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mHEALTH-AD

Training program for enhancing the adoption of mobile health technologies by persons with mild-dementia

DETA 2 Module 1: mHealth for tracking and feedback

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DESIGNED EXPERIENTIAL TRAINING ACTIVITY 2_mHealth for tracking and feedback.

Objectives:

DETA 2 mHealth for tracking and feedback presents solutions that not only provide health indicators related information, but they allow a follow up of that information while sending feedback that help to interpret the information and possible actions to be done subsequently. Some of the applications of these solutions could help trainees to enhance their sleeping, physical activity, emotions, mood, sensorial capacity, etc.

DETA 2 is designed including Group Dynamics and discussing why these mHEALTH solutions are useful for PWD and which roles and interactions can be settled between PWD and other stakeholders. DETA 2 also aims to inform about affordable mHealth technologies classified by health problems and guidelines for their use and personalized self-assessment of each PWD on their health status. DETA 2 offers experimenting the use of, at least, one mHealth solution and share the health data and experiences with other persons, like caregivers, health professionals, etc., along the training the Digital Serious Game.

PWD will be involved in the training activities directly, also in the empowerment and experiential approaches PWD will have increased health self-management and digital skills, as well as other transversal skills.

Participants & roles:

- PWD: 5 persons
- Caregivers:
    - 5 formal caregivers
    - 5 informal caregivers

Competences:

- Knowledge about mHealth in general, and physiological and psychological parameters
- Understanding how to measure physiological and psychological parameters with mHealth technologies
- Ability to apply mHealth technologies for measuring purposes

Training contents:

- What are tracking and monitoring systems? (Topic 2 from PR 3)
- Getting a first understanding of tracking and monitoring systems: What types of systems are available? What are the needs and expectations of PwD and caregivers from tracking and monitoring systems?
- Improvement of Self-Management and Empowerment (Cross-cutting topic from PR 3)
- To Get to know different Mobile Health Solutions for tracking and monitoring systems (Cross-cutting topic from PR 3)

Duration of the session: 8 hours

- Face to face session: 5 hours 10 minutes

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- Online session: 1 hour

Transversal training:

- Digital skills
- Social skills
- Self-Management
- Ability to teamwork
- Skills to adapt theoretical knowledge into practice

Methodology:

- Active and participative
- Face to face training:
  - Dialogue
  - Presentations
  - Teamwork
  - Practical activities (Use of different mHealth technologies)
- Online training:
  - Videos
  - Use of different mHealth technologies

Training materials:

- Face to face sessions:
  - PowerPoint presentations
  - Survey
  - List of tracking and monitoring systems
  - tracking and monitoring systems **for presentation**
  - **Videos**
- **Online sessions:**
  - **Videos**
  - tracking and monitoring systems **(e.g. GPS tracking devices)**

Organizational and technical requirement:

- Computer
- Beamer
- mHealth technology
- Room

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- Documents/ training materials
- Sound system

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Table of actions

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FACE2FACE 1.1 SESSION: GUIDELINES, DURATION, AND TOOLS

Action 1. Introduction

- Welcome and Objectives of the session, including learning objectives, activities, and planning.
- Get to know each other

Duration: 10 minutes

Action 1.1 What is a tracking and monitoring systems?

The trainer explains to the audience that tracking and monitoring systems collect a range of data like movement, temperature, behavioral and sleep patterns, and more, and they learn the daily habits of people through the help of motion sensors and alerts providing caregivers and medical professionals with important insights into a person's health and daily life and times of need or irregular patterns.

In this action the trainer collects information from the participants about their knowledge and/or experience in the field of tracking and monitoring systems and their expectations from these systems. To get meaningful and useful results from this discussion, it would be constructive to explain that some of these systems function synchronously processing and transmitting real-time information, while some others operate asynchronously collecting and storing data to be used later. The trainer could list the 6 basic types of systems in order to usher the discussion within the scope, e.g.:

- Voice-activated services
- Movement sensors
- Video monitoring
- Personal emergency response systems
- Medical monitoring
- Comprehensive artificial intelligence home systems.

