | [Biblioteca](#) | [Stile di vita](#) | [Diario pressorio](#)

[Notifica utente](#) | [Esporta scheda](#)

Questionari inviati

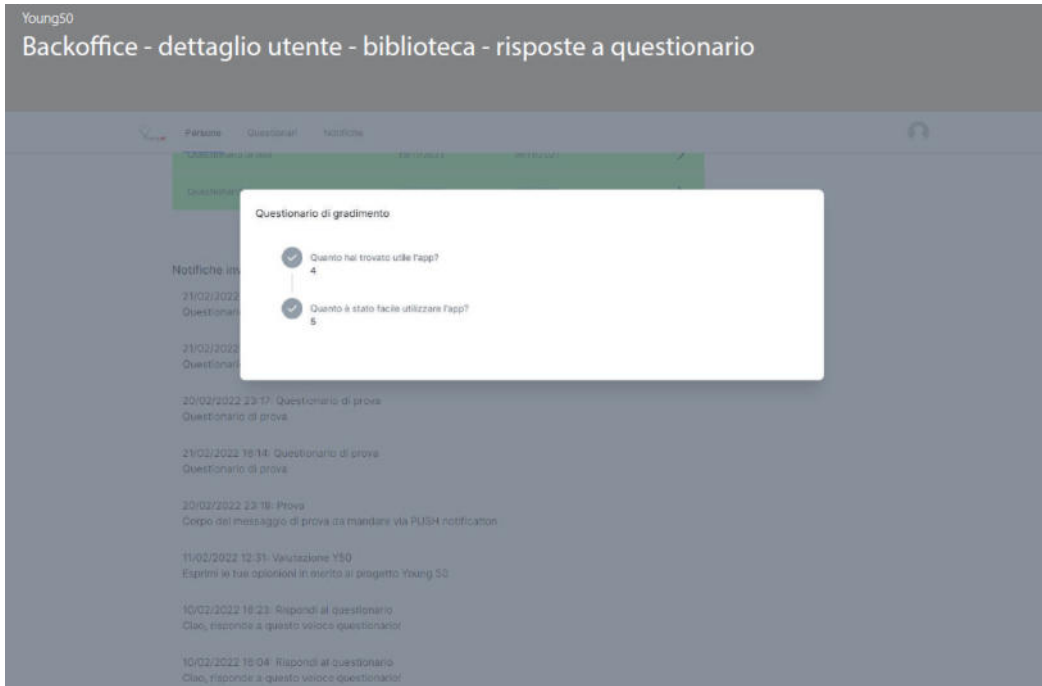
NOME	INVIATO IL	COMPLETATO IL	
Questionario di prova	18/02/2022	21/02/2022	>
Questionario di prova	18/02/2022	18/02/2022	>
Questionario di prova	16/02/2022	18/02/2022	>
Questionario di prova	16/02/2022	16/02/2022	>
Questionario di gradimento	11/02/2022	11/02/2022	>
Questionario di test	16/02/2021	10/02/2021	>
Questionario di test	15/11/2021	16/11/2021	>
Questionario di test	16/11/2021	17/11/2021	>

