International Journal of Medical Informatics 112 (2018) 45–58

Contents lists available at ScienceDirect

International Journal of Medical Informatics

journal homepage: www.elsevier.com/locate/ijmedinf

# The impact of media type on shared decision processes in third-age populations

Iris Reychav[a,*], Inam Najami[a,b], Daphne Ruth Raban[b], Roger McHaney[c], Joseph Azuri[d,e]

[a] Department of Industrial Engineering & Management, Ariel University, P.O.B 40700, Ariel, Israel[1]
[b] Department of Information & Knowledge Management, Faculty of Management, University of Haifa, Haifa, 3498838, Israel
[c] Management Information Systems, 3092 Business Building, Kansas State University, Manhattan, KS, 66506, United States
[d] Sackler Faculty of Medicine, Tel Aviv University, Israel
[e] Maccabi Healthcare Services, Israel

## ARTICLE INFO

*Keywords:*
Shared Decision Making
Informed Shared Decision Making
Aged
Technology acceptance
Digital media
Assisted living

## ABSTRACT

*Purpose:* To examine the relationship between the media, through which medical information was made available (e.g. digital versus printed), and the patients' desire to play an active part in a medical decision in an SDM or an ISDM-based process. The goal of this research was to expand knowledge concerning social and personal factors that affect and explain patients' willingness to participate in the process.

*Methods:* A questionnaire was distributed in this empirical study of 103 third-age participants. A theoretical model formed the basis for the study and utilized a variety of factors from technology acceptance, as well as personal and environmental influences to investigate the likelihood of subjects preferring a certain decision-making approach. The research population included men and women aged 65 or older who resided in five assisted living facilities in Israel. The sample was split randomly into 2 groups. One group used digital information and the other print. A path analysis was conducted, using Structural Equation Modelling (SEM) in AMOS SPSS, to determine the influence of the information mode of presentation on the patient's choice of the SDM or ISDM model.

*Results:* When digital media was accessible, the information's perceived usefulness (PU) led participants to choose an ISDM-based process; this was not true with printed information. When information was available online, higher self-efficacy (SE) led participants to prefer an SDM-based process. When the information was available in print, a direct positive influence was found on the participant's choice of SDM, while a direct negative influence was found on their choice of an ISDM-based process. PU was found to be affected by external peer influences, particularly when resources were made available in print. This meant that digital resources tended to be accepted at face value more readily. Cognitive absorption had a positive effect on the research variables only when the information was available digitally. The findings suggest the use of digital information may be related to cognitive functions of older adults, since the use of digital technology and information requires more cognitive effort.

*Conclusions:* The study illustrates factors that make patients choose SDM or ISDM-based processes in third-age populations. In general, the results suggest that, even though a physician may attempt to place the patient in the center of the decision process, printed information does not empower the patient in the same way that digital resources do. This may have wider ramifications if the patient does not buy into the treatment plan is and becomes less motivated to be compliant with the treatment. Another key contribution of this research is to identify processes that reflect information assessment and adoptions, and the behaviors related to medical decision making, both as a model and as a process. This study suggests what health care professionals should expect to see as the transition to more digital information sources becomes the norm among the elderly population. Future research is needed to examine this model under different conditions, and to check for other variables and mechanisms perceived as mediators in the choice of SDM or ISDM processes.

* Corresponding author.
*E-mail addresses:* irisre@ariel.ac.il (I. Reychav), inamnaom.najami@msmail.ariel.ac.il (I. Najami), draban@univ.haifa.ac.il (D.R. Raban), mchaney@ksu.edu (R. McHaney), azuri_yo@mac.org.il (J. Azuri).
[1] Homepage: http://www.ariel.ac.il/iem/Faculty.aspx.

https://doi.org/10.1016/j.ijmedinf.2018.01.004
Received 31 August 2017; Received in revised form 1 January 2018; Accepted 6 January 2018

## 1. Introduction

Patients have traditionally respected their doctors' judgment, entrusting the latter with the sole responsibility for healing their diseases, and for making decisions about different treatments. Yet, over the years, cultural, social, and legal changes have moderated this paternalist approach, which argued that medical knowledge should be the exclusive territory of physicians and specialists in medical fields [1]. The age of information accessibility encourages patients to become more involved in their treatment, thus motivating them to seek higher levels of commitment from medical service providers, and request high-quality information about various paths of available treatments [2].

A review of shared decision literature reveals two main physician-patient treatment models have emerged: Shared Decision Making (SDM); and, Informed Shared Decision Making (ISDM). SDM is most common, characterized by equality, where physician and patient are partners in the decision-making process. ISDM is based on the same principles but with a primary difference: the physician leads the process, but the final decision about the treatment is made by an informed patient.

