

ICT AND ENVIRONMENTAL SUPPORT FOR PATIENTS WITH FRAILTY SYNDROME: CAREWELL PROJECT*, FOCUS PROJECT** AND SUNFRAIL PROJECT***

WSPARCIE ICT I ŚRODOWISKOWE DLA PACJENTÓW Z ZESPOŁEM SŁABOŚCI: PROJEKT CAREWELL, PROJEKT FOCUS I PROJEKT SUNFRAIL

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A – przygotowanie projektu badania | study design, **B** – zbieranie danych | data collection, **C** – analiza statystyczna | statistical analysis, **D** – interpretacja danych | interpretation of data, **E** – przygotowanie maszynopisu | manuscript preparation, **F** – opracowanie piśmiennictwa | literature review, **G** – pozyskanie funduszy | sourcing of funding

SUMMARY

Maintaining wellbeing and independence by elderly people results from implementing the rules of “successful aging”, based on activity and participation in professional and social life, as well promotion of healthy lifestyle. Increasingly greater importance is attributed to frailty syndrome among patients of old age. These patients are characterized by increased sensitivity to stimuli, impaired ability to cope with inner and environmental stress-inducing factors, and they also have limited ability to maintain the state of physiological and psychosocial homeostasis. In such cases it is necessary to provide the patients with integrated care based on the support of the environment and the latest technology. Providing the residents of Lower Silesian Province with high quality of life, adjusting social services to residents' needs, and social integration alone are compliant with The Strategy of Social Integration in Lower Silesia. For that reason, supporting such patients with technology in Lower Silesia was started with the CareWell and WRP® pilot projects. The use of the latest technologies requires a social campaign, media-distributed information, and awakening social interest or even a trend related to their use. It will allow the refining of new services, reduce costs and improve safety for people. Instead of costly specialist care, elderly patients will receive individualized care located within the environment, which will be less costly but more intensive. The FOCUS project deals with reducing the frailty syndrome load in the population of elderly

people in Europe, taking note of enhancing the environmental support. The purpose of the SUNFRAIL project is to improve the identification, prevention and management of frailty, and care of multimorbidity by regional centers and institutions in EU countries of people aged 65 years and over living in the local community.

KEYWORDS: frailty, Carewell project, Focus project, SUNFRAIL project

STRESZCZENIE

Zachowania dobrostanu i samodzielności przez osoby starsze wynika z wdrażania zasad „dobrego starzenia się” opartego na aktywności i uczestnictwie w życiu zawodowym i społecznym oraz promocji zdrowego stylu życia. Coraz większe znaczenie przypisuje się rozpowszechnieniu zespołu słabości wśród pacjentów w wieku podeszłym. Pacjenci ci charakteryzują się zwiększoną wrażliwością na bodźce, upośledzoną zdolnością do radzenia sobie z wewnętrznymi i środowiskowymi czynnikami stresogennymi, a także posiadają ograniczoną zdolność do utrzymania stanu fizjologicznej i psychospołecznej homeostazy. W takich przypadkach konieczne jest wsparcie pacjentów opieką zintegrowaną polegającą na wsparciu środowiska oraz najnowszej technologii. Zapewnienie mieszkańcom województwa dolnośląskiego wysokiej jakości życia, dopasowanie usług społecznych do potrzeb mieszkańców oraz sama integracja społeczna są zgodne ze Strategią Integracji Społecznej na Dolnym Śląsku. Dlatego też, na Dolnym Śląsku wsparcie takich pacjentów technologią, zostało zapoczątkowane pilotażem projektu CareWell i WRP®. Zastosowanie nowych technologii wymaga kampanii społecznej, informacji w mediach i wzbudzenia społecznego zaciekawienia, wręcz mody na ich stosowanie. Pozwoli to na doskonalenie nowych usług, obniżenie kosztów i poprawę bezpieczeństwa ludzi. W miejsce kosztownej opieki specjalistycznej pacjenci w wieku podeszłym uzyskują opiekę indywidualizowaną, lokowaną w środowisku, mniej kosztowną lecz bardziej intensywną. Projekt FOCUS zajmuje się zmniejszeniem obciążenia zespołem słabości w populacji osób w wieku podeszłym w Europie z uwzględnieniem wzmocnienia wsparcia środowiskowego. Celem projektu SUNFRAIL jest poprawa identyfikacji, zapobiegania i zarządzania zespołem słabości oraz opieką nad wielochorobowością wśród osób po 65 roku życia mieszkających w społeczności lokalnej przez regionalne ośrodki i instytucje krajów UE.