The trainer can demonstrate one or two examples of such systems to make it clear for the audience what is meant specifically by tracking and monitoring systems. The demonstration can be done by playing an informative video or bringing in a tracking device to the training room and displaying its operation or displaying the function of a smart phone application.

Duration: 10 minutes

Action 1.2 What do elderly tracking and monitoring systems do?

In this part of the action the trainer references the innovations such as robotics, sensors, artificial intelligence, tracking & monitoring, and at-home tests, that could help people living at home with dementia. Some of these innovations will continuously assess physical and mental wellbeing, alerting a person's medical team of any potential problems at an early stage.

The trainer illuminates that some innovations such as robotics may seem like something from the future but robotic devices that interact with people living with dementia and alert them to safety

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risks - such as a cooker left on or a spilt liquid on the floor- or artificial intelligence that flags any unexpected changes in walking pattern that might suggest a patient is at risk, are already available.

It could be effectively instructive for the trainer to name a few sensors that could allow researchers to monitor the vital signs of PwD such as blood pressure, heart rate and body temperature in their homes and at-home test for common infections that can be sent immediately to a person's GP with the benefit from the latest developments in AI, smartphone technology and social robotics.

The trainer could articulate the safety aspect of the tracking and monitoring systems and explains how GPS tracking -as the most common form of tracking and monitoring system- that can help keeping PwD safe. The trainer could point out that GPS trackers come in many forms and can be so small that people wear them easily throughout the day, allowing caregivers to know exactly where they are. The participants are informed about some of those systems can be “wearable” such as a shoe sole and they could be asked what type of systems they would be willing to use.

Duration: 15 minutes

Break 10 minutes

Action 2. Concept

Action 2.1 Tracking and monitoring systems for safety

The trainer opens this session by explaining the two main terms of this training. The trainer expresses “monitoring” as the process of continually collecting data points on each item, system or person and “tracking” as the process of looking at the data that is input into an action and the results that are issued, including the timing detail.

There are countless different technologies available that can support PWD and their caregivers. This unit focuses on two aspects: monitoring of PWD and safety. There are, of course, overlaps meaning that a single device can be used to monitor a person and thus provide safety for the person itself or for their relatives. Therefore, it is not necessary to distinguish between those two domains of fields.

Duration: 10 minutes

Action. 2.1.1 What types of systems are available?

To provide information to the participants on available technologies for monitoring and safety, several devices are introduced. The trainers can use templates and/or videos to illustrate how these devices work and to give the participants a better understanding of them.

- Fall detection
- Monitoring of health data
- Movements sensors (cameras, floor sensors, etc.)
- Emergency call systems
- Flood sensors
- Bed leaving sensor mat
- Body temperature, movement and sleep sensors

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- Door and window sensors
- Glass break sensors
- Camera systems
- Audio sensors
- Monoxide sensors
- Room temperature sensors
- Floor sensors

Duration: 15 minutes

Action 2.2 What are the needs and expectations of PwD and caregivers from tracking and monitoring?

In this action, the possible problems and concerns will be discussed. This is an important part because it signals that the participants are taken seriously with their concerns. The aim is to maintain the participants to a critical basic attitude about the technologies by making it clear that there are potential disadvantages.

At first, the trainer conveys the participants space to express their concerns about the devices. To visualize the statements a mind map gets created. To do so several methods can be used, like a mind map for each device/ type of technology that visualizes potential concerns of the users (see list below).

For this purpose, index cards are distributed to the participants, on which everyone writes down their concerns. Afterward, the participants fold the index cards, and the trainer collects them in a container. Now the trainer opens each sheet in turn and tries to categorize the statements within the mind map. The group of participants discusses an appropriate term for each category.

Duration: 15 minutes

Break 10 minutes

In this part of the action the trainer presents some of the most common issues, such like:

- Data protection
- General technical knowledge
- Updates
- Insurance
- Battery runtime
- Ethical approval
- Inaccuracy

These topics are addressed within the presentation and debate which problems could occur here. It's important to present the topics as pictorially as possible, and topics that affect the devices should be presented with them as much as possible.