Both models – SDM and ISDM – are based on cooperation between patients and medical service providers. Both rely on the principle of shared decision-making by patient and caregiver, while considering the patients' values and preferences, based on clinical evidence. Shared decision making is not a goal, but rather the means to achieve the goal – improved health for the patient, who is at the core of the process [3–8].

Since the early 20th century, most developed countries have experienced an increase in life expectancy. In 2012, there were about 562 million *third-age* people in the world, comprising about 8% of the world's population. In 2015, this number had risen to 8.5% [9], and this rate is expected to double by 2050 [10]. For example, according to the World Health Organization, life expectancy in Israel is one of the highest in the world and is rising [11]. Growing life expectancies have changed the physical, social, and financial profile of global society. Still, concerns exist because longer life does not always correlate with good health [12]. Research suggests that poor health is among leading factors limiting the activity of older people, and this requires them to seek help [13]. From a financial-social aspect, over 90% of the institutionalized population resides in assisted-living facilities as a result [14].

The current study examined the relationship between the media through which medical information is made available (e.g. digital information [15] accessible through mobile technologies versus paper-based printed information), and the patients' desires to play an active part in a medical decision in an SDM or an ISDM-based process. The goal of this research was to expand knowledge concerning social and personal factors that affect and explain patients' willingness to participate in the process.

The study focused specifically on third-age population members, and evaluated the value of online information to this population, in general, and in particular, online medical information[16]. This evaluation enabled an assessment of patient willingness to adopt medical information systems and explored their self-efficacy in internet use. This information helps better understand the impact online information resource usage has on this population.

This article contains four sections. The first section presents a literature review which discusses: SDM and ISDM models; basic concepts in decision making; and, different aspects of technology use by third-age adults. The second section offers the research hypotheses and model. The third section describes the findings. Finally, in section four, we discuss factors that affect a patient when choosing an SDM or ISDM model.

### 1.1. Theoretical background

#### 1.1.1. Shared Decision Making (SDM)

Decision-making requires people to use information to draw a conclusion and choose – as part of a cognitive process – between available options [6]. Decision-making has been part of the medical field for a long time with physicians and patients assessing options and determining a course of action for treatment. The concept of Shared Decision Making (SDM), first introduced in the 1970s, sought to formalize this process in the context of medical ethics to recognize patient autonomy. Ever since, it has been the focus of a growing body of research [17].

Makoul and Clayman [7] suggested that SDM was not a unified concept. According to the commonly accepted interpretation, SDM is an attempt to involve patients in the process of making medical decisions; it is an interaction led by the physician. It is dictated by their willingness to share information with the patient, to consider the patient's requests, and respond to their needs to get information and share their feelings [6]. According to the SDM model, the physician and patient share information, thus allowing the patient to explore treatment options available to them, and choose the most suitable one, with the help of their doctor [5,6,18].

Despite the disagreements concerning the exact definition of SDM, most researchers agree that it must include a number of key features: (1) the patient is aware of relevant options available; (2) support and clarifications are offered to the patient whenever needed; (3) the decision about a treatment option is made while considering the patient's concerns, and with their approval; and, (4) the patient is involved in medical decisions that are relevant to their treatment [7,19]. The goal of the SDM model is to help patients help themselves and empower them, thus encouraging them to take responsibility for their own lives and avoid risk factors [20].

The development of the SDM model reflects social transformations in recent decades. Specifically, the traditional doctor-patient relationship, in which the former had held the knowledge and made the decisions, has gradually transformed into a mutually-respectful partnership. This relationship respects the patient's autonomy and allows information sharing, and shared decision making by both parties [2,6,18].

#### 1.1.2. Informed Shared Decision Making (ISDM)

The ISDM model shares many similarities with the earlier SDM model. However, a key difference does exist. The SDM model suggests the patient and physician choose a treatment together, but in the ISDM model, the patient chooses the preferred treatment approach after receiving pertinent information from their healthcare providers, and fully understanding their medical condition. In the ISDM model, the caregiver is the main source of medical information, but their role is limited to just providing relevant and high-quality information – including the benefits and risks associated with various treatments. Ultimately, this assists the patient to make an informed, intelligent decision. The final decision is made by the patient alone, based on the principle of informed consent [19,21]. Barry and Edgman-Levitan [3], as well as other researchers, describe ISDM as a model characterized by the type of information provided to the patient. They argue that this model only works when the interaction between physician and patient is good enough to allow high-quality information sharing [2,22,23].

#### 1.1.3. Basic concepts of decision making

Making decisions is a natural human process in every aspect of everyone's life, based on a system of beliefs, cognitive processes, perceived ease of use, and perceived usefulness [24]. These natural processes form an important aspect of motivating patients to participate in their health care decision-making. The concepts of cognitive absorption (CA), subjective norms (SNs), and self-efficacy (SE) all play key roles in explaining this motivation.