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The Participatory Medicine Attitudes of General Practitioners in Greece: An Information Behaviour Perspective

Petros Kostagiolas¹, Konstantina Martzoukou², Fivos Kakavitsas³, and Dimitris Niakas⁴

¹ Ionian University, Corfu, Greece
pkostagiolas@ionio.gr

² Robert Gordon University, Aberdeen, U.K.
k.martzoukou@rgu.ac.uk

³ Corfu Regional Hospital, Corfu, Greece
fivoskakavitsas@yahoo.gr

⁴ Hellenic Open University, Patras, Greece
niakas@eap.gr

Abstract. General Practitioners (GPs) need to keep up with a wide range of medical conditions and at the same time closely interact with their patients to provide preventive care and health education. This requires effectively sourcing, utilizing, and sharing quality information with their patients as well as creating participatory and shared decision-making health environments. This paper explores the information seeking behaviour of GPs and their attitudes towards participatory medicine (PM). A questionnaire based survey with GPs in Greece, registered with the Hellenic Society of General Practitioners (HSGP) was conducted and included an exploration of three different information seeking dimensions (information needs, sources and barriers) that were associated with GPs' perceptions of PM. The survey results demonstrate an interplay of demographic and contextual factors in the choice of information sources and the barriers encountered and concludes that the effective utilization of online information sources is an essential condition for PM practices.

Keywords: Informations seeking, information needs, participatory medicine, general practitioners, survey, Greece.

1 Introduction

GPs in Greece, similar to other European countries, are specialist doctors, who are not limited to any particular branch of medicine or type of disease and have responsibility for the provision of comprehensive medical care to individual patients who require prevention and treatment of acute or chronic diseases. Central to GPs' relationship with their patients is the sense of community and trust created within their local communities where GPs act as their first port of call within the health system. GPs also offer multiple consultations and have a good understanding of individual patients' medical histories

that enable them to offer advice which they feel is clinically necessary for their patients. On the basis of this knowledge they refer their patients to other specialist health services or/and provide health education, helping them to consult other external credible health information sources. GPs are expected to be familiar with more than 400 distinct clinical conditions (acute or chronic) [1] and to provide a complete spectrum of care within their local communities; however, it is very difficult, if not impossible, for them to be up-to-date in all medical specialties. It is, therefore, paramount that GPs assume full responsibility for continuously updating their knowledge that will allow them to retain the principles that are the foundation for providing effective and safe healthcare to their patients. In order to update this knowledge, satisfy their diverse information needs, and accomplish specific work tasks, GPs engage in information seeking [1], a dynamic and contextual process that relates to the complex nature of their work roles, the time they have available, the effort they are prepared to invest in retrieving information, and the availability of online and offline specific information sources on a subject [3]. Effective information seeking also relies on their own awareness of quality information sources and best practices followed in information retrieval, using different communication technologies and the ability to critically evaluate and share information, known as “digital literacy” [4].

A significant amount of research literature has been devoted to the study of information seeking preferences and information needs of doctors [5-7]. However, the role of effective information seeking practices in participatory medicine (PM) has received little attention. PM has been predominantly examined with an emphasis on patients’ healthcare decisions. Very few studies focused on GPs’ attitudes. Therefore, in this paper we examine the relationship between GPs’ information needs, the information sources they use, digital literacy, and other barriers they experience and their perceptions for PM. Furthermore, a study of GPs in the context of Greece is both timely and important considering the ongoing changes in the general practice health services. In Greece, general practice has only been recognised by the National Health System (E.S.Y.) as a specialty in its own right with requirements for particular training since the end of the 1980s. However, with only 2500 specialist GPs currently in Greece, the nation-wide general practice population coverage is one of the lowest within the Eurozone and accessibility to primary health care services is seriously compromised. This has been further affected by the austerity measures that were introduced since 2010 by the Greek government to address the ongoing financial crisis [8]. In addition, it has only been in the last few years that specialist GPs have been replacing the earlier, non-specialist and newly qualified doctors, and there is still a general lack of trust and confusion by the general population in relation to the advanced level of health services available by GPs.

