ΑΠΟΨΕΙΣ ΚΑΙ ΣΤΑΣΕΙΣ ΤΩΝ ΕΠΑΓΓΕΛΜΑΤΙΩΝ ΥΓΕΙΑΣ ΣΧΕΤΙΚΑ ΜΕ ΤΟΝ ΗΛΕΚΤΡΟΝΙΚΟ ΦΑΚΕΛΟ ΥΓΕΙΑΣ: ΜΙΑ ΒΙΒΛΙΟΓΡΑΦΙΚΗ ΑΝΑΣΚΟΠΗΣΗ

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ΠΕΡΙΛΗΨΗ

Εισαγωγή: Ποικίλοι παράγοντες διαμορφώνουν θετικές απόψεις και στάσεις των επαγγελματιών υγείας σε σχέση με τον Ηλεκτρονικό Φάκελο Υγείας (ΗΦΥ) ως εφαρμογή Ηλεκτρονικής Υγείας στα συστήματα υγείας διεθνώς.

Σκοπός: Η διερεύνηση των παραγόντων που διαμορφώνουν θετικές ή αρνητικές απόψεις και στάσεις στους επαγγελματίες υγείας αναφορικά με τη χρήση του ΗΦΥ.


Αποτελέσματα: Από σύνολο των δημοσιευμένων μελετών, 71 τηρούσαν τα κριτήρια ένταξης. Τα αποτελέσματα έδειξαν ότι διάφοροι παράγοντες διαμορφώνουν θετικές ή αρνητικές απόψεις και στάσεις στους επαγγελματίες υγείας σχετικά με τη χρήση του ΗΦΥ. Και στις δύο περιπτώσεις αυτοί ομαδοποιούνται σε διακριτούς θεματικούς άξονες ενώ σχετίζονται με την εργασία των επαγγελματιών υγείας, με τα δεδομένα και τις πληροφορίες υγείας και με τη φροντίδα των ασθενών.

Συμπεράσματα: Η επιτυχής εφαρμογή του ΗΦΥ ως τεχνολογική καινοτομία Ηλεκτρονικής Υγείας απαιτεί συντονισμένη δράση από τους σχεδιαστές πολιτικών υγείας. Σε κάθε περίπτωση κατά το σχεδιασμό και την υλοποίηση του συστήματος ΗΦΥ πρέπει να λαμβάνονται υπόψη οι απόψεις και στάσεις των επαγγελματιών υγείας.

Λέξεις Κλειδιά: Ηλεκτρονικός Φάκελος Υγείας, επαγγελματίας υγείας, άποψη, στάση.

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REVIEW

Opinions and attitudes of health professionals on the electronic health record: A literature review

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ABSTRACT

Background: A variety of factors shape the positive views and attitudes of health professionals in relation to the Electronic Health Record (EHR) as an application of eHealth in health systems internationally.

Aim: The investigation of the factors that shape positive or negative views and attitudes in health professionals regarding the use of EHR.

Materials and Methodology: A systematic review of the literature was conducted from 2002 to 2020 in the Greek and English languages, in the databases: Cinahl Database | EBSCO, Google Scholar, Library and Information Science - Elsevier, PubMed and Scopus. The search strategy for bibliographic databases in English or Greek included the use of keywords such as: (“electronic health record” OR “EHR”) AND (“health professional” OR “Opinion” OR “attitude”). During the review, various sub-selection criteria of the studies were used.
Results: Out of a total of published studies, 71 met the inclusion criteria. The results showed that various factors form positive or negative views and attitudes in health professionals about the use of EHR. In both cases, they are grouped into distinct topics related to the work of health professionals, health data and information, and patient care.

Conclusions: The successful implementation of EHR as an eHealth technological innovation requires coordinated action by health policy makers. In any case, the design and implementation of the HER system must incorporate the opinions and perspectives of health professionals.

Keywords: Electronic Health Record, health professional, opinion, attitude.

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INTRODUCTION

Human behavior is a function of behavioral tendencies, habits, mental stimuli and the conditions prevailing in the environment in which the individual acts. Fishbein and Ajnen define "Attitude" as "the general and permanent, favorable or unfavorable emotion, which refers to an object, event, or situation that precedes behavior and can change over time."

For their part, Thurstone and Chave approach "Viewpoint" as the verbal expression of attitude. Attitudes are influenced by the individual’s previous experiences determining their behavior. According to Kim and Kim, the acceptance of an innovation is determined by the attitude of individuals towards it and by the individual’s willingness to adopt an innovation. New behavior. It is pointed out that one of the most important motivations for almost every person to adopt an innovation is the desire to gain social status. At the same time, the attitude of health professionals takes on a positive or negative character depending on the successful or unsuccessful implementation of a technological system, a fact which is primarily expressed through its ease of use.