Notifiche inviate

21/02/2022 16:14: Questionario di prova
 Questionario di prova

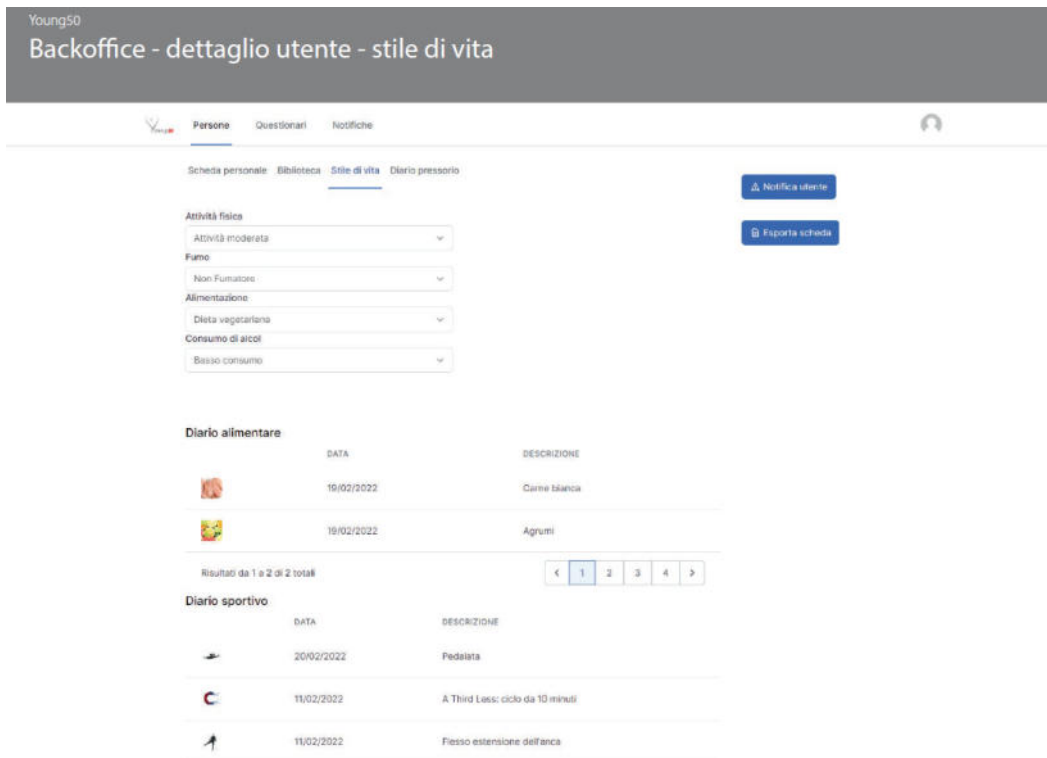
21/02/2022 16:14: Questionario di prova
 Questionario di prova

20/02/2022 23:17: Questionario di prova
 Questionario di prova



“LIFESTYLE” TAB

In the “Lifestyle” section, the health assistant can access the information entered by the participant i.e. data on diet, physical activity, alcohol consumption, smoking etc.. The “Blood Pressure diary” shows information collected on a weekly basis and recorded in the app by the participant.



Young50
Backoffice - dettaglio utente - diario pressorio

Persone Questionari Notifiche

Scheda personale Biblioteca Stile di vita Diario pressorio

DATA E ORA MISURAZIONE	MIN	MAX	BRACCIO	PULSAZIONI / MIN
22/02/2022 10:06	70	120	DX	65
21/02/2022 16:11	75	135	DX	65
21/02/2022 16:03	10	100	DX	20
19/02/2022 13:00	2	2	DX	2
19/02/2022 12:28	4	4	DX	44
19/02/2022 11:51	2	2	DX	6
19/02/2022 11:30	1	2	DX	20
19/02/2022 11:30	1	2	DX	1
19/02/2022 11:26	1	2	DX	
17/02/2022 18:30	11	11	DX	11

Notifica utente
Esporta scheda

Risultati da 1 a 10 di 19 totali

In order to interact with the user, the health assistant is able to send messages or questionnaires. This can be done by the health professional in real time or the transfer can be programmed.
The health assistant is able to prepare new questionnaires to send to participants.

Young50
Backoffice - notifica utente/i selezionato/i

Persone Questionari Notifiche

Utenti selezionati per l'invio: 1

Scegli la notifica:

- BENVENUTO SU Y50
- Prova
- Questionario di prova
- Rispondi al questionario
- Valutazione Y50

QUESTIONNAIRES SECTION

Young50
Backoffice - Questionari (elenco modelli)

Persone Questionari Notifiche

Modelli + Nuovo

NOME	
Prova 2	>
Questionario di gradimento	>
Questionario di Nicola	>
Questionario di prova	>
Questionario di test	>
Questionario di test 2	>

Risultati da 1 a 6 di 6 totali < 1 >

Risultati aggregati

NOME	
Prova 2	>
Questionario di gradimento	>
Questionario di test	>

Young50
Backoffice - Questionari (modifica modello)