2 Theoretical Background

This study we used a well-established general model of information behaviour developed by Wilson [9-11]. Wilson advocates a person centered approach focusing on

the information needs and the context, i.e. the situation in which information needs arise, and the barriers that may influence information seeking behaviour. According to Wilson's macro model of information behaviour, information seeking is viewed as an effort to satisfy a set of task related information needs. Although Wilson's model is not particularly focused on health, recent research on the information seeking behaviour of physicians, and GPs in particular, demonstrates the relevance of the model within that context.

GPs are exposed to a wide array of clinical circumstances when compared to other medical specialties [12]. For GPs, information seeking towards the satisfaction of needs is rather subjective and contextual [13], not necessarily implying an exhaustive information seeking strategy [3]. On the contrary, the satisfaction of information needs is viewed as a dynamic process during which doctors assess the medical condition of a patient, determine their information seeking goals and needs, utilize different online and offline information sources, and gradually arrive to an accepted (or compromised) level of information needs satisfaction [14-15]. GPs balance the potential benefits from further information seeking with the related costs in time and effort that should be invested based on the environmental and personal barriers to information seeking they encounter in their own contexts. Indeed, the decision of whether or not extra effort on information seeking is worthwhile is related to the potential benefits from that extra information and knowledge that is available [16]. Information satisfaction is therefore linked to the subjective feeling of having the sufficient amount of information for providing clinical services and making clinical decisions for a specific patient based on his/hers specialized medical condition and views on what is best for them. In addition, although the primary motivation for information seeking is related to reducing uncertainty in a clinical problem [17], in some occasions GPs are motivated to seek information in order to legitimize the information gathered by patients [18-19]. Effective information exchange and information sharing empowers a consultation style that is curious, supportive, non-judgmental, and based on patient participation in clinical decision making [2]. Although the actual clinical consultation may take longer, the additional time spent engaging the patient in the decision improves the clinical decision quality [20].

3 Survey Details

We conducted this research conducted by means of a questionnaire survey that was informed by Wilson's macro model of information behaviour [16], [19], [21]. The first section included questions about demographic characteristics of GPs (e.g. age, healthcare unit, workplace, and specialization). The following sections measured the importance of work related information needs (8 items), the frequency of different information resources utilization (13 items) and the importance of barriers that GPs face when seeking information (8 items). The last part of the survey questionnaire was concerned with the perceptions of the GPs for practicing participatory medicine and

was informed by the work of Coulter & Collins [2] for shared decision-making in the National Health System (NHS) in the U.K. It measured the importance of doctor-patient relations on the basis of the following areas: “development of understanding and trust”, “deciding in common the agenda and priorities”, “sharing information”, “communication for reducing patient anxiety”, “supportive actions” and “explaining evidence-based alternatives” (6 items).

We distributed the questionnaire via email, fax, or regular post to a total of 664 GPs in Greece registered to the Hellenic Society of General Practitioners (HSGP). It was distributed mainly via email, fax and regular post, according to the registered GPs' correspondence details. One hundred and seventy six GPs returned the questionnaire, achieving a 26 per cent response rate. Prior to its distribution, the questionnaire was qualitatively pilot tested by a group of experts (medical doctors with extended research background and academics) for validity and was approved by the HSGP scientific committee. The survey was advertised on the HSGP webpage and took place during the period of February to March 2014. We used a 5-point Likert scale to rate the frequency of information needs, the frequency of utilization of specific information sources, the importance of specific obstacles during information seeking, and the GPs' attitudes towards PM practices. The values assigned to the five item Likert scale ranged from 1= “not at all” to 5= “a lot.” The 35-item questionnaire scale exhibited a good internal consistency with an overall Cronbach alpha of 0.824 and no variable influencing the scale mean and the overall Cronbach alpha, if it was to be removed from the model. Furthermore, the reliability of each subscale was found to be as follows: “the importance of information motives/needs”=0.737; “the frequency of information sources employed”= 0.789; “the importance of the barriers involved in seeking information”= 0.790; “the importance towards participatory medicine” = 0.792. The subscales were adequate [22] in terms of their internal consistency with no problematic variables in terms of Cronbach alpha reliability coefficient as judged by item-total statistics. We performed statistical analysis using SPSS and based on descriptive and nonparametric inferential statistics (Mann-Whitney-U and Kruskal-Wallis-H for the group categories) and associations (Spearman's rho test) of different categories of information needs, sources, and barriers, and the doctors' perceptions for PM.