The knowledge and interpretation of the attitudes of health professionals, regarding the use and acceptance of a technology such as the Electronic Health Record (EHR) are necessary conditions for evaluating the degree of fulfillment of its strategic goals. In particular, health professionals develop a system of beliefs, perceptions and attitudes, based on the combination of theory and practice that are interrelated situations in their sciences. The main factor in the formation of opinions and attitudes about issues of daily clinical practice are their experiences and experiences.

AIM

The purpose of this literature review was to investigate the factors that shape positive or negative opinions and attitudes among health professionals regarding the use of EHR.

MATERIAL AND METHODOLOGY
A systematic review of the literature was conducted on the topic of health professionals’ perspectives and attitudes regarding the use of EHR. The method used to search the scientific literature is crucial for producing an effective review. The international bibliographic databases investigated were: Cinahl Database | EBSCO, Google Scholar, Library and Information Science – Elsevier, PubMed and Scopus. The literature search strategy in English language databases included the use of keywords as follows: (“electronic health record” OR “EHR”) AND (“health professional” OR “opinion” OR “attitude”).

In order to complete the review, the following reading strategies were employed: overview, quick reading, exploratory reading, reading for study and critical reading. In addition, keywords in Greek or English were searched for in the title, abstract or the full text of the file retrieved during the search. A variety of individual selection criteria were used. The publication of the scientific material occurred between from 2002 to 2020. Publication in a scientific journal was another criterion for selection, as this ensures the content’s validity and accuracy by virtue of the evaluation that precedes publication. Thus, articles on reviews and meta-analyses, as well as articles written in English and Greek, were included. No methodology restrictions were placed on the primary research in this instance, and it could have been qualitative, quantitative, or mixed.

In addition, there was no restriction regarding the specialties of the health professionals who were the target population and research sample of the studies. In this sense, most of the studies involved physicians or nurses, with fewer involving other health professionals. Health care professionals either worked in private practice or in primary, secondary, and tertiary health care structures. On the other side, articles that addressing the opinion of citizens or administrative health care providers on EHR, as well as data mining and methods for evaluating their design or implementation, were excluded. Research articles of low quality in terms of research methodology and validity as well as articles that were under publication were excluded. In addition, student studies prepared in the context of the completion of their studies and conference papers without a referee system were excluded. Although these studies were published, neither the objectivity of their findings nor their significant impact on the scientific community were documented.

RESULTS

According to Galanis the systematic review of the literature is illustrated in distinct steps. Thus, during the review, 714 files were identified, from which 437 were removed as duplicates and thus 437 were checked. From
these, for reasons mentioned above, 256 files were excluded, and 181 articles were deemed eligible. Then, for the reasons mentioned above, 110 full-text articles were excluded, and finally 71 articles were chosen.

The participants in the studies selected for the theoretical background of the present study were mostly doctors, followed by nurses and then other health professionals such as midwives or physiotherapists. The specific studies retrieved followed either quantitative methodology (n=28), qualitative methodology (n=27) or mixed methodology (n=12), while some reviews or meta-analyses (n=15) were also identified. The literature review highlighted the existence of various factors that influence the formation of positive or negative opinions and attitudes of health professionals regarding the use of EHR.

Factors that shape positive opinions and attitudes

The literature review led to the identification of various factors that shape positive views and attitudes of health professionals in relation to EHR. These factors are grouped into distinct thematic axes as they relate to the work of health professionals, to health data and information, and to patient care.

In particular, in a study by Nguyen et al.\textsuperscript{14} regarding the positive effects of the implementation of the EHR, the clinicians consider the functions of the EHR useful for improving their efficiency, considering that they gain in relation to their performance (flow and workload). The results also agree with those of Howard et al.'s research\textsuperscript{15}, while in the same research it is found that the adoption of EHRs improves the availability and accessibility of medical records, while handwritten health files are not necessary. The last point is also confirmed by other relevant studies.\textsuperscript{16–18} The adoption of EHR also seems not to change the time devoted by physicians to each patient according to Lo et al.\textsuperscript{19} while Banner and Olney\textsuperscript{20} refer to the reduction of nurses' administrative duties in their work.

