



PRACTICAL APPROACH TO STUDY MEDICAL DOCTORS HABITS AND ATTITUDE TO INTERNET

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ABSTRACT

The purpose of this paper is to investigate the level of Internet usage among the medical doctors in Bulgaria. The study was conducted within six towns in Bulgaria, with different structure and population. A direct face-to-face interview with medical doctors – general practitioners and specialists were performed. Statistical analysis using descriptive statistics and chi-square tests were performed. Almost all physicians in Bulgaria use Internet, although not so often – ¾ use Internet less than 10 hours per week. The majority claim to use Internet for their professional needs, as well as entertainment and communication. The survey shows the growing importance of Internet for the Bulgarian physicians and the impact on their daily practice and education. Almost all medical doctors in Bulgaria access to the Internet. Most of them use the Internet for information retrieval in their daily practice. Increasing the confidence in the published information is one of the main areas for future development.

Keywords: Internet, Bulgaria, physicians.

INTRODUCTION

Internet has revolutionized the delivery of information worldwide. It cannot be denied that it has also rediscovered health and medical education in the context of communication and information access. From the average user to the medical doctor, health information is among the most frequently searched topics on the Internet. In search by category it is a leading topic in more than 80% of all users.

As part of the global trend more doctors and medical professionals use the Internet. Internet is used for administrative purposes by most medical doctors such as document and data processing, but also to provide professional training and education materials. There is an on-going broader shift from the conventional methods of medical teaching and practice into the world of dotcom and Internet.¹ Since 1996 the use of the Internet as a valuable resource in this area is constantly increasing, in recent years there is a surge of over 50%. Healthcare professionals, as well as medical universities and professional organizations seek new ways to reduce costs and increase effectiveness of the education.

Research conducted in the U.S. shows that 61% of Americans (adults) use internet to search for health related topics². Also, 45% of adult U.S. Internet users are using the web to find or recall information about medicines (prescription or OTC).

The number of patients and doctors using the Internet for medical information is on the rise. Problem, however, is the fact that much of the information on the Web is uncontrollable - therefore prudence have priority in making decisions based on this information. The Institute of Medicine in America (The Institute of Medicine-IOM) said: "The Internet is like the Wild West: there are huge

barriers of unmarked territory and no one is responsible for it".³

Due to the uncontrolled nature of the Internet it is very important to have rigorous evaluation of the information obtained in this way. A significant number of resources (tools) to evaluate the quality of information on websites is available, but many of them are difficult to use. They are not easily accessible or contain complex elements that make use ineffective. The usability, reliability and validation of the currently available methods are unclear.⁴

There are consultations to evaluate the content of the Internet, led by National Institutes of Health (NIH)⁵. Although this tutorial is intended for patients, health professionals can also benefit from it.

While 49.5% say they prefer their doctor as the first source of health information according HINTS (Health Information National Trends Survey), it is 48.6% actually consulted first to Internet.⁶ This observation was confirmed in another study, which showed that approximately 23% to 31% of health professionals reported that over 80% of their patients are using Internet as source of information.⁷ Some earlier studies have shown that few patients actually visit websites recommended by their doctors. More recent research, however, shows that almost 90% of the patients believe that their doctor should refer them to health information on the Internet.⁸⁻¹⁰ And although many people use the Internet for health information, the majority (86%) are still turning to professionals in the health field to help in dealing with health problems.¹¹

European Commission publishes the results of a European survey on electronic services in healthcare, which found that 87% of general practitioners (GPs) in Europe use a computer, 48% with a broadband connection.¹² Doctors



and pharmacists in Europe are increasingly storing, receiving and sending electronic data to patients, such as laboratory results, prescriptions, clinical and diagnostic findings. In using such eHealth applications, doctors and medical service providers have already improved healthcare in Europe. Implementing more efficient administration and shorter waiting times for patients; exchanging medical information and prescriptions; providing additional services etc. In Bulgaria, on average about 97% of GPs use a computer in their daily practice, as per cent of group practices is almost 100%.

48% of Bulgarians use Internet. Bulgaria has the fastest average Broadband Internet speed in the world after South Korea and Romania.¹³

The research model and hypotheses

A direct individual survey with a questionnaire was performed, based on formation of non-systematic cluster sample (pseudo-randomization) among Bulgarian doctors – GPs and specialists in primary care.