We conducted the survey within a specific socioeconomic environment. Thus, the results should be generalized with caution as they may not be directly applicable in other settings and countries. One of the limitations of the study was also the low response rate and the demographic sample synthesis that consisted of younger GPs. This could be due to the way in which the questionnaire was distributed (predominantly through email) as younger doctors may be prone to using email for communication with other professionals and friends on a more regular basis than older doctors. However, the analysis provides a useful insight into the information needs, information sources preferences and barriers experienced by GPs in relation to their PM perceptions and may be useful for follow up research studies that aim to further explore these issues in other settings.

4 Survey Results

4.1 Descriptive Statistics

One hundred and seventy six GPs initially returned the questionnaire since two participants had to be excluded from the study due to inadequate completion, bringing the final sample to 174 GPs. The majority of the sample comprised of relatively young doctors (less than 55 years old – 64.4 percent of the sample). Most of the doctors had completed their specialization (62.1 percent of the sample) and, at the time of the survey, were working at a public hospital outpatient clinic or at a healthcare centre. Table 1 summarizes the sample profile..

Table 1. Sample profile

Demographic characteristics	Frequency	Percentage
Age		
Less than 40 years old	112	64.4
41-55 years old	56	32.2
More than 55 years old	6	3.4
Workplace		
Hospital Outpatient Department	46	27.4
Healthcare centre	60	35.7
Health insurance medical centre	5	3.0
Private GP	15	8.9
Specialization		
Yes	108	62.1
No	66	37.9

Table 2 shows the responses given with regard to their information needs/motives. The GPs reported that their most frequently information needs were centred on diagnosis, treatment, knowledge updating, and drugs.

Table 2. Survey results of GPs' information needs/motives

Information motives/needs	Level of importance (<i>the value 1 in the scale indicates low importance and the value 5 high importance</i>)				Valid N
	Low (1 & 2)	Medium (3)	High (4 & 5)	Median	
Diagnosis	7.5%	3.4%	89.1%	5.0	174
Treatment	3.4%	5.8%	90.8%	5.0	173
Knowledge updating	3.4%	6.9%	89.7%	5.0	174
Drugs	1.7%	14.3%	84.0%	5.0	175
Patient material	14.5%	25.7%	59.8%	4.0	167
Epidemiology	19.6%	31.2%	49.2%	3.0	173
Research	20.8%	20.2%	59.0%	4.0	173
Teaching	25.5%	16.6%	57.9%	4.0	169

Table 3 presents the survey results for the information sources utilized by the GPs. The most frequently used information source was Internet general search engines, followed by guidelines, scholar databases, and the doctors' personal libraries.

Table 3. Survey results of the information sources utilization

Information sources	Level of utilization (<i>the value 1 in the scale indicates low utilization and the value 5 high utilization</i>)				Valid N
	Low (1 & 2)	Medium (3)	High (4 & 5)	Median	
Personal library	11.0%	14.5%	74.5%	4.0	173
Colleagues	16.4%	25.7%	57.9%	4.0	171
Hospital library	67.9%	8.90%	23.2%	1.0	168
Scholar databases	12.7%	12.1%	75.2%	5.0	173
General search engines	5.80%	11.6%	82.6%	5.0	172
Medical websites	18.6%	13.4%	68.0%	4.0	172
Updating services	19.2%	18.6%	62.2%	4.0	172
Guidelines	5.70%	17.0%	77.3%	4.0	171
Electronic medical journals	32.7%	19.6%	47.7%	3.0	168
Printed medical journals	43.8%	26.6%	29.6%	3.0	169
Medical conferences/seminars	14.4%	25.3%	60.3%	4.0	174
Pharmaceutical representatives	44.8%	27.3%	27.9%	3.0	172
Mass media	78.6%	8.3%	13.1%	2.0	168

