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Person-centeredness is widely recognized as a multidimensional concept that advocates patients’ informed decisions, successful management of their own health and care, and choice when to invite others to act on their behalf (Silva, 2014). It is a conception that comprehends patients as peer partners in planning, developing and assessing care. In other words, person-centered care is about co-production rather than consumerism. Moreover, the Institute of Medicine prioritizes six dimensions of patient-centeredness as decisive to supporting quality healthcare. These are (US Institute of Medicine, 2001):

- Being respectful of patients’ values, preferences, and expressed needs
- Being coordinated and integrated
- Providing information, communication and education
- Ensuring physical comfort
- Providing emotional support and easing fear and anxiety, and
- Involving family and friends

However, reviewers have argued that the model of person-centered care is somewhat rhetorical and equates to ‘consumer-based’ model rather than a psychosocial approach. Moreover, they also contend that there is no unopposed definition of person-centered care in the empirical literature (Silva, 2014). As a result, the complexity of the theory raises the need to articulate its shared meaning and explicate how it can be put into use.

Additionally, the term ‘patient-centered care’ which is more frequently used than person-centered care and tends to describe a much wider range of disease areas has often been analyzed as a multifaceted construct (Ishikawa, Hashimoto, Kiuchi, 2013) with no single theory that can sufficiently define the whole idea or lacking a unified definition and operationalized measurement (Silva, 2014).

On the other hand, notwithstanding patient-centered care may be considered of modern origin, its essence can unquestionably be found in the Hippocratic Oath. Respect and broad-mindedness to the patient needs, relevant ethics, and concern for community well-being are prominently evident in Hippocrates. However, this inclination to the origins of medicine has been long discontinued. Beneficence as a bioethical teaching has lost part of its radiance, dominated by the belief of autonomy and by the current emphasis on defending the medical commonality. As a consequence, medicine has missed its holistic focal point, which patient-centered philosophy aims to regenerate for patients.

The holistic notion upholds that each aspect of patient’s needs including corporeal, social and mental should be taken into account and perceived as a whole.
How exactly, do you do that? What does ‘emotional, spiritual and mental needs’ look like in a doctor-patient encounter?

The doctor-patient relationship can be seen as a social mechanism for salubrious impact on the patient’s well-being (Benedetti, 2011). The important point is to realize why this social interplay is necessary to stimulate the endogenous mechanisms that handle expectation and placebo outcomes. However, the reason a social mechanism of that kind surfaced in the course of evolution appears to be considerably reasonable. There are numerous benefits of altruism and social partnership. Suppression of psychological uneasiness by human interactions warrants a robust mechanism to recover, at least in part. In this context, following evolutionary theory, the healthcare system can be more complicated and can acquire the qualities of an actual endogenous system. According to Humphrey (2002), the ability to stimulate expectation in addition to placebo mechanisms following the doctor-patient encounter is an emergent issue and essential feature of the ‘natural healthcare service’. Humphrey (2002) claims that patient’s body together with the brain have a considerable role in healing themselves but that capacity for self-cure is not revealed spontaneously, but can be triggered by the influence of the doctor. Therefore, the pivotal point is to realize why the patient-doctor encounter is needed to initiate the self-cure mechanisms.

The conceptualization of an endogenous healthcare system by Humphrey (2002) is extremely useful to know why the doctor-patient encounter is necessary in order to trigger expectation in addition to placebo mechanisms in the patient’s brain. Doctors and health professionals represent environmental variables that act on the patient’s brain by inducing expectancies of benefit and hope. Health professionals are crucial actors in this process, as they promise treatment and induce expectations and hope for the patient’s future well-being. The patient’s expectations also play a key role. If the patient wants to consult a physician, this is because of his beliefs about the doctor’s healing skills. Therefore, the ‘healer’ is the environmental variable that triggers endogenous mechanisms of self-cure. From both an evolutionary, neuroscientific and patient-centered care perspective, it is obvious that the therapist belongs to the system and has a pivotal role in triggering all mechanisms that take place in the patient’s brain.

Conclusively, patient-centered care should be defined as the symmetry of the artful and the perfunctory element that is represented by the Ancient Greek word ‘techne’. As a result, patient-centered care is the competence to produce a preconceived outcome using consciously controlled and directed action, which involves (Moumtzoglou, 2014):

- The undivided completeness and universality of human health defined as the state of being free of physical or psychological malfunction
- The rational and ethical principles used by health professionals to distinguish between different procedures, and observe the correct diagnosis and action in each case
- The environmental variables that act on the patient’s brain by inducing expectancies of benefit and hope

