

Assistive Technologies along Supply Chains in Health Care and in the Social Services Sector

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Abstract. Health care systems in Austria and Slovenia are currently facing challenges due to scarce resources and demographic change which can be seen especially along the supply chains. The main objective of this paper is to present an option to improve the use of assistive technologies. An extensive literature research for the theoretic part as well as a qualitative survey for the empiric part focusing on short-term care were carried out. Results show that there is a lack of information and training on assistive technologies. As a consequence, their full potential cannot be exploited. Therefore a guideline for nursing consultations was developed. To conclude, both the literature research and the qualitative survey show that assistive technologies have high potentials to improve the supply chains in the health care and social services sector, but there is a lot of information and training on them needed.

Keywords. Assistive technologies, short-term care, supply chain (health care).

1. Introduction

The use of assistive technologies is an opportunity to overcome the current challenges in the health care systems of Austria and Slovenia, such as demographic change, scarce resources and the imminent shortage of nursing professionals. However, there is still a great need for research on assistive technologies and their potentials.

The IMPACT!-project, promoted and assisted by the Operational Programme Slovenia-Austria 2007-2013, is a cross-border cooperation between Slovenia and Austria. The project aims at an advanced technology transfer to improve the situation among health care institutions and the social services sector and focuses mainly on two fields of technologies: Ambient Assisted Living and eco technologies.

The main goal of one work package within the IMPACT!-project is the analysis of the distribution and use of assistive technologies along the supply chains in Austria and Slovenia. Additionally it is also an aim to identify potentials and limits concerning the contribution of knowledge management to an effective hospital management and the identification of potentials and limits concerning these products.

The aim of this paper is to present the results of this work package concerning short-term care in Austria and to provide a guideline for the integration of assistive technologies, which could help to optimise supply chains in the health care and social services sector. The following questions are addressed by this paper:

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- What significance does short-term care have for consulting care-giving family members regarding assistive technologies?
- What options are there for consulting care-giving family members regarding assistive technologies within short-term care?

2. Methods

An extensive literature research for the theoretic part as well as a qualitative survey for the empiric part have been carried out.

Short-term care was chosen as an example for the qualitative analysis. Short-term care is the temporary care of a person who needs care in a nursing home, in order to allow the person who usually looks after him or her to have a rest.

In what follows, a short description is given of the two methods used during the project.

2.1. Literature research

The first method used was an analysis of supply chains, which focused on the transitions between inpatient and outpatient treatment and care as well as short-term care. To do this, a literature research of the homepages of specific organizations, such as ministries and scientific institutions, as well as in the search engine of the Austrian Library Network was conducted. The keywords used in this research are: assistive technologies, short-term care, care-giving family members, supply chain (health care).

2.2. Qualitative survey

In order to refine our results, we also conducted strictly guided interviews with twelve persons, including nursing home managers, care managers and charge nurses in short-term care institutions in Austria. We hoped that the analysis of these interviews could give us insights into the current supply situation concerning the importance of assistive technologies can be done.

The guideline for these interviews was developed in a multi-step procedure. First of all, the authors chose specific topics based on the research issues. In a second step, these topics were converted into adequate questions for the interviews. The last step was to revise these questions and to arrange them into a proper order according to content-related criteria. This resulted in a guideline for the interview on short-term care and assistive technologies in general and in the context of each organization. The following topics were covered: importance of short-term care in Austria, significance of short-term care for care-giving family members, potential of assistive technologies to postpone long-term care, integration of assistive technologies in nursing consultations during short-term care.

Additionally, a questionnaire was prepared and sent by email to the project partners, two Austrian and two Slovenian organizations. This questionnaire was structured similarly to the guideline for the interviews.

3. Results

3.1. Assistive technologies

A quite broad definition describes assistive technologies as “an umbrella term indicating any product or technology-based service that enables people of all ages with activity limitations in their daily life, education, work or leisure” (Andrich 2013: 249) [1]. Another definition according to ISO 9999:2011 limits the scope of assistive technologies to devices, equipment, instruments and software, which is used for or by persons with impairment to health to participate in society, to support, train or measure body functions and activities as well as to prevent further impairments. These products are either designed for special target groups or generally available [2].