Table 4 presents the survey results in terms of the barriers GPs encounter when seeking information. Notably, lack of time was the most significant obstacle encountered, followed by cost and the abundance of information that may be perceived as GPs experiencing information overload issues.

Table 4. Survey results of GPs' obstacles when seeking information

Obstacles when seeking information	Level of importance (<i>the value 1 in the scale indicates low importance and the value 5 high importance</i>)				Valid N
	Low (1 & 2)	Medium (3)	High (4 & 5)	Median	
Lack of time	12.9%	21.8%	65.3%	4.0	170
Cost	21.3%	19.5%	59.2%	4.0	169
Lack of libraries	49.1%	21.9%	29.0%	3.0	169
Lack of digital literacy skills	65.9%	12.9%	21.2%	2.0	170
Lack of computer skills	70.3%	10.7%	19.0%	1.0	169
Lack of trust in online information	65.2%	12.6%	22.2%	2.0	167
Abundance of information	34.1%	25.9%	40.0%	3.0	170
Information in foreign language	58.3%	12.9%	28.8%	2.0	170

Table 5 presents the survey results in relation to GPs' perceptions of participatory medicine. In accordance with the theoretical framework chosen [2], the most highly valued aspects of participatory medicine was the development of understanding and trust between GPs and their patients, followed by its value for explaining evidence-based alternatives, sharing information, and communicating with patients to reduce their levels of anxiety.

Table 5. Survey results of GPs' perception of participatory medicine

Participatory medicine issues	Level of importance (<i>the value 1 in the scale indicates low importance and the value 5 high importance</i>)			Median	Valid N
	Low (1 & 2)	Medium (3)	High (4 & 5)		
Development of understanding and trust	3.60%	8.30%	88.1%	5.0	168
Common agenda and priorities	7.80%	24.6%	67.6%	4.0	167
Sharing information	12.2%	18.9%	68.9%	4.0	164
Communication for reducing patient anxiety	10.2%	18.9%	68.9%	4.0	166
Supportive actions	11.0%	23.8%	65.2%	4.0	164
Explaining evidence-based alternatives	9.50%	14.8%	75.7%	5.0	169

4.2 Correlations Between Information Needs, Sources, Barriers and Participatory Medicine Dimensions

We performed a number of correlations between three main dimensions (information needs, sources and barriers), the demographic characteristics presented in Table 1, and the dimensions of participatory medicine (Table 4). In relation to the different levels of information needs presented in Table 1, the Mann-Whitney (U) test did not reveal any significant differences on the basis of a specific area of expertise (specialisation) or between different levels of information motives/needs and the different age groups of GPs. However, using the Kruskal-Wallis test we identified significant differences ($H(4)=14.204$; $p=0.007$) between GPs working in different working contexts and the frequency of information seeking for research purposes. In particular, GPs working in hospital outpatient departments (mean rank=81.17), healthcare centres (mean rank=87.12), and health insurance medical centres (mean rank=90.80) searched more frequently for research based purposes than those who were working in private GP services (mean rank=43.57).