THE CHALLENGES

The health care environment is currently changing to meet technology and societal trends which converge to bring into being new communication patterns that connect and coordinate the roles of healthcare stakeholders. At the same time, the healthcare industry is steering inexorably toward a distributed-service design in which essential decision-making occurs at the point of care. One of the central engines of this
shift towards decentralization and reorientation of healthcare services is mobile healthcare (mHealth). mHealth describes the use of a broad range of telecommunication and multimedia technologies within a wireless care delivery design and can be broadly defined as the delivery of healthcare services via mobile communication devices. mHealth establishes healthcare communities in which every stakeholder can participate. However, it disrupts the traditional service model where healthcare information, security and access is centrally managed, maintained and limited, transforming the healthcare sector and destroying components that are slow to adapt.

mHealth interventions range from simple to complex applications and systems that remotely coordinate and actively manage patient care. In this context, it offers an elegant solution to the problem of accessing the right information where and when it is needed within highly fluid, distributed organizations. Moreover, it removes geography and time as barriers to care by establishing connectivity with remote locations and remote workers, creates new points of contact with patients, and changes the frequency and intensity of healthcare delivery. It also establishes effective new treatment modalities like telehealth, remote patient monitoring, self-care and home health while it blurs the boundaries between professional medical advice and self-care. Overall, mHealth blends three bodies of knowledge: high technology, life sciences, and human factors.

On current trends, mHealth embraces medical and public health practice sustained by mobile phones, patient monitoring devices, personal digital assistants (PDAs), and tablet PCs. The spread of 3G and 4G networks has boosted the use of mobile applications offering healthcare services. 4G is a mobile network, IP-based, providing a connection via the best network using seamless roaming and independent radio access technologies. In 4G mobile systems, different access technologies are combined in the best possible way for different radio environments and service requirements. They promise much larger data rates supporting full mobility while enabling wireless connection and access to multimedia services with high-quality voice and high-definition video. In addition, the availability of satellite navigation technologies in mobile devices supports safety and autonomy of patients. Through sensors and mobile applications, mHealth permits the accumulation of extensive medical, physiological, lifestyle, daily activity and environmental data.

Consequently, mHealth serves evidence-driven care practice and research activities while expediting patients’ access to health information and accommodating lifestyle and wellbeing applications, counseling systems, health information and medication reminders. However, beyond clinical connectivity, mHealth is a field that came to light holding the promise of quality improvement, cost reduction, wholesale gains in population health, access to care and better allocation of health-delivery resources. With mHealth, healthcare professionals can continuously monitor and manage health conditions. As a result, mHealth becomes embedded in some care delivery strategies, including the medical home, a health information exchange, the care team and patient-centric healthcare.

In its fullest flowering, mHealth it is expected to address the most intractable problems of healthcare quality and cost, chronic disease management, public health, wellness, and prevention. However, the impact of mHealth is just beginning to be felt as it results in more personalized medication and treatment and contributes to patient-centered care.
SEARCHING FOR A SOLUTION

There is no standardized definition of mHealth. However, in most cases, mobile health or mHealth is defined as medical and public health practice supported by mobile devices involving:

- The use and capitalization on a mobile phone’s core utility of voice and short messaging service
- Applications including general packet radio service (GPRS), third and fourth generation mobile telecommunications (3G and 4G systems), global positioning system (GPS), and Bluetooth technology

Mobile health became functional in biomedical engineering and started with looking at wireless and sensor technologies that could be incorporated to monitor people’s health at a distance. mHealth implementation came out in developing countries out of access necessity. Moreover, mobile phones had been around for years, but it was not until 1976 that mobile phones first appeared in Japan. However, a lot of work happened predominantly in the early millennium when mHealth started to develop mobile health applications for cellphones. The early days there were things like remote cardiac monitors that evolved to look at diabetes monitoring and other types of sensor technologies. The early programs provided support tools for supply chain management while mobile communications gave access to areas that people never had using fixed line telephones. More recently, mHealth evolvement provided access to emergency medical transportation services, facilitated patient-doctor encounter, and there was a movement to personal digital assistants use.

mHealth is increasingly being used in the healthcare field since its use is becoming a cost-effective method of identifying and monitoring health issues, as well as guiding the formulation of health policies. Programs to support the professional development of people in the health field, using mHealth technology, are becoming readily available. mHealth also provides health professionals with access to patient data as well as access to various information sources, both of which provide valuable assistance in the diagnosis and formulation of treatment. Individuals can use mHealth to access resource materials on health issues. Patients can self-monitor and transmit information to their health care provider making mHealth particularly important to people living in remote areas or those who are physically impaired.

While the timely emergence of mHealth did not resolve the myriad problems, it offers unique opportunities to reduce cost, increase efficiencies and improve the quality and access to care. Home-based monitoring helps hospitals track patient recovery and compliance, thereby minimizing costly episodes of re-admission. Coordination between departments and providers reduces wasteful spending and improves the quality of care. Moreover, with rapid consumer adoption of smartphones, physicians can perform two-way videoconferencing while patients and physicians have access to medical records and vital signs. Finally, wireless technology allows physicians to serve more patients despite geographical limitations.