Chao et al.\textsuperscript{21} in their research reported as a positive element the improved efficiency of health professionals through the quick retrieval of information, a fact that is also supported by other research.\textsuperscript{26–29} Noblin et al.\textsuperscript{24} particularly, emphasize the value of using models, a fact that other studies confirm.\textsuperscript{27,30} In addition, according to a study by Tubaishat\textsuperscript{31}, nurses have positive perceptions of EHRs in terms of perceived use, system quality, and satisfaction. The reported results also agree with those of the recent research by Tsai et al.\textsuperscript{32}

Chao et al.\textsuperscript{21} report that physicians perceive their interdisciplinary communication as improved after EHR implementation through increased access to patient information, a finding that is also confirmed in other
The research of El-Kareh et al.\textsuperscript{33} in a sample of physicians adds that improved communication seems to increase over time after the implementation of EHR, while Howard et al.\textsuperscript{15} and other researchers\textsuperscript{24,35} indicate that communication within the health care team improves overall. Also in other research results\textsuperscript{25,37} the communication that develops within a health care organization facilitates the development of channels between health professionals.

In addition, Kosmman's study\textsuperscript{23} mentions the improved organization of work after the implementation of the NHS, with the possibility of a more equitable distribution of nurses' tasks based on the results of another related study.\textsuperscript{22} In this context, Alsohime et al.\textsuperscript{38} point out the development of better medical care plans by health professionals, without unnecessary forms, a fact that agrees with the results of other related researches.\textsuperscript{25,34,35} Also, in a research by Auefuea et al.\textsuperscript{39} the majority of nurses perceive that EHR supports them in the best planning of their work.

According to some researches\textsuperscript{25,34} the implementation of EHR as perceived by health professionals supports better disease management and the improvement of the quality of care provided. This fact based on research data\textsuperscript{15,21,40} is reinforced by the extraction and monitoring of clinical quality indicators and their identification with national planning strategies.

In addition, in other studies\textsuperscript{16,28} physicians report positive results of EHRs in terms of providing access to updated knowledge, while according to Kuo et al.\textsuperscript{41} informed decision-making can be supported. Of course, over time, in several studies, health professionals point out as an important benefit the improved access to information and patient records through the implementation of the EHR.\textsuperscript{14,24,44,46,27,35,36,38,42-45} In particular other related studies\textsuperscript{22,23} state that nurses believe that increased and valid access to information increases their work performance in hospital settings, which is confirmed in studies concerning primary care structures\textsuperscript{15,28,39} but also in places of care for the elderly.\textsuperscript{21,25}

However, if the access of health professionals is remote, beyond the clinical area, the use of EHR is a perceived advantage\textsuperscript{36,48} although contrary opinions are also found in relative research.\textsuperscript{37,49,50}

Several studies\textsuperscript{14,34,39,43,51} support the perceived accuracy of the data after the implementation of EHRs. This formation of positive perceptions according to Nguyen et al.\textsuperscript{14} is related to the perceived improved quality of documentation on guidelines, a fact that is also confirmed by other researchers.\textsuperscript{25,52,53} Of course, opposing attitudes of professionals are also expressed regarding them.\textsuperscript{14,38,52} In addition, health
professionals in qualitative research\textsuperscript{21,42,51} point out the value of systematic storage of data and information with the creation of backup copies and the consequent reduced possibility of their loss.

Entzeridou et al.\textsuperscript{54} point out that the adoption of EHR by health professionals is related to the improvement of the quality of care provided to patients, a fact that clearly emerges as a result in many studies.\textsuperscript{32,38,60–64}\textsuperscript{42,46,53,55–59} Other researchers also refer in their studies\textsuperscript{14,16,48} that health professionals recognize improved patient safety due to the prevention of medication errors. In this regard, maintaining continuity of care based on common EHR standards is a perceived advantage for health professionals.\textsuperscript{4,23,38}\textsuperscript{4,23,38}

Better communication between patients and healthcare professionals is often cited as a perceived benefit after the implementation of EHRs.\textsuperscript{15,25,27,34,43,48,65} In addition, due to the implementation of EHRs a more cooperative relationship develops between patients and physicians, as they jointly access information and make decisions about their health issues.\textsuperscript{24,44} Finally, Entzeridou et al.\textsuperscript{54} mention reduced costs as additional issues with an effect on the formation of positive opinions and attitudes among health professionals of care and Howley et al.\textsuperscript{66} increased revenue and returns.

Factors that shape negative opinions and attitudes

The literature review also led to the identification of factors that shape negative views and attitudes of health professionals in relation to EHR. These factors are grouped as in the previous case in distinct thematic axes while they are related to the work of health professionals, to health data and information and to patient care. Thus, in contrast to research reports,\textsuperscript{22,23} nurses report that they spend more time using the EHR, while retrieving and locating the necessary information is difficult.\textsuperscript{67} Research also records opinions and attitudes of health professionals towards the EHR, since it is considered that its use has a negative impact on their efficiency\textsuperscript{24,27,37} in relation to the perceived decrease in the efficiency of health professionals due to EHR.\textsuperscript{68,69}