For example, in the case of battery runtime, it should be shown that there are reminders to recharge the watch, so the device is always ready for use. And also that GPS devices rely upon receiving signals from at least four satellites. If they connect with only three, the positioning is not fully accurate. Problems can occur when obstacles, such as walls, buildings, skyscrapers, and trees obstruct a signal. The goal is to work through the problems with the participants and use their

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ideas for solution finding. Through the process of discussion, the participants will be more qualified to deal with a problem that could arise, by themselves. This way of thinking manifests itself in the participants and thus facilitates the handling of the device in everyday life. Considering that not all problems can be discussed in this action, this is of great importance.

Duration: 15 minutes

Action 2.2.1 Selection criteria for tracking and monitoring systems

This action invites the participants investigate which technology suits them best to address specific personal needs. The desired result of this action is to help the participants to choose a method/device that can best be integrated into their daily lives. This attempt through the active involvement of the PwD and their caregiver(s) in this action. And allows a better overview of the devices and a more targeted evaluation.

In this part of the action, the PwD and their caregiver(s) receive two to three (depending on the trainer's evaluation of the course so far) templates of technologies and a blank template. These templates roughly represent the information about the devices and contain information like:

- Name
- Cost, including information on potential subscription fees
- Description of the device and additional information (e.g., battery runtime, GPS-tracking range, etc.)
- Information on where it can be purchased.

Duration: 10 minutes

2.2.2 Best methods for tracking and monitoring elderly remotely

In this part, it mainly wants the participants to discuss with each other the different devices. The purpose is to make the participants think more intensively about the devices to also consider aspects not previously covered.

In the following action, each participant presents their pro and con list of the devices. Then the trainer should go through the different devices one by one and instruct that everyone can comment on each device. The trainer summarizes the pro and con comments in writing (e.g., on a whiteboard).

The next action is the open exchange round, here the previous individual reflection is addressed. The exchange is led by the trainer, here the questions get to address one by one. Each participant has the opportunity to express his opinions, this will lead to a group discussion that the trainer moderates.

The trainer explains how the available tools for remote monitoring elderly parents, provide numerous benefits beyond helping individuals age at home. These include:

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- Early detection of cognitive and medical health issues
- Peace of mind for caregivers and their loved ones
- Heightened home security and monitoring of safety issues, such as room temperature spikes or drops
- Reduced healthcare costs
- More opportunity to connect with loved ones further away.

Duration: 20 minutes

Break: 10 minutes

Action 2.3 How GPS tracking keeps people with dementia safe?

In this part, the trainer explains that wandering is a common behavior in patients with Alzheimer's disease or other forms of dementia. While walking is not a problem in itself – it can help to relieve stress and boredom and is a good exercise, people with dementia often have problems with orientation and memory, which can make it hard for them to find their way home.

The term "wandering" suggests that the person is walking without a purpose, when in fact they will often have a reason for it. In any case, once a person begins to show signs of such behavior, they are at high-risk of wandering away or getting lost even in familiar places, which can be very distressing for the caregiver, and dangerous for the individual.

The trainer further explains how walking or moving about can be made safer by using locating or tracking devices or GPS trackers and how these devices follow a person's movements and help identify their location. He should make it clear that no device or system can guarantee that a person with dementia will not get lost or will be found, but using one may keep them safer, thus preventing emergencies and dangerous situations. by providing another layer of safety for dementia patients.

Duration: 10 minutes

What to know about tracking devices for dementia patients?

The trainer explains to the participants how a global positioning system, or GPS, transmits radio signals from satellites to electronic receivers in a device to identify the location of a person wearing it. The trainer briefly demonstrates how the receiver calculates its position using this information by triangulation and also explains that while tracking typically involves GPS, some devices also rely on internet, cellular, or radio technology.

These devices needed to be charged to be able to function and they would require updates in time.

Apart from the benefits, the downsides of these tools should also be presented, such as a misguided safety, overly relying on the device and checking in with the person with dementia less frequently, inaccuracy caused by physical obstacles, etc. The participants should be explained that they should encourage their senior loved one to stick to their usual routine and not venture out into new areas or engage in activities that they wouldn't do without a GPS tracking device.