SŁOWA KLUCZOWE: zespół słabości, projekt CareWell, projekt FOCUS, projekt SUNFRAIL

INTRODUCTION

The pace of aging of the population in Poland and around the world has accelerated rapidly: The number of people over the age of 65 was 261 million in 2004, and this figure will increase to 2 billion, by 2050. This demographic shift will require changes in the planning and delivery of health and social care. Two of the most problematic expressions of population ageing are frailty and multimorbidity.

Frailty Syndrome (FS, Frailty) is a common problem in both Polish and European society. The syndrome is described as a condition of the global loss of the body's physiological reserves, presenting multiple organ nature. This is evidenced by increased sensitivity to stimuli, impaired ability to cope with inner and environmental stress-inducing factors, and also limited ability to maintain the state of physiological and psychosocial homeostasis. It is estimated that frailty syndrome is present in 20–30% of the population of elderly people population above the age of 75, and it drastically increases with age. FS entails increased risk of many adverse health-related results, such as increased susceptibility to acute diseases, falls, disability, dependence on others, hospitalization, institutionalization (e.g. admission to healthcare centers), and increased mortality. However, it should be remembered that early, appropriately earlier implemented diagnostic and treatment proceedings may prevent frailty syndrome, and elderly people with FS at its early stage still have a chance to reverse the unfavorable process

and return to the condition prior to FS. Multimorbidity, the simultaneous presence of two or more chronic diseases in a patient, is much more common in the elderly population.

Studies conducted over the last 20 years have progressively demonstrated the importance of the concurrence of multimorbidity and frailty. This poses new challenges to health services, in terms of skills, resources and organization. Examples of a comprehensive response to the increasing pace of society aging, and rise in the number of elderly people with frailty syndrome and multimorbidity are presented based on the Carewell Project, the FOCUS Project and the SUNFRAIL Project.

CAREWELL PROJECT - SUPPORTING ICT TECHNOLOGY

Frail patient care is an important part of health care, and this is why the CareWell pilot project has been launched in Lower Silesia [1,2]. A new model of integrated TeleCare has been developed with the help of new technology. In 2016, the Marshal's Office of the Lower Silesian Voivodeship co-financed the pilot of the innovative "Assisted Rescue Patient - WRP®" project, which successfully integrates into CareWell care. Assisted Rescue Patient - WRP® (hereinafter WRP®) consists in grouping, in one place, patient data and health needs. This project was launched by the Foun-

dition of the Autumn People in 2015 [3]. After intensive work on the system and its pilot, it is now ready to be implemented.

After the end of the CareWell pilot phase, the project will be continued in a more mature form for a much larger number of patients with complex social and health needs. Through the implementation of the abovementioned projects, telecare services will be available for CHF, COPD, diabetics, hypertension patients, etc., who are of poor health and require social support. The proposed ICT solution is fully in line with the 2020 Development Strategy for the Lower Silesian Voivodeship [3–5]. The health and safety of the inhabitants of Lower Silesia is a fundamental determinant of the quality of life in the region, as well as for the idea of technological support under the CareWell Project. Patients leaving the hospital who require further intensive care may be referred to the TeleCare CareWell system. The Electronic Case Record (ECR), made in the WRP® specific wrist band, will facilitate, for example, the rapid transfer of patient data to the CareWell system.

BRIEF DESCRIPTION OF THE WRP PROJECT

The WRP® wristband is a silicone electronic device designed according to the visualization (Figure 1).



Figure 1. Visualization of the WRP® device

Wristband device

The device is in the form of a stretchable band of varying sizes (diameters) based on the patient's wrist size. In the "watch" part, it has an embedded NFC tag - namely the NTAG216, with 924B of available memory [5]. This is a passive chip powered by a reading device, such as a smartphone or tablet. In the chip, basic patient identification data is recorded, as indicated in the illustration (Figure 2).