Healthcare professionals have expressed concerns and frustration about the slowness of the systems\textsuperscript{38,70,71} and the time-consuming nature of clinical documentation.\textsuperscript{14,15,49,72–77,17,20,21,27,34,36,37,47} At the same time, the lack of usability leads to a perceived reduced performance of health professionals,\textsuperscript{15,17,21,37} while the lack of standards, as well have a negative impact on the attitudes and opinions of health professionals. software of the applied EHR.\textsuperscript{32,68}

Nevertheless, the reduced frequency of direct communication between health professionals
can also be recognized as an expressed negative parameter by health professionals,\textsuperscript{14,27} whereas Asan et al.\textsuperscript{78} emphasize the perceived lack of teamwork support. Moreover, the poor integration of workflows with the participation of various health professionals and the poor interface with other health care organizations contribute to an increase in workload.\textsuperscript{15,17,18}

The need for multiple documentation in different systems and double-checking for multiple sources of information also have a negative impact.\textsuperscript{15,67,70,71}

In a related study by Arndt et al.\textsuperscript{79} primary care physicians appear to spend more time interacting with the EHR during and after work hours. In this context, research has documented the negative effect of stress and burnout of physicians in relation to the use of the EHR,\textsuperscript{76,80,81} while the same seems to be true for nurses as well.\textsuperscript{77,80} Additionally health professionals also consider the education, training and learning related to EHR as an additional burden.\textsuperscript{24,34,54}

Besides these, the changing work flow has a negative effect on health professionals in relation to their attitude towards the EHR.\textsuperscript{34,38,48,54,58,67,82,83} In this context Assis-Hassid et al.\textsuperscript{84} underline that possible failures in the design of the EHR create problems in its subsequent functionality as a result of a lack of standardized work flows.

On the other hand, the concerns of health professionals regarding the reduction of time spent with patients and the consequent absence of personalized care are recorded in research.\textsuperscript{22,23,27,34} Also Chao et al.\textsuperscript{21} and Noblin et al.\textsuperscript{24} point out that reduced face-to-face contact makes direct communication between patients and physicians difficult because physicians are busy entering information into EHRs while losing eye contact with patients.

DISCUSSION

The purpose of the present systematic literature review was to investigate the factors that shape positive or negative opinions and attitudes of health professionals in relation to the use of EHR. After extensive literature review in international databases 71 relevant studies were identified.

The findings of these studies show that various factors are related to the formation of positive or negative opinions and attitudes of health professionals regarding the use of EHR. These factors are related either to the work of health professionals, or to data and information management, or to aspects of patient care.

Regarding the work of health professionals, the perceived performance, efficiency, productivity, communication and organization of work in combination with workload lead to the formation of positive or negative opinions and attitudes of health
professionals. Perceived diagnosis and disease management support, as well as clinical decision-making support, have a parallel effect. In relation to data and information, their perceived accessibility, availability, quality and accuracy in relation to their storage and retrieval, as well as the creation of backups, lead to the formation of positive or negative opinions and attitudes of health professionals.

Regarding patient care Increased quality of care, the presence of interdisciplinary communication, communication between health professionals and patients and support of care plans contribute to the formation of positive or negative opinions and attitudes among health professionals. This assertion is supported in combination with the speed and documentation of decision-making, the degree of development of quality indicators and use of standards, the prevention of errors and the perceived financial benefits.

A key finding of the studies is the necessity of monitoring all influencing factors throughout the spectrum of health service provision that have an impact on the successful implementation of EHR and its adoption by health professionals. Also important is the role of existing or non-existent education and training of health professionals and the degree of their support from the authorities in matters of Electronic Health and the use of EHR in particular.

It should also be pointed out that the study of the opinions and attitudes of health professionals should be done both during the design of the EHR system and during its implementation in order to plan and implement appropriate interventions by the policy makers of Electronic Health. Finally, in the studies carried out, the social and cultural context of the health systems in which the health professionals operate must be considered.

LIMITATIONS
The present literature review has some limitations that should be mentioned. First, although the literature review was extensive, it is likely that there are studies that have not been published in scientific journals, which introduces significant bias into the review. In addition, studies published only in Greek and English were reviewed, which means that there may be studies related to the specific topic published in other languages and not included. Furthermore, the degree of correlation with the cultural characteristics of the samples included in the individual studies was not studied.

CONCLUSIONS
The review of the literature led to various findings regarding the factors that shape positive or negative opinions and attitudes among health professionals regarding the use
of EPH. Although the formation of positive attitudes and attitudes outweighs over time some of the countervailing factors such as increased workload and dysfunctional work flows, they seem to have a stability in their negative effect.

Health systems, through eHealth policy designers, must consider the EHR implementation framework as reflected by the formed opinions and attitudes of health professionals as users. This fact will be a critical parameter for the successful implementation of EHR’s technological innovation, that will effectively meet the citizen’s needs for quality.

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