We found a number of additional interesting associations in relation to the group demographics and the utilization of information sources. The Mann-Whitney U test identified ($U=2766.00$, $p=0.037$) that the group of physicians without a specialization (mean rank 95.28) employ "colleagues" as an information source more often than those with a specialization (mean rank 79.59). In addition, the Kruskal-Wallis test identified significant differences among GPs within different age group categories in terms of the frequency of using "updating services" as information sources ($H(2)=6.05$, $p=0.049$) with mean rank values 106.17 for GPs in the age group above 55 years old, 91.11 in those between 41 to 55 years old, and 73.57 in those who were younger than 40 years old. Finally, the Kruskal-Wallis test found statistical significant differences among GPs who turn to "colleagues" for information within different workplace environments ($H(4)=10.547$; $p=0.032$). Specifically, hospital outpatient departments had a mean rank of 96.91, healthcare centres had a mean rank of 81.87, health insurance medical centres had a mean rank of 101.20 and private GP services had a mean rank of 59.8

The Mann-Whitney U test identified ($U=2435,5$, $p=0.001$) that the group of physicians with a specialization (mean rank 95.28) perceive the “lack of digital literacy skills” as a more significant barrier than those without specialization (mean rank 76.20). In addition, we found significant correlations between a number of barriers experienced by GPs and their different workplace contexts: the “lack of digital literacy skills” ($H(4)=10,526$, $p=0.032$); the “lack of computer skills” ($H(4)=14,006$, $p=0.007$); and the “lack of trust in online information” ($H(4)=9,480$, $p=0.050$). The mean ranks of these barriers for GPs working within hospital outpatient departments were 96.93, 89.51 and 87.89 respectively. The mean ranks of these barriers for GPs working within health insurance medical centres were 88.30, 73.70 and 65.20 in relation to the three barriers, while for those who worked within healthcare centres the mean rank values were 85.71, 75.61 and 71.02 respectively. The lowest scores to these barriers were assigned by those working in private GP services with a mean rank of 57.97, 50.50 and 61.67 in the three different areas of barriers.

We identified statistical significant differences via the Kruskal-Wallis test among GPs who belong to different age groups and the value they place on participatory medicine as a means for “explaining evidence-based alternatives” ($H(2)=6,941$, $p=0.031$). Participants below 40 years old had a mean rank of 89.37, those between 41 to 55 years old had a mean rank of 80.38, and those above 55 had a mean rank of 38.80. However, we identified additional significant associations between the three information seeking behaviour dimensions (information needs, information sources and barriers) and GPs’ perceptions of the different levels of value of participatory medicine using Spearman's rank nonparametric correlation coefficient. In relation to the different layers of information motives/needs we explored, the Spearman's correlations indicate that those who assigned value to PM as a means for setting a “common agenda and priorities” had information needs based on “diagnosis” ($r_s=0.193$, $p<0.05$) and “patient material” ($r_s=0.194$, $p<0.05$). In addition the value of PM for “sharing information” was positively associated with information needs based on “knowledge update” ($r_s=0.270$, $p<0.005$) and “drugs” ($r_s=0.189$, $p<0.05$). The value of PM as a means for enabling “communication for reducing patient anxiety” was correlated with information needs for “therapy” ($r_s=0.179$, $p<0.05$). Finally, the significance of PM for “explaining evidence-based alternatives” was associated with “diagnosis” ($r_s=0.226$, $p<0.005$).

In terms of the information sources utilized, “scholar databases” were positively associated with the value GPs assigned to PM for the “development of understanding and trust” ($r_s=0.165$, $p<0.05$) and for “information sharing” ($r_s=0.196$, $p<0.05$). “Scholar databases” were also associated with PM as a means for setting a “common agenda and priorities” ($r_s=0.195$, $p<0.05$). The use of “medical websites” was associated with PM as a valuable means for developing a “common agenda and priorities” ($r_s=0.160$, $p<0.05$) and was perceived valuable on the basis of “communication for reducing patient anxiety” ($r_s=0.173$, $p<0.05$). The use of “general search engines” was significantly associated with the value assigned to PM in “supportive actions” ($r_s=0.171$, $p<0.05$), in “guidelines” ($r_s=0.325$, $p<0.005$). The value of PM on the basis of “communication for reducing patient anxiety” was positively correlated with a number of different information sources, “medical websites” ($r_s=0.173$, $p<0.05$), “updating services” ($r_s=0.158$, $p<0.05$), “guidelines”

