Connecting Health and Humans
K. Saranto et al. (Eds.)
IOS Press, 2009

doi:10.3233/978-1-60750-024-7-74

From e-Health to Integrated Health Care: Theory and Practice

Vesna PRIJATELJ[a] and Uroš RAJKOVIČ[b]

[a] *School of Health Science Novo Mesto, Slovenia*
[b] *Faculty of Organizational Science, University of Maribor, Slovenia*

Abstract. Introduction: Health care organizations and providers are under constant pressure to do more with less. On the other hand, users of health care services are faced with problems due to errors in communication between professionals, fragmentation of care and gaps in the continuum of care. Objectives: The aim of this study was to explore the meaning of the term 'integration' with reference to health, and underscore the need for integration of the healthcare systems. Methods: The literature study approach was employed. The first part underlines the conceptualizations of integration and methods for healthcare integration in practice. In the second part, the current situation in Slovenia in this field is outlined. Results: Activities are currently underway for laying down the fundamental normative infrastructure and legal bases for implementation of the eHealth projects, establishing a common health information network, and creating the bases for a standardized electronic health medical record. Conclusions: In the 'top-down' method, we concentrate mainly on general organizational changes for the purpose of achieving coherence and optimization. Projects that focus on the needs of individual patient groups belong under the 'bottom-up' process of integration. To achieve an optimal degree of integration, all health professionals have to play a key role in formulating the strategy of integration at all levels of healthcare.

Keywords: integration, integrated care, eHealth in Slovenia

Introduction

The notion of integrated healthcare reflects the need to create coherent and effective healthcare services across disciplinary and institutional boundaries. Integrated care carries the promise of cost-containment through shortening of hospital stay and reduction of inappropriate hospitalizations and admissions to long-term care [1]. In the literature, the term integrated health has different meanings. It is most frequently equated with managed care in the US, shared care in the UK, trans-mural care in the Netherlands, and other widely recognized formulations such as comprehensive care and disease management. Lack of conceptual clarity is a major barrier to promoting integrated care in both theory and practice. It is very important that certain terms like distribution, management, organization, funding and evaluation of healthcare have the same meaning for everyone. Kodner and Spreeuwenberg argue that the concept of integrated care can only be understood by examining its context [2].

1. The Healthcare Differentiation

The word 'integration' stems from the Latin adjective 'integer', meaning 'complete'. 'Integrated' means composed of parts that make up an organic whole. It is mostly used when we want to emphasize that previously separated elements and components have been reunited. In organization sciences, integration forms the basis of systems theory. It is the glue that bonds together individual elements of an organization with the aim to achieve common goals and optimal results.

In order to examine more closely the need for integration in healthcare, we will look back into history. We want to know how many persons participated in the care of a patient through a historical perspective. The first medical doctor known by name was Imhotep, who lived in Egypt around 2650 B.C. and was an adviser to King Zoser. His books contain instructions for treatment of wounds, broken bones, and even tumors, which show that medicine was highly developed in those times. Imhotep was also an astrologer and an architect. In later centuries, he was worshipped by the Egyptians as a god. In ancient China, at the time of the Zhou Dynasty that ruled from 1022 BC to 221 BC B.C., the emperor had three types of doctors. The first was a dietitian, who was in charge of the emperor's diet and prevention of disease. The second was an internist, responsible for treatment of internal diseases. The third was a surgeon, who took care of wounds, fractures and other injuries. Since then and up to the present time, healthcare has been undergoing intense differentiation according to individual specialties. The simple doctor–patient relationship has been replaced by a more complex relationship, where the patient is the responsibility of a team of professionals, each specializing in one aspect of health. Under the influence of numerous factors, healthcare institutions and services also eventually became differentiated. At the same time, physicians, nurses and other health professionals formulated their rules, set the boundaries between individual fields (e.g. psychiatry, social medicine) and laid down guidelines for the development of each field. Different institutional and professional cultures were thus created.

2. Methods for Integration

Attention in healthcare must focus on the individual. However, in the present healthcare system, the care of individual patients is divided up into numerous phases that often do not follow each other in an optimal order, and the costs of care are increasing due to lack of coordination and cooperation between individual specialties. Patients feel lost in the system, long waiting lists are formed, patients are dissatisfied [2]. By definition, healthcare is a complex process dealing with the patient as a whole. Thus integration of the healthcare system in terms of reunification of its previously separated elements is urgently needed.

In the process of integration, various methods and models of funding, management and organization are used to create links between institutions, provide guidance and promote cooperation. The goal of these methods and models is to enhance quality of care, quality of life, user satisfaction and efficiency of the healthcare system.