Duration: 20 minutes

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Ethical considerations

The topic of privacy should also be discussed which can become a source of disagreement since the device will be tracking and monitoring the wearer at all times. The usage of GPS trackers represents a loss of independence and privacy. The trainer suggests to the participants to have a conversation with their loved one before purchasing a GPS tracker to ensure that they are on the same page as far as how a GPS tracker can be helpful and the circumstances in which they will use it to find their location – for instance, when they've been out for longer than expected and you can't reach them on their phone. Caregivers should assure their loved ones that the goal is not to invade their privacy but simply to ensure that they can maintain their independence while remaining safe.

The trainer should discuss these issues with the participants and encourage them to include the person with dementia in the discussion. Some of the questions to ask the participants to help them consider whether a locating device is right for the person:

- During their life, what value has the person placed on their freedom and independence versus their safety and security?
- How do these values influence the decision to use a locating device?
- What effect, if any, will there be on personal dignity? How important is this?
- At what point would it be agreeable to start using a locating device?
- Are there legal issues to consider if he is no longer able to have input into the decision?

Duration: 20 minutes

Break: 10 minutes

Action 2.3.1 Wearable GPS trackers for dementia patients

In this part, GPS trackers for the elderly are presented, from wearable watches to tags that can be attached to a keychain or to a person's clothing. Main functionalities are presented, like built-in buttons that enable seniors to access emergency services or contact their caregivers, essentially functioning as medical alert systems and GPS trackers in one. The trainer explains that GPS trackers with built-in medical alerts and two-way communication also offer the comfort of knowing that a caregiver can remain connected with the loved one even in an emergency.

The topic of GPS trackers getting lost, or malfunctioning should be discussed with participants. The trainer explains, that if a person removes the tracking device, caregivers won't receive accurate location data. For this reason, it's important to choose a device that's less likely to be removed or lost, such as a wearable device.

The trainer presents the main factors to consider when buying a GPS tracker for a senior:

- Type of device
- Monthly fees
- Additional features
- GPS capabilities

Simple and easy-to-hide GPS trackers for dementia.

The trainer presents the main types of locally available GPS wearable devices (pendants, bands, watches, soles, keychain devices, conventional GPS devices. The key features, like battery life, real

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time location, monthly plans, language support, SOS buttons, fall detection, heart monitoring, etc. should be discussed as well as pros and cons list for each device type.

Best-selling dementia trackers in the market

The best-selling dementia trackers on local e-commerce operators or other relevant places are presented, for example three most popular of each device type, to make the buying selection easier. An overview table or list can be prepared with the main features compared.

Other technologies to keep the loved ones safe.

In this part, the trainer explains that GPS trackers for dementia patients have many benefits, however, they are not the only way caregivers can utilize technology to care for a senior with dementia.

The following technologies that can be considered should be presented:

- Dementia-friendly cell phones
- Apps designed just for seniors with dementia.

Duration: 20 minutes

Action 2.3.2 Improvement of self-management and empowerment

Dementia can already cause changes in daily life at an early stage and while it progresses, PWD are confronted with further challenges regarding health and personal independence. In this context, the topic of self-management and creating useful routines might be relevant for PWD, relatives and caregivers. Here, mHealth solutions can also be a supporting element to strengthen physical and mental health.

The aim of this activity is to explore the concept of self-management in the context of mHealth solutions in theoretical and practical ways. As patients and their relatives face different challenges in daily life, both should engage in this topic. The action will consist of three different parts:

1. *Concept of Self-Management*

In this action, the trainer explains that “Self-management” can be defined as an ‘individual’s ability to manage the symptoms, treatment, physical and psychosocial consequences, and lifestyle changes inherent in living with her/his chronic condition.

The trainer rationalizes that offering suitable interventions to help people with early-stage dementia to emphasize managing and living well with self-management, could delay admission to residential care and add to the cost-effectiveness of services.

The trainer highlights the fact that self-management focuses on managing **life with dementia**, rather than managing the dementia itself by emphasizing the “self” and using elements of person-centered care.