In this context, the book explores the emergence of mHealth in the healthcare setting by:

- Focusing on the broad range of technologies available
- Tackling the effects of mHealth on the industry and stakeholders exploring the infrastructure and architecture needed to support these technologies
- Discussing the evolvement of various stakeholders and the impact of mHealth on existing technology
- Analyzing the transformation of the business model
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Looking forward, it explores how mHealth reshares access, quality, and treatment and demystifies the impact of mHealth on patient-centered care. Conclusively, it intends to:

- Support students understand the effect of mHealth technologies on quality in healthcare
- Help healthcare professionals better understand the needs of their patients
- Act as an assistant for patients to derive more benefits from their healthcare
- Encourage e-health systems designers and managers to ground everyday practice on mHealth technologies

The prospective audience includes undergraduate and extended degree programs students, graduate students of health care quality and health services management, executive education and continuing education, health care managers and health professionals.

ORGANIZATION OF THE BOOK

In Chapter 1, Peter Waegemann argues that mHealth systems have been maturing since 1995, yet there remains no common definition. The widest definition encompasses not only mobile devices and digital communication systems but also the multitudes of apps and add-ons for those mobile devices and systems. Accordingly, mHealth is an indicator of emerging communication-based healthcare and an enabler of participatory health. mHealth implementation and user acceptance varies by geographical region. In the most advanced regions, mobile device and new communication systems lead to disruptive changes that improve the quality of care and reduce healthcare costs. At the same time, providers and public authorities are challenged with designing and implementing mHealth policies and security measures. Ultimately, mHealth will change healthcare procedures, the structures of healthcare, and the roles of patients and healthcare professionals.

In Chapter 2, Yiannis Koupouros & Aggelos Georgoulas present a thorough review on the most up to date research and development activities funded by the European Union in the m-health sector. The review brings to light the latest research directions and trends that are taking place in Europe and the world. The mHealth market is analyzed along with the focusing on the main apps and their classification. Moreover, they discuss the trends of the research topics addressed and what are the plans and future activities pushed. The obstacles faced, the pros and cons and the proposed actions, and their match to real life situations are also discussed. The chapter concludes with the current trends and the potential market for m-health solutions and innovations and how they are trying to address the global need for patient-centered care.

In Chapter 3, Kostas Giokas, Panagiotis Katrakazas & Dimitris Koutsouris argue that the ageing process of EU population has played a key role raising the prevalence of chronic diseases, with more than 80% of people in the last age group (65-74) reported to be having three or more long-term Multimorbidity or Multiple Chronic Conditions (MCCs). The main problem is that currently, clinicians have limited guidance, as well as evidence of how to approach care decisions for such patients. As a consequence, the understanding of how to best take care of patients with multimorbidity conditions may lead to improvements in Quality of Life (QoL), utilization of healthcare, safety, morbidity and mortality. The root of this problem is not narrowly confined to guidelines development and application but is inherent
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throughout the translational path from the generation of evidence to the synthesis of the evidence upon which guidelines depend.

In Chapter 4, Kostas Giokas, Vassilia Costarides & Dimitris Koutsouris aim to address preventive solutions for high Blood Pressure (BP) by improving adherence to lifestyle changes as well as therapy compliance by patients’ education and monitoring of compliance. They aim to create a systemic solution for health promotion and disease prevention to support hypertensive citizens and healthcare professionals in co-producing healthy management and preventive care actions leading to behavioral changes. They try to join the concept of prevention centered on a) promotion of subject empowerment, b) engagement of citizen at risk, c) provision of physicians with user-friendly devices, d) supporting behavioral changes of citizens in the adherence of lifestyle protocols, e) introduction of innovative organizational models to improve healthcare system performance.

In Chapter 5, Ioannis Tamposis, Abraham Pouliakis, Ioannis Fezoulidis & Petros Karakitsos analyze the background of applications related to medical imaging and clinical and laboratory medicine. They introduce a technological framework supporting mHealth applications in an agnostic manner. Within this framework, they present two application examples. The first application (ImaginX) supports a health ecosystem (hospitals, radiologists, clinicians, patients) medical image management. The second application (HPVGuard) supports a divergent but cooperating environment of the laboratory and clinical doctors and patients involved in cervical cancer prevention and control. The two applications are analyzed, and issues related to user acceptance and future directions are presented.

In Chapter 6, Assim Sagahyroon discusses the use of mHealth in the monitoring and diagnosis of sleep-related diseases with a particular emphasis on sleep apnea since it is considered to be one of the most prevalent disorders. Apnea symptoms and the physiological signals associated with it are described with an overview of the current sensing technology used to capture and record these signals. The chapter continues to discuss the integration of sensors with today’s mobile devices to offer mhealth platforms that allow for the monitoring, diagnosis and management of sleep apnea.