Figure 2. Sample patient data

The saved data makes it possible to immediately contact, with the touch of a smartphone or tablet screen (with NFC), the person assigned to them. The ID number encoded in the chip is identical to the number stamped on the outside of the band. The second integral part of the WRP® system is the Database (DB), stored on one of the best Polish servers - home.pl. The data saved therein is HTTPS and SSL protected. The Autumn People Foundation has the necessary DB encryption certificates. This means that the DB is just as safe as electronic banking and is additionally reported to GIODO. The idea of the DB is to provide it with free access to all healthcare services, such as emergency services, hospitals with a special focus on emergency and other medical units using TeleCare, as well as care homes or the police or fire department. The last two institutions would only have access to the master data, without the ability to view the medical data (sensitive). The advantage of such a system is the ability to define precisely, just at the time of receiving the dispatch by the emergency operator, to whom he sends the emergency team. It is enough that an accidental person reporting an accident with a WRP® participant will provide the operator, on his / her request, with the previously described ID number. It is not necessary for the 112 callers to have a smartphone with NFC. All they need is a regular cell phone and a request, from the operator, of ID from the band. WRP® is a simple, cost-effective and unprecedented system to save people's health and lives.

Database

The wristband device is one part of the WRP. Another integral part is the Database - DB, which is located on one of the best Polish servers - home.pl. The information stored therein is protected through HTTPS and SSL protocols. The Autumn People Foundation has the necessary certificates for DB encryption. This means the DB is as safe as, for example, electronic banking. The idea of the DB is to make it available for free to all life and health saving services, such as emergency medical services, hospitals - particularly emergency departments, other medical units, as well as, for example, care homes, police or the fire department. The latter two institutions would gain access only to basic data, without the possibility to review medical information (Figure 2).

Target groups

The main recipients of the new TeleCare services are those at risk of chronic diseases that result in health or life-threatening conditions, as well as those with implants and stimulators and those with physical and mental disabilities (e.g. heart disease, epilepsy, type I diabetes, Alzheimer, etc.). In addition, the recipients may be blind, deaf, deaf, visually impaired, children with at least basic identifying data from 3 to 10 years of age, as well as people of any age who wish to feel safer.

In the future of TeleCare services, there will be provided to the patients who were not included in the pilot

phase of the project. A similar educational approach will be required, as it was in the case of pilot group. The including criteria will be: chronically ill patients, requiring permanent medical care. Our ambition is to provide integrated care in our region for approx. 15,000 patients. Because of the complex criteria of inclusion or exclusion, this process will be implemented for over several years. Integrated care services are considered a key element of the Regional Health and Social Care Plan.

COMPLIANCE WITH THE 2020 DEVELOPMENT STRATEGY OF THE LOWER SILESIA VOIVODSHIP

The proposed ICT solution is fully in line with the Regional Health Strategy and with the technological support provided by the CareWell Project [4]. Those patients leaving the hospital who require further intensive care may be directed to the TeleCare CareWell system using this Electronic Case Record (ECR) designed to facilitate the safe transfer of patient data to the CareWell system. It is according to Priority of Health Protection 5.1.6 - Raising the level of personal, public and health safety including emergency - "The health and safety of the inhabitants of Lower Silesia are the basic determinants of the quality of life in the region" [3].

FOCUS PROJECT - ENVIRONMENTAL SUPPORT

The FOCUS Project (Frailty Management Optimization through EIP AHA Commitments and Utilization of Stakeholders input) is a project funded as a part of the 3rd Health Program. In Poland, the Department of Family Medicine at the Medical University in Wrocław is the Consortium's partner, with Universitat de Valencia (Spain) being the project coordinator. In addition, universities from the Netherlands, Great Britain, Italy and Portugal also participate in the project.