A working group of the innovation partnership AAL provides a more precise definition, particularly in relation to ambient assisted living (AAL). According to this, assistive devices are basic, daily products such as visual or walking aids, whereas AAL-systems use AAL-devices with a certain amount of intelligence. They shall communicate and cooperate with other devices, be integrated in the environment, react adequately to the user, the setting and the respective situation and be safe for use [3].

3.2. Integrated health care and supply chains

Integrated health care is the coordinated and networked cooperation of the health care providers [4] to ensure optimal patient care [5].

In general, there are two approaches of integrated health care. First, indication-related models, such as disease management programmes, that focus on a specific disease. Second, population-related models, such as case management, that covers the medical treatment and care of a person [4].

The aims of integrated health care are high quality and efficiency of medical treatment and care as well as a focus on the needs of patients [5]. In order to be accepted by all persons and institutions involved, the benefits of integrated health care have to be evident and a win-win situation has to evolve. The main benefit for patients is the focus on their needs as well as treatment and care which are as short as possible due to reduced waiting periods and the avoidance of multiple examinations. Health care providers can benefit from reduced organisational efforts, a higher efficiency, direct information paths and more effective communication as well as a higher patient satisfaction. Funding agencies can profit from transparency of services, higher customer satisfaction and cost effectiveness, which results from optimised treatment processes [4].

To successfully implement integrated health care, a well-functioning, cross-sectoral cooperation of the involved health care providers is needed. Therefore status and hierarchical thinking has to be overcome [6].

The core of integrated health care is the connection of individual supply chains of service providers in order to form a cross-sectoral and transdisciplinary supply chain a patient needs to be sent through without loss of information and time.

The authors of this paper use the concept of supply chain in the context of treatment and care of patients as the path of a person through health and social facilities. It comprehends all necessary activities for the care and treatment of patients. The supply chain includes preventive procedures, outpatient and inpatient medical treatment, short-term care, rehabilitation and a possible long term care. It is important to take both the objective supply requirements as well as the needs of the individuals into consideration.

There are two types of supply chains: additive supply chains and integrated supply chains. Additive supply chains result randomly from the services of different health care providers and are provided inconsistently. Integrated supply chains, on the contrary, are the result of active efforts of participating institutions to coordinate the services. Also the patients and their relatives are involved in this process in order to create an optimal supply chain [7]. Additive supply chains lead to relatively low quality and long time frame for treatment, whereas integrated supply chains can improve quality.

The analysis and the literature research have shown that there are gaps and problems in supply chains, especially for seniors. At the moment most health care and social services providers have their individual supply chain. These problems lead to reduced quality of treatment especially at the interfaces and increased costs for all relevant actors. Consequently, to improve the quality of patient treatment and care, these supply chains have to be connected and optimised. The connection and matching of the supply chains is an important part of integrated care.

3.3. Short-term care and assistive technologies in Austria and Slovenia

In the present chapter, we turn to present the results of the analyses of the interviews and questionnaires by describing the situation of short-term care in Austria and Slovenia.

Short-term care is of high importance, as it is a great relief for care-giving family members. Most of the interviewed experts in the field of health care and social services from Austria are of the opinion that places offering short-term care are insufficient. This is due to different models of financing and equipment in the federal states as well as to difficulties in requirements planning, because there can be unpredictable idle times. Nonetheless, the available short-term care beds in Austria are well used.

Slovenia presents the following distribution of short-term care. The offer in Slovenia could be improved as there are just a few residential care homes and spas which offer short-term care. The use of assistive technologies is very limited because of lack of information, high costs and the relatively low stage of development of assistive technologies in this country.