The study involves several steps: preparatory stage, field study and final stage. The first stage included literature research, development of training materials for the interviewers, selection of interviewers to conduct field study and collection of expertise; selection of study participants.

The actual study (field work) was conducted in Q4 2011. Final stage was analysis of the results and preparation of scientific communication of the results.

With this research we wanted to better understand the level of Internet penetration among medical doctors in Bulgaria. We wanted to answer the two study questions: "What is the doctors attitude and habits to use Internet?" and "Do they regard it as a source for professional information". Based on the literature research and authors' personal experience, we expected high level of Internet penetration among the doctors, but limited interest in professional topics. Also based on previous studies, we expected doctors under 35 years old and those with younger patients (paediatricians) to have much higher level of Internet usage.¹⁴

We wanted this study to be a basis for future more detailed research on the impact of on-line educational campaigns directed towards medical professionals.

MATERIALS AND METHODS

Based on data from the Bulgarian Medical Union there are 34,721 registered medical doctors in Bulgaria.¹⁵ To determine the sample size we used module of the program Epi Info – Statcalc. It is known from the statistical theory that the sample size is largest for proportions.¹⁶ At confidence level of 95%, a proportion of 5% and risk of error 1%, the sample size was calculated to 114 people; to which 5% was add to compensate for possible failures and invalid questionnaires.

The number of doctors interviewed was 120 and they are randomly selected in six districts in Bulgaria. The split was based on population data from the Bulgarian National Statistics Institute from 2010¹⁷ – a half in the capital city – Sofia (population: 1 174 515) and the rest in Blagoevgrad (population: 70 259); Kustendil (population: 45 431); Montana (population: 44 602); Vratsa (population: 59 870); Ruse (population: 155 818). In each town equal number of GPs and specialists were interviewed.

Physicians to be tested in each area were divided equally between GPs and specialists for the following reasons:

1. Specialists treat patients with relatively complex diagnoses;
2. Specialists in primary care use more specific medicines in a therapeutic group;
3. In general, specialists are more familiar with new and modern medicines that have not yet gained popularity in the general practice.

Statistical analysis using descriptive statistics and chi-square tests were performed.

RESULTS AND DISCUSSION

The majority of the interviewed are aged over 46 years – 75% of all (Figure 1). This actually represents the current age demographics of the medical doctors in Bulgaria. Only 7% of all physicians are between 30 and 40 years old. Around half (53%) of all interviewed are in the range of 46-55 years old. The mean age of the respondents is 50.29 (range 28-72, SE mean=0.687).

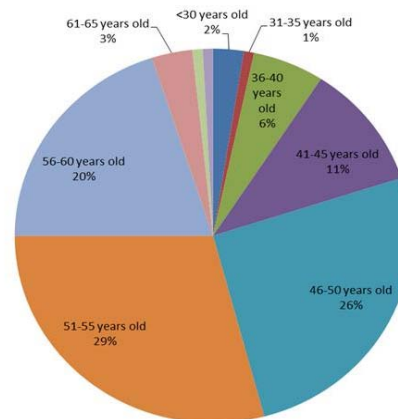


Figure 1: Interviewed doctors grouped by age

The variable that is in close relation with the age of the respondents is their professional experience. The mean length of the respondent's experience is 24.66 years (range 2-50, SE Mean=0.732). More than a half (54%) of all participants' experience is 21-30 years. Every fifth doctor (20%) has been working for 31-40 years.

Interesting finding is that the doctors under 40 are concentrated in the larger cities (Sofia, Ruse, and Blagoevgrad) and in the medium sized (Montana and Kustendil) the age is over 46 and this corresponds to the territorial structure of the population.

The biggest share of the doctors, included in the survey (89%) have post-graduate specialty. The most frequent specialty among GPs is Internal medicine (42%) and among specialist is Obstetrics and gynaecology (15%).

Most of the medical doctors are female (63%) vs. 36% male. Out of the female doctors, 56% practiced as GP's and from the male group this was 42%. Most of the men practiced as specialists (58% of the interviewed). More than 4/5 of the surveyed doctors (85%) reported that over 50% of their patients are adults and only 12% were working predominantly with children.