The aim of the project is to reduce frailty syndrome load in the population of elderly people in Europe, through partner support within the European Innovation Partnership for Active Healthy Aging (EIP AHA) consortium, with particular stress on the importance of early diagnostics and care provided for selected subpopulations in old age. The project is aimed at both developing the rules of proceedings in the clinical aspect (guidelines based on scientific evidence), and the social aspect, as well as to further specify the rules of support on the decision-maker and non-government organization (NGO) side.

The FOCUS project is divided into several stages and tasks provided to be completed:

- WP 1 - Project coordination - management of specific project stages and implementation of its results. WP1 tasks also include cooperation with

other partners, providing the subject-related and financial safety of the project, as well as supervision over the timeliness of subsequent task performance. Developing periodic reports, including financial ones.

- WP 2 - Distribution of information about the project and its results - distribution of project results among target groups: patients with frailty syndrome and their carers, healthcare professionals, decision makers, representatives of NGOs, insurance companies, and organizations within EIP AHA.
- WP3 - Assessment of progress at subsequent project stages, and level of completed goals - this includes both internal assessment of correct subsequent project stage course, communication between partners of the performing team, as well as external assessment with the participation of target groups (patients with frailty syndrome and their carers, healthcare professionals, decision makers, representatives of NGOs, insurance companies, organizations within EIP AHA).
- WP4 - Synthesis of science and practical reality - determining the current state of knowledge and performed procedures regarding frailty syndrome within the European Union through the assessment of current literature publications, guidelines and implemented procedures related to frailty syndrome. Another stage includes determining need with regard to frailty syndrome on the part of patients and their carers, healthcare professionals, decision makers, NGO representatives, and insurance companies. Determining the recommendations which will be subjected to synthesis within WP5.
- WP5 - Analysis and development of guidelines - the identification, selection and validation of indicators used for analytical characterization and comparison between different interventions within studies on frailty syndrome as a part of EIP AHA. Analysis of data available as a part of EIP AHA, based on established indicators, as well as within cooperation with patients and their carers, healthcare professionals, decision makers, NGO representatives, and insurance companies. Determining the application possibilities in terms of guidelines developed as a consequence of WP4 realization, and clinical, as well as social predictors of their implementation.
- WP6 - Developing a network and platform of knowledge exchange, design and realization of the cooperation network. The final effect of this task will be to develop a platform of knowledge exchange containing the effects of prior project stages: data development, meta-analysis of literature, indicator groups, guidelines or resources for both patients and their carers, as well as healthcare professionals, decision makers, NGO representatives and insurance companies.

- WP7 – testing the guidelines - service verification, including testing the guidelines in terms of EIPAHA, conducted by the consortium's partners, taking note of feedback from patients and their carers, decision makers, NGO representatives and insurance companies. Estimating the monetary value of the implemented changes through economic analysis [6].

INTERVENTIONS WITHIN WP 7 OF THE FOCUS PROJECT

The Department of Family Medicine at the Medical University in Wrocław is the partner as a part of WP 7. The task of MU in Wrocław will be to create new intervention groups for elderly people with frailty syndrome. Studies will be conducted in the areas of Opolskie and Lower Silesian provinces. The research project will be composed of three stages. In the first stage, the frailty syndrome problem will be presented to patients, and also elderly people (frail or pre-frail) will be qualified to another stage – intervention implementation. 3 intervention groups will be created: nutrition, physical activity, and a nutrition group with physical activity. The patients will perform simple tests of physical and mental efficiency, and measurements will also be taken. With nutrition advisor's help, nutritional recommendations will be prepared, dedicated to elderly people with frailty syndrome. The task of people participating in the studies in the nutrition group will be to improve their diet with products recommended in frailty syndrome, as well as modification of inappropriate nutrition habits. With a physiotherapy specialist's help, sets of exercises will be performed. The task of the study participants from the physical activity group will be to implement prepared training 2 times per week, after prior instructions. The first stage of the intervention will take 3 months, after which measurements and tests from stage 1 will be repeated. The second stage will take another 3 months, after which tests and measurements from the first stage will be repeated.

SUNFRAIL PROJECT – FRAILTY AND MULTIMORBIDITY

SUNFRAIL (SUNFRAIL Reference Sites Network for Prevention and Care of Frailty and Chronic Conditions in the EU) is a 30-month European project which began in May 2015. The project received funding from the EU Health Programme 2014–2020 and brings together 11 partners from six EU Member States, including Poland.