The terms ‘top-down ' and 'bottom-up' are used to describe two different yet related methods for designing a strategy. In the 'top-down' method, we concentrate mainly on general organizational changes with the aim to achieve coherence and optimization at different levels. In the bottom-up process, we focus on the needs of individual patient groups; we try to determine if the system is meeting these needs and to decide why integration is needed and where and how it should be accomplished.

Funding, legislation, management, organization of linkage, organization of supporting services, and the professional/clinical field are areas on which we focus in planning integration with the aim to prevent bottlenecks in the continuity of care [2].

In addition to assuring funding, it is necessary to consolidate the responsibility and authorization of participants in the system, and to define the links between them and modes of cooperation at all levels. Services providing support to continuous treatment must be organized so that they guide and supervise the patient in an optimal way during

the treatment process. For this purpose, information systems must be integrated and information must be centralized.
In the professional (clinical) domain, a common professional language, common standards, uniform diagnostic criteria and evaluation methods, and common decision-making tools (e.g. clinical guidelines and protocols) must be developed. For comprehensive patient care, exchange of clinical records must be made possible and regular contacts with the patient and/or family must be maintained throughout the treatment cycle.

2.1. Levels of Integration

There are different forms and levels of integration. The fundamental condition for integration of healthcare is *functional integration*, which includes integration of professional (clinical) fields, information systems and financial arrangements. Nies [3] describes three levels of integration, based on the intensity of connections between organizations: linkage, coordination within the healthcare network and full integration. *Linkage* is the first level of integration. It takes place between existing organizational units. It aims at an adequate referral of patients to the right unit at the right time, and good communication between professionals involved in the treatment. Clinical guidelines and protocols describing what shall be done, by whom and when, are examples of mechanisms used in this form of integration. There is no cost shifting between units. *Coordination within the healthcare network* is a more structured type of integration, but it still operates through existing organizational units. The aim is to coordinate different health services, to share clinical information, and to manage the transition of patients between different units. *Full integration* implies that resources of different organizations are pooled in order to create a new organization. The aim is to develop a comprehensive service which will meet the needs of specific patient groups. The optimal degree of integration depends mainly on the need for integration of individual patient groups with common needs. By accurately defining input/output data and processes between participants in the treatment, we can improve the flow through the system. At the same time this allows us to evaluate integration from the point of view of the patient, the profession and the management at different levels.

3. Creating the Conditions for Integrated Care in Slovenia

3.1. Health Sector Management Project

Intense informatization of healthcare services in Slovenia began in the 1990's. Within the framework of the Health Sector Management Project, activities were planned with a view to transforming the health policy in the areas of funding, management and formulation of professional guidelines. Two major objectives were the development and introduction of an electronic health insurance card and an electronic patient record.
The development of the health insurance card began in 1996. In 2000, the card became the exclusive health insurance document in Slovenia. It is an electronic tool for communication between the insured person, physician, health centre, hospital, health insurance provider and pharmacy. Slovenia was one of the first European countries to implement such a system at the national level. The introduction of the health insurance card was an important step in the process of securing financial discipline within the healthcare sector. This was confirmed by cost-benefit analyses carried out before and after the card was introduced.

The development of health informatics standards in Slovenia has been underway since 2000 as part of the Health Sector Management Project also. With reference to data, emphasis in the project is placed on the compilation of a national dictionary of terms and definitions used in a standardized health information system. The main effort to standardize nursing documentation was made within the project Documentation-Based Quality Assurance in Nursing Care, sponsored by the Ministry of Health (2003-2004). The final aim of the project was to develop an up-to-date tool for documenting nursing care in electronic and printed form. The electronic documentation derived from this project is based on a common data set containing information on the patient and his/her family. The data are suitable for statistical analysis and application of various models to assist with decision making and identification of patterns. [4, 5, 6, 7]
The Health Sector Management Project so far has yielded the following results: introduction of the electronic health insurance card, implementation of a DRG scheme for categorization of acute inpatient episodes, and implementation of a new reimbursement model for hospitals. All hospitals have been connected to the government health information network by means of secure ID cards and digital certificates. The development of reimbursement models for other levels of healthcare (primary care, rehabilitation, specialist treatment) and formulation of Slovene clinical guidelines and clinical pathways are still in progress.

3.2. The eHealth 2010 Strategic Plan

In December 2005 the Slovenian Ministry of Health launched its strategy for informatization of the healthcare system in Slovenia (eHealth 2010). The strategic objectives of this plan [8] were:

- developing and implementing a system of electronic health records at the national level;
- setting up a national health information portal, which will ensure safe and reliable exchange of data between all relevant parties in the healthcare system, provide access to electronic services, allow for easy transfer of information;
- to establish e-Business as a standard tool in the Slovenian health sector.