Duration: 15 minutes

Break: 10 minutes

2. Self-Management Approaches

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The trainer enlightens how self-management approaches provide benefits for PwD in terms of improved knowledge, self-efficacy and aspects of health status and presents the fact that assisting people to become more knowledgeable about and to develop basic skills in managing their health condition could result in physical and psychological benefits.

At this point self-management approaches such as support groups, psychotherapy groups, goal-oriented rehabilitation and early-stage dyadic interventions are presented to the participants and their benefits such as developing self-management skills to manage the present and future impact of the condition, identify and implement memory management strategies and plan ahead to take control of legal, financial and health issues, are explained.

3. Discussing Individual Self-Management routine for tracking and monitoring for safety (Practical Part)

The trainer asks the participants if they have used/are using tracking and monitoring devices and asks the ones who answer as "Yes" to tell their impressions and if and how these devices have helped their self-management. Then the trainer asks the participants who answer as "No" what their opinions are of the involvement of the participants with devices. If none of the participants have with these devices, then the trainer asks them what benefits would they experience if a system could always tell them and their caregivers where they are at any moment? If they would like to be found at any moment?

Duration: 15 minutes

Action 3. Tracking and monitoring systems available in the market

With the empty template, the participants are supposed to research one device and fill in the template with that information. When the participants finish with this task, they should create a personal pros and cons list of the different devices to use the devices themselves in everyday life.

The first action initiates the individual reflection. The participants receive a sheet with questions for final evaluation and should serve as a guide for the later decision on a device.

- What do you hope to achieve with the usage of a tracking & monitoring system?
- Which device did you personally like best? What is the reason?
- Which device did you like the least? What is the reason?
- In your opinion, what should you pay particular attention to when you're buying a tracking/ monitoring device?

The trainer presents a repertoire of tracking and monitoring devices and displays complementary videos.

How does GPS work?
Click here for the video.

General tips for the safety of persons with dementia.
Click here for the video.

GPS Trackers explained.
Click here for the video.

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Top 10 GPS trackers for elderly.
Click here for the video.

Duration: 30 minutes

Action 4. Conclusion

The trainer summarizes the content of the session and tries to clarify possible doubts and questions. After that, a short summary of the training program is given. Each trainer asks for feedback for the training program, e.g., with an App such as Kahoot!

Duration: 10 minutes

Action 5. Home activities

Activity to be done on your own at home to practice the training contents.

Please reflect on today at home and ask yourself the following questions:

- Action 1.1: Please write down what you hope to achieve with the usage of a tracking and monitoring system.
- Action 1.2: Please write down which device you personally liked the best. What is the reason?
- Action 1.3: Please write down which device you liked the least. What is the reason?
- Action 1.4: Please write down what you should pay particular attention when you're buying a tracking system.

Duration: 10 minutes

Action 6. Recommendations for trainers

- It is important to make the participants feel comfortable both physically and emotionally.
- The participants should be ensured that their opinions are valuable and by attending this session they will go back home with some earnings, and they will have contributed to the studies done in the field to help other PwD as well.
- The trainer should make it clear that the encounter is not a "test" but rather a search for information to help the PwD.
- The trainer should bear in mind that the participants may need some cold and/or warm drinks, use the toilette (frequently)
- The trainer should spend her/his time with the participants during the breaks to address them more personally and also introducing herself/himself as a “server” not an authority to the participants. The more the participants perceive the trainer as a human being the more they will open up, contribute, and also receive.
- The trainer must speak distinctly and at a natural rate of speed. She/he should resist the temptation to speak loudly.

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- The trainer should acknowledge when responses are correct.
- If the participant struggles for a word, the trainer should gently and patiently aid.
- The trainer is advised to use simple, direct wording and pose one question, give one instruction, or express one statement at a time.
- The trainer should keep in mind that many older people have hearing or vision problems, which can add to their confusion, and sometimes they don't hear or sometimes they hear but does not understand, so the trainer should rephrase the statement using different words.
- Although open-ended questions are advisable in most practical activities, patients with cognitive impairments often have difficulty coping with them. Therefore, the trainer should consider using a yes-or-no or multiple-choice format.

END OF DAY

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