About half of the physicians claimed to have between 10 and 20 patients per day (48% of all), and 23% said that they have between 20 and 30 patients per day (Figure 2). The number of the patients per day is not very similar between the GP's and specialists. The specialists have less patients per day – 30% of the specialists examine less than 10 patients per day vs. only 6% of the GP's and about 42% of the GP's have more than 20 patients per day, vs. 16% of the specialist. This difference is significant, Cramer's V=0.473, p<0.0001.

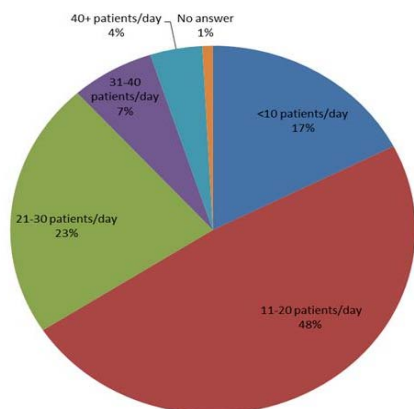


Figure 2: Average number of patients, reported by the interviewed doctors

A. Time spent on the Internet

According to ITU, in June 2010 in Bulgaria there were 3,395,000 Internet users as, which is 47.5% of the population¹⁸, and almost all doctors in Bulgaria use Internet. The fact that the largest payer in the pharmaceutical and healthcare segment in Bulgaria (The National Health Insurance Fund) has almost all of its features online is one of the major drivers for the doctors to explore Internet.

On the question "How many hours per week do you use Internet?" only 2% said that they do not use Internet. Majority of the interviewed (63%) reported that they use Internet between 1 and 10 hours per week. One quarter (24%) responded that they spent on the Internet more than 10 hours per week.

The average time spent on the Internet per day is not similar in all cities (Figure 3). Interesting fact is that in the medium sized cities, more than 50% of the doctors are on Internet more than 10 hours/week. The difference

between the regions is significant (Cramer's V=0.307, p<0.005).

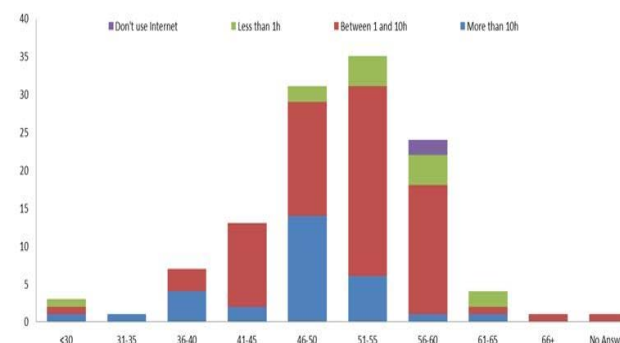


Figure 3: Split per age group on how many hours per week doctors use Internet

As far as the age is concerned, it is obvious that the older doctors are less they use Internet.

There is a slight but significant difference between (Cramer's V=0.336, p<0.05) the age groups of the participants: the youngest doctors (up to 40 years old) tend to spend more time on the Internet – more than 10 hours weekly; medium-aged participants (41-60 years old) more frequently use the Internet between 1 and 10 hours weekly. 100% of the non-users are in the age group 56-60.

There is no major deviation in the time spent on the Internet, between doctors with and without specialty and the difference is not significant.

Specialists spend relatively more time on Internet compared to GP's. Although the split in average time on Internet per week is pretty similar 16% of the GP use Internet less than 1 hour per week, vs. 8% from the specialists (less than 1 hour/week or not at all). See Figure 4.

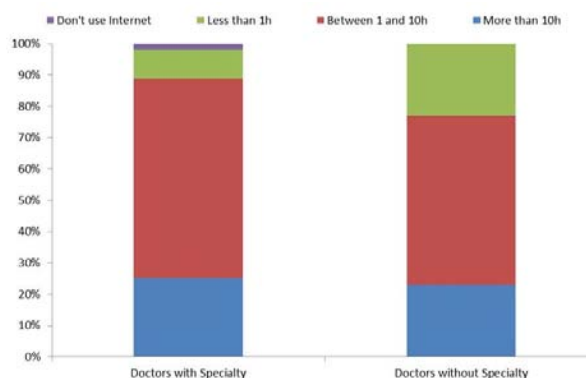


Figure 4: Split per specialty on how many hours per week doctors use Internet

Based on the answers we can say that male doctors use more often Internet compared to female even though the difference is not significant (p>0.05).