In accordance with the eHealth 2010 strategic plan, the National Health Informatics Council was established in June 2006, followed by establishment of the Health Informatics Standardization Board. These are two of the three key components of the national health informatics structure. The third component, the Health Informatics Centre, still needs to be set up.
Considerable progress has been made in the field of teleradiology: a link has already been established between two hospitals, which allow digital radiographs to be exchanged with the use of modern technology and safety criteria. In the field of public health, as part of the Health Statistics Data Centre project, concerned with collecting, processing and reporting of public health data, the Institute of Public Health has begun implementing a new system for monitoring influenza-like diseases and acute respiratory infections. Informatization of the Register of Births, Deaths and Marriages has created an environment that allows for allocation of personal ID numbers to infants directly after birth in the maternity hospital and electronic entry of births and deaths into the register.
Activities are currently underway for laying down the fundamental normative infrastructure and legal bases for implementation of the eHealth projects, setting up basic information technology for healthcare providers, establishing a common health

information network, and creating the bases for a standardized electronic medical record.

4. Conclusion

With the Health Sector Management Project in Slovenia, activities were initiated for the purpose of transforming health policy in the areas of funding and management. Further activities underway within the eHealth 2010 strategic plan consist of establishing key components of the national health informatics structure, integration of information systems and centralization of information. In the 'top-down' method, we concentrate mainly on general organizational changes for the purpose of achieving coherence and optimization. Projects that focus on the needs of individual patient groups (influenza-like diseases, acute respiratory infections, infants) belong under the 'bottom-up' process of integration. This process attempts: (a) to determine if the system is meeting these needs, (b) to facilitate in determining why integration is needed, and (c) where and how it should be accomplished. A second level of integration has been achieved (according to Levtz, 4) by establishing coordination with various health services and the sharing of clinical information. Still, a number of activities have to be completed to achieve full integration. We need to develop a comprehensive service that will meet the needs of specific patient groups and to allocate appropriate resources. To achieve an optimal degree of integration, all health professionals, especially physicians and nurses have to play a key role in formulating the strategy of integration at all levels of healthcare. A well-planned national strategy is the guiding principle in approaching the proverbial finish line, where information technology should be an indispensable tool to support us on this long and arduous path.

References

[1] Ellingsen G, Munkvold G. Special issue: Infrastructures to support integrated care: connecting across institutional and professional boundaries - Infrastructural arrangements for integrated care: implementing an electronic nursing plan in a psycho geriatric ward. Int J Integr Care [serial online] 2007 May 16 Apr–Jun; 7: e15. Avaiable from: http://www.ijic.org/ (last accessed Jun. 23, 2008)

[2] Kodner DL, Spreeuwenberg C. Integrated care: meaning, logic, applications, and implications – a discussion paper. Int J Integr Care [serial online] 2002 Oct–Dec; 2: e12. Available from: http://www.ijic.org/ (last accessed Jun. 25, 2008)

[3] Nies H, van Linschoten P, Plaisier A, Romijn C. Networks as regional structures for collaboration in integrated care for older people. In: IJIC / WHO Conference 2003 Proceedings; 2003 Feb 21-22; Barcelona, Spain. Available from: http://www.ijic.org/portal/section.html?publish/issues/conferences.html,publish/issues/conf2003/proceedings.html (last accessed Jun. 23, 2008)

[4] Leutz W. Five laws for integrating medical and social services: lessons from the United States and the United Kingdom. The Millbank Quarterly 1999; 77(1): 77–110.

[5] Rajkovič U, Šušteršič O, Rajkovič V, Prijatelj V. A new approach in nursing documentation: community nursing case. In: Kuhn KA, Warren JR, Leong TY, editors. MEDINFO 2007. Proceedings of the 12th World congress on health (medical) informatics; 2007 Avg 20-24; Brisbane, Australia. Amsterdam: IOS Press; 2007.

[6] Šušteršič O, Rajkovič V, Leskovar R, Bitenc I, Bernik M, Rajkovič U. An information system for community nursing. Public Health Nurs 2002; 19: 184-90.

[7] Bohanec M, Zupan B, Rajkovič V. Applications of qualitative multi-attribute decision models in health care. Int J Med Inf 2000; 58-59: 191-205.

[8] eHealth ERA. E-Health Priorities and Strategies in European Countries: Fact sheet Slovenia [online]. 2007 Available from: http://www.ehealth-era.org/database/documents/factsheets/Slovenia.pdf (last accessed Jun. 20, 2008)

Email address for correspondence: prijatelj.vesna@gmail.com