According to the interviewed Austrian experts in the field of health care and social services and the Slovenian experts who replied to the questionnaire, assistive technologies have the potential to postpone long term care and can be very important to relieve the pressure on the health care system. However, their usefulness depends on the care level of the individual, because from a certain level onwards, an inpatient long term care is unavoidable. Furthermore, the results of both the interviews and the questionnaires show that there is a lack of knowledge concerning available assistive technologies and their use by relatives.

The interviewed Austrian experts in the field of health care and the social services frequently hold consultations with dependent persons and relatives. These include advice regarding assistive technologies.

Additional services include information afternoons that cover specific care-related topics, a contact point and a café for seniors and relatives. Furthermore, there are additional individual consultations at any time if required.

Nursing consultations cover the following topics. First of all, the care staff analyse the needs of the dependent person in the home environment. This assessment determines whether assistive technologies are needed and in case they are, which ones are suitable. Then the care staff explains how to use assistive technologies to the dependent person and to their relatives and train them.

To conclude, the results of the interviews and the questionnaire demonstrate that information and training on assistive technologies in order to exploit their full potential are needed. A widespread use of assistive technologies may prolong living at home, improves quality of life for the patients as well as reduces costs and therefore reduces burdens for the health care system. Yet, there are a lot of barriers regarding financial, legal, ethical, technical and individual aspects.

3.4. Guideline for the integration of assistive technologies

In order to improve the use of assistive technologies along supply chains in the health care and social services sector, the authors of this paper developed a guideline for the integration of assistive technologies as part of the results of the work package. This guideline is based on the results of the interviews and the questionnaires.

The guideline, which is shown in Table 1, helps nurses to decide, whether assistive technologies are needed or not. This can be analysed during a nursing consultation in a short-term care institution.

Table 1. Guideline for the integration of assistive technologies.

| Guideline for the integration of assistive technologies |
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| Analysis of the existing supply |
| <ul style="list-style-type: none"> • Who gives care (formal, informal)? Are there other persons in the same household or in the neighbourhood who can support the dependent person if it is necessary? • What helpful products are used? Are technical products used as well? Does the care-giving family member know some assistive technologies? • Introduce assistive technologies. |
| Demand analysis of the prospective supply |
| <ul style="list-style-type: none"> • What nursing care level does the person have? How high is the degree of need for care? Is care at home possible (with the help of assistive technologies) or is inpatient care needed? • Which assistive technologies are adequate for the given need? Which assistive technologies enable the person to live independently? Which assistive technologies make nursing easier for the care-giving family member? • Does the technical and architectural infrastructure meet the requirements of the chosen assistive technologies? • Is it possible for the person who is in need of care to operate the product by her-/himself? Is it possible for the care-giving family member to operate the product? • Do the care-giving family member and the person who is in need of care agree with using assistive technologies? |
| Providing information |
| <ul style="list-style-type: none"> • What possibilities for financing exist? • How and where can the products be purchased? • If necessary, purchase the product. • Arrange a meeting for a training. |

4. Discussion

Summing up the results of the analyses done within the work package and those of the conducted interviews, it is to say that there is a lack of information and training on assistive technologies. Therefore, it is not possible to exploit their full, high potential to

improve supply chains in the health care and social services sector. The results show that on the one hand there are a lot of barriers which have to be overcome. On the other hand, there are a lot of potentials to optimize supply chains and to improve quality.

Several limitations concerning the methods of the work package are given, because there were just twelve persons interviewed and the questionnaire has been sent out to four organizations. This is partly due to limited time and partly to scarce financial resources to include more health care professionals. Additionally, the developed guideline could not be tested for the same reasons.

To make sure that every resident of a short-term care institution receives the same information, the guideline for the integration of assistive technologies was elaborated which can be used both in Austria and Slovenia. It is necessary that nursing personnel have some instruction before using the guideline for the first time. Furthermore, it is useful to give nursing personnel who conduct the nursing consultation the chance to try out the relevant assistive technologies, for example in a living lab with various assistive technologies. Additionally, it is also necessary to establish a common understanding of assistive technologies.

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