15% of the women use it less than an hour a week in contrast to only 2% of the men. And more than 33% of the men use Internet more than 10 hours per week vs. 19% in women.

Doctors with less than 10 patients per day using Internet less than an hour per week are only 5%, in comparison to those with 30-40 patients per day, where 25% use Internet less than an hour per week.

B. What do the doctors use the Internet for?

86.7% of all doctors claim that they look for professional information on the Internet. Most of the participants from small cities search professional information on the Internet, compared to 85% of their colleagues in Sofia and only 50% in Ruse. The difference is significant (Cramer’s V=0.407, p<0.005). See Figure 5.

The other factors (gender, age, specialty, etc.) don’t have statistically significant influence on the professional information searched on the Internet.

Nearly 2/3 of all respondents (69%) use the Internet for other (non-professional) information. There are no significant differences in the groups (gender, age, specialty, etc.)

76% of the doctors use Internet at home and mostly for entertainment and social networking.

One third of all participants (32%) use Internet for entertainment (movies, music, games, etc.).

Almost half (43%) of the respondents reported that use the Internet for social networking. The respondents from Vratsa tend to do so more frequently compare to these in Sofia. The difference is significant (Cramer’s V=0.346, p<0.05).

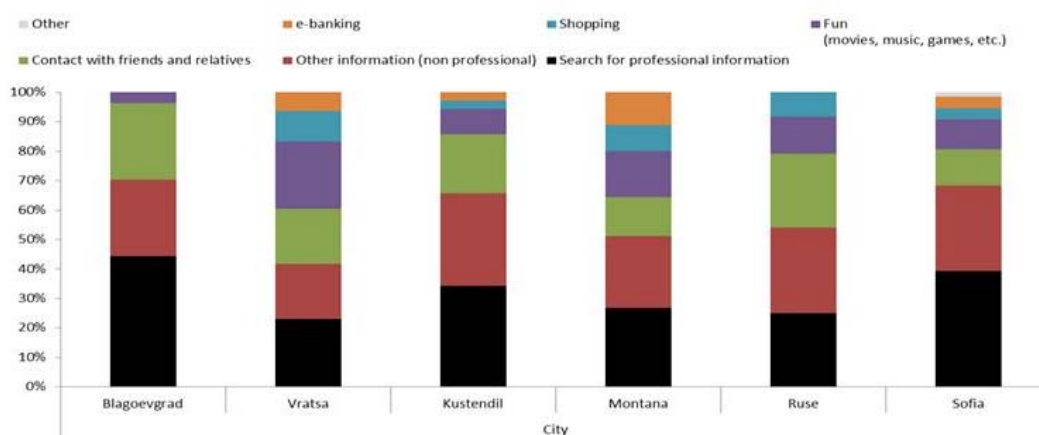


Figure 5: Reasons for doctors to use Internet in different cities

Table 1: Credibility of the information on Internet, according to the interviewed doctors (per city)

Do you think that the information in Internet is credible and useful for your professional practice?	City						Total
	Blagoevgrad	Vratsa	Kustendil	Montana	Ruse	Sofia	
Yes	4	0	2	6	1	15	28
	33,3%	0%	16,7%	50%	8,3%	20%	23,3%
Some of it	8	12	10	6	7	35	78
	66,7%	100%	83,3%	50%	58,3%	58,3%	65%
No	0	0	0	0	4	8	12
	0%	0%	0%	0%	33,3%	13,3%	10%
No answer	0	0	0	0	0	2	2
	0%	0%	0%	0%	0%	3,3%	1,7%
Total	12	12	12	12	12	60	120
	100%	100%	100%	100%	100%	100%	100%

C. Where do the doctors use internet most often?

About 1/3 of the physicians don’t tend to use Internet at their daily practice, but at home or other location. In the group using Internet less often (less than an hour/week) this percentage is 15%.

Out of the doctors who don’t use Internet at work, 37% don’t use it for professional information, too. On the other hand 78% of them say that they use Internet for social and professional networking.

Two thirds of the respondents (71%) use the Internet in their workplaces. This is less frequently reported by the doctors from the capital city then the others. The difference is significant (Cramer’s V=0.350, p<0.05).

There are some differences between the doctors, using Internet