In Chapter 7, Elpis Vlachopapadopoulo & Dimitrios I Fotiadis argue that mhealth solutions are already used for self-management, remote monitoring and counseling of several chronic conditions, including diabetes mellitus, heart failure, Parkinson’s disease, etc. Today, these solutions can result in closed loops, which support health self-management for chronic diseases, in a personalized manner. Concerning childhood obesity, those solutions can combine targeted games and motivational approaches towards both physical activity and diet. In this context, they could help in addressing this serious and global health issue, in the direction of minimizing co-morbidities and eventually preventing serious, life-threatening events.

In Chapter 8, Hakan Altinpulluk & Gulsun Eby explain how the mHealth ecosystem and Universal Design principles could be used in designing an “interactive augmented reality 3-D pop-up book” that can be viewed on mobile devices. The book addresses bipolar disorder and is the first mHealth study in the literature.

In Chapter 9, Petre Ilchev, Andrzej Śliwczyński, Potr Szynkiewicz & Michał Marczyk analyze the role of m-health applications supporting patients with chronic diseases, based on examples from asthma care.

In Chapter 10, Bibiana Metelmann & Camilla Metelmann show that smartphone applications that allow retrieval of data or real-time communication with a remote medical expert can be brought to the emergency site. In this context, high definition video communication offers the highest amount of mHealth communication currently available in prehospital emergency medicine. In the LiveCity EU funded project, a special video camera was developed and tested showing an improvement of the quality of patient care.
In Chapter 11, Chinmay Chakraborty, Bharat Gupta & Soumya K. Ghosh describe the implementation of a mobile telemedicine system for the monitoring of chronic wounds. The main objective of their work is to design and develop a tele-wound technology network (TWTN) that acquires, and processes information in monitoring chronic wounds.

In Chapter 12, Abraham Pouliakis, Stavros Archondakis, Niki Margari & Petros Karakitsos argue that there are limited mobile applications relevant to cytopathology. However, mobile applications could be used in numerous activities of the cytopathology laboratory, including and not limited to: training, reporting, diagnosis and consultation, laboratory management, whole slide imaging, interactions between patient-doctor, doctor-doctor and within the laboratory personnel, quality control and assurance.

In Chapter 13, Archondakis Stavros, Eleftherios Vavoulidis & Maria Nasioutziki present a thorough research of mobile applications related to cytopathology and try to foresee applications that may benefit the modern cytopathology laboratory and its clients. The feasibility of adopting mobile applications for inter-laboratory comparisons, proficiency testing, and diagnostic accuracy validation is also examined. Finally, the role of mobile applications for providing or/and enhancing the existing laboratory capabilities through educational training and other research activities is investigated.

In Chapter 14, Stelios Zimaras argues that viruses quickly spread through the Internet exploiting security holes. Epidemiological models have traditionally been used to understand and predict the outcome of virus outbreaks either in human or animal populations. However, the same models were recently applied to the analysis of computer virus epidemics.

In Chapter 15, Shada Alsalamah, Hessah Abdullah Alsalamah, Alex W. Gray & Jeremy Hilton define a common collaboration-driven information security while identifying requirements in Legacy Information Systems to address the inconsistent policies in modern PC collaborative environments that would help improve the quality of care.

In Chapter 16, Anastasious Mounitzoglou argues that emerging M-Health technologies provide fundamentally different ways of looking at tailored communication technology. As a result, tailored communications research is poised at a crossroads. It needs to both build on and break away from existing frameworks into new territory, realizing the necessary commitment to theory-driven research at basic, methodological, clinical, and applied levels. In this context, the revolution of M-Health holds great promise in both health care and public health.

The chapter envisions tailored M-Health communication in the context of patient-centered care, as it remains to be seen whether the revolution in M-Health will provide the tools to engineer sufficient impact on patient-centered care and tailored communication.

In Chapter 17, Anastasious Mounitzoglou explains that self-care emerged from the concept of health promotion in the 1970s while from 2000 onwards the term ‘self-management’ gained popularity, with a greater focus on long-term conditions and the trend towards more holistic models of care. Although ‘self-management’ and ‘self-care’ are often used interchangeably, a distinction between the two concepts can be made. Both can be considered in terms of a continuum, with self-care at one end as ‘normal activity’ and self-management an extension of this. Self-management support is the assistance given to patients in order to encourage daily decisions that improve health-related behaviors and clinical outcomes. Self-efficacy, which is grounded in social cognitive theory, is defined as confidence in one’s ability to perform given tasks.

The chapter envisions these concepts on a continuum with one pole representing mobile health and the other self-efficacy. It concludes that self-management support is the nexus of mobile health and self-efficacy.
REFERENCES