Persone Questionari Notifiche

Aggiungi elemento

- Checklist checklist ✕
 - primo
 - secondo
- Campo data date ✕

Campo data
- Caption caption ✕
- Numero number ✕

Inserisci un Numero
- Select select ✕

▼
- Rating rating ✕

★★★★★
- Testo text ✕

Inserisci un Testo

Nome del questionario
Questionario di prova

Abilita per risultati aggregati

Salva

Young50 Backoffice - Questionari (visualizza risultati aggregati)

Personale Questionari Notifiche

Numero di questionari inviati: 1

Quanto hai trovato utile l'app?:

Valore medio: 4

Quanto è stato facile utilizzare l'app?:

Valore medio: 5

MESSAGES SECTION

Young50 Backoffice - Notifiche (elenco modelli)

Personale Questionari Notifiche

Notifiche manuali

+ Nuova

NOTIFICA

Benvenuto su Y50



Prova



Questionario di prova



Rispondi al questionario



Valutazione Y50



Risultati da 1 a 5 di 5 totali



Notifiche automatiche

NOTIFICA

50 Compleanno



Young50 Backoffice - Notifiche (modifica modello)

Personale Questionari Notifiche

Titolo

Questionario di prova

Body

Questionario di prova

Max: 500 caratteri

Questionario

Questionario di prova

Attiva

Salva

4. PRIVACY

LHA ULSS6 adopted a privacy by design approach to the definition and assessment of the processing of personal data recorded through the app, of which ULSS6 is Controller. In this respect, the pathway was critically analysed, in an endeavour to combine GDPR and specific local requirements, the General Regulations on data protection, and national directives.

This activity was particularly burdensome but was necessary to guarantee a high level of data security for CARDIO50 participants.

The following activities were performed:

- Risk analysis: identification and implementation of technical and organizational security measures to prevent and mitigate data processing risks
- Assessment of the impact and probability of risk occurrence.

This work led to the performance of a Data Protection Impact Assessment (DPIA).

Besides the measures implemented at the server, infrastructure and data encryption level, several technical measures were integrated into the app and back office:

App:

- to guarantee data integrity, ULSS6 participants must access the app via the Italian Public Digital Identity System (SPID). In the other implementing countries, who are currently evaluating implementation of the app, this will depend on local regulations;
- at the time of access, participants must inspect the privacy statement and consent to data processing by ULSS6. The name of the participant and their acceptance of the privacy statement is stored in a specially prepared table in the database.

Back office:

- health assistants are prevented from modifying, altering, or downloading the data, in compliance with GDPR;
- health assistants are prevented from viewing individual responses to the satisfaction questionnaires completed by participants. The recorded data are stored as aggregated, anonymized data;
- adequate profiling has been defined for those persons who have access to the back office: access is permitted only to health professionals appropriately selected by the Department of Prevention and authorized to use the Lightweight Directory Access Protocol;
- system administrators who perform maintenance work on the application have been identified and given the necessary authorizations.

In addition, the supplier, Openview Srl, has been appointed as a Data Processor for ULSS6 and has signed a contract to this effect, certifying that they possess the necessary privacy requirements. The IT Department has inspected the protocols for data protection and encryption in order to ensure data confidentiality and integrity.



CONCLUSIONS

The YOUNG50 app was developed with a view to:

- optimizing the CARDIO50 and subsequently the YOUNG50 follow-up process, which is instrumental in assessing the effectiveness of the preventive action;
- innovatively enhance the ongoing CARDIO50 screening process in Italy, by
 - fostering the collection of quality data,
 - motivating participants to reduce the cardiovascular risk factor identified at the first visit,
 - empowering them to make changes to their own lifestyle.

The app is fully operational and its functions are consistent with the CARDIO50 procedure and with the specifications laid down in the planning documents and related tender. Nonetheless, it is envisaged to make further improvements and revisions. These updates will depend both on future developments implemented by the Veneto Region with respect to the CARDIO50 procedure, and also on the need to improve and fine tune various aspects of the app once its use becomes more widespread, with a view to optimizing the user experience.

Lastly, a new working group has been formed to periodically review and update the app with the aim of providing users with new content on exercises, recipes and other helpful, targeted information in order to engage the user as far as possible.