The purpose of the project is to improve the identification, prevention and management of frailty, and care of multimorbidity by regional centers and institutions in EU countries of people aged 65 years and over living in the local community.

These goals are achieved thus:

1. Developing an innovative, integrated model for prevention and management of frailty and care of multimorbidity through the main efficiency, effectiveness and sustainability criteria, and are based on the results of the EC Innovation Partnership on Active and Healthy Aging (EIP-AHA). The model will be multimodal, and the common core will facilitate scaling and adapting to the specificities of different healthcare systems and different socio-cultural contexts [7,8].
2. Validating the model on the basis of existing systems and services to address frailty and multimorbidity, as well as the patient's perceptions, and to express care needs and quality of life.
3. Evaluating the model's takeover / replication potential in various European organizational contexts, and determining the conditions for its sustainability and reproducibility.
4. Disseminating the results with a focus on the strategic decision makers at regional, national and EU levels to support the adoption of effective prevention and management procedures for frailty and care of multimorbidity.

The Polish partner of the SUNFRAIL project is the Department of Geriatrics, Medical University of Lodz. The Clinic's activities began in 2005, when the Department of Geriatrics was established. Currently the clinic provides hospital and ambulatory care for older patients, employs four physicians, two physiotherapists and four doctoral students. The main scientific and didactic activities of the Clinic address prophylactics, physical disability, the role of power and muscle strength in maintaining independence in daily functioning, nutritional status and well-being in the elderly. The Clinic also provides rehabilitation and physiotherapy, nursing and social support.

RESEARCH IN THE PROJECT

The experimental role played by the Polish center participating in the SUNFRAIL project involves knowledge exchange in the field of "good practice" to identify, prevent, and treat multimorbidity, focusing particularly on the prevention and avoidance of hospitalization.

The second important study is the development, validation and testing of the SUNFRAIL Tool for early detection of frailty through the assessment of physical, cognitive, nutritional and psychosocial risk of dysfunction as well as support for the adoption of care pathways [9].

The goal of the experiment is to improve professional procedures by applying a multidisciplinary approach using specific tools. The SUNFRAIL TOOL questionnaire has been validated in terms of comprehensibility and is currently available in five languages: English, Polish, French, Spanish and German. An initial assessment of the applicability of this approach has also been made by representatives of different back-

grounds. Co-operation with the EIP-AHA network, as well as the European Union Geriatric Medicine Society (EUGMS) – a group associated with “Frailty in older persons”, assures scientific support for these newly developed tools and strengthens its international value [8].

CONCLUSIONS

The technology making use of ICT solution is beginning to significantly support patients with frailty syndrome in everyday life, improving the standard of their lives. The fact that pilot results clearly indicate a decrease in the GDS index for patients in the intervention group provides encouragement to implement CareWell and WRP® services, and analysis of user satisfaction shows that people participating in the projects are satisfied and would like to continue using new services and new solutions. On the other hand, WRP® is a simple, very inexpensive system, and yet it still provides unprecedented possibilities for saving human health and life. Of course, the implementation of new technologies requires a social campaign, media-distributed information, and awakening social interest or even a trend related to their use. Awakening this social interest would provide a snowball effect. Whisper marketing would appear, Internet forum boards would be created, and simultaneously sponsors would join the social campaign. All of this will allow the refining of

new services, cut costs, and improve human safety, in order to simply provide them with a product. In order to make them feel safer.

The FOCUS and SUNFRIL projects will facilitate multi-aspect (preventive, diagnostic, treatment, sociological, economic) use of obtained knowledge about frailty syndrome and multimorbidity. The results of the studies will constitute a valuable source of information in the process of developing an identification system for patients with frailty syndrome, rules of cooperations between multi-speciality teams, educational programs for patients and their carers, as well as healthcare and social care professionals. The results of these studies will also constitute a valuable source of information in the development of tools for the evaluation of care quality in the case of patients with frailty syndrome, with analysis of their needs and expectations in relation to somatic, mental, and social fields.

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