($r_s = 0.160$, $p < 0.05$), and “electronic medical journals” ($r_s = 0.209$, $p < 0.005$). Finally, it should be noted that we found a negative association between the frequency of using “updating services” as information sources and the value of PM in the “development of understanding and trust” ($r_s = -0.198$, $p < 0.05$). In relation to the intervening variables, we found an additional negative correlation between the “lack of digital literacy skills” barrier and the value of PM in setting a “common agenda and priorities” ($r_s = -0.166$, $p < 0.05$). In addition, the barrier based on “lack of trust in online information” was similarly negatively correlated with the value assigned to PM as a means for “information sharing” ($r_s = -0.172$, $p < 0.05$). Thus those participants who experienced these barriers were less likely to perceive the value of the above PM dimensions.

5 Discussion of Results

Our study results are in line with other similar studies of GPs that found that they mostly seek information in relation to ‘treatment’, ‘diagnosis’, and ‘drugs’ [23-24]. We also found that Internet information sources play a catalytic role in GPs’ daily activities. Therefore, in correspondence with previous research [25], our survey suggests that Internet information sources (particularly Internet general search engines and scholar databases) are key sources. However, we also found that other more traditional sources such as guidelines and GPs’ personal libraries are also still prevalent. Thus, GPs prefer to use a combination of online and traditional information sources. In relation to PM, overall, GPs expressed a quite positive attitude, especially for the “development of understanding and trust” and for “explaining evidence-based alternatives” practices. We found a number of positive associations on the basis of the different PM dimensions with the frequent use of Internet sources including scholar databases, medical websites, general search engines, updating services, and electronic medical journals. This demonstrated how the Internet can play a pivotal role in establishing successful PM practices based on principles of understanding and trust, information sharing, developing a common agenda and priorities together with patients, enabling communication with the purposes of reducing patient anxiety, and taking supportive actions. The use of additional, information technologies, including telemedicine applications over the Internet could play an important role in establishing better communication and, therefore, delivering more effective primary healthcare within patients’ communities. However, as more and more patients utilize Internet information sources and networks in order to seek information on health issues and/or share experiences within complex social information networks, it is important for GPs to not overlook all those who are still reluctant to use modern information technologies to access and exchange information. GPs will need to have developed an advanced level of digital literacy skills through practical and theoretical training [26] that will enable them to efficiently use them. GPs will need to become familiar with online information seeking practices and embed various online information sources as part of their clinical decisions (e.g. evidence-based medicine, guidelines) as well as within their participatory medical practices. For the later, they should also be in a position to educate

and consult their patients on the basis of using specific information sources developed by trustworthy organizations and associations for specific health conditions.

6 Conclusions

GPs play a rather crucial role in the chain of primary care services provision. On a more theoretical basis, we proposed the adoption of a popular information seeking macro-model developed by Wilson for the purposes of studying the GPs' information seeking behaviour. The survey results indicate the importance of information seeking preferences in satisfying GPs' knowledge intensive daily practices, which involves an extensive array of medical conditions from different medical specialties. Overall, the utilization of a range of information resources is positively associated with the values assigned to participatory medical practices. Our survey results also indicate that there is an association of PM practices with the utilization of online information sources and with the need for diminishing obstacles (contextual and personal) that GPs face when searching for information online. The use of a combination of information sources allow GPs to update their knowledge and support their personal development goals and therefore offer effective evidence based medical practices that are at the core of their role in promoting and supporting the development of healthy communities. Consequently, digital literacy programs are essential for GPs for providing them with the necessary skills for identifying their work related information needs, for efficiently searching for information on different online information sources, for critically evaluating the online information they retrieve and the sources they use and for efficiently managing and using health information in an ethical manner to present, communicate, and share information with their patients in evidence based PM practices. Thus information and digital know-how should be integrated in GPs' education and continuing professional development as a core set of skills. This becomes increasingly important as GPs assume novel roles on the basis of guiding their patients and their medical concerns in the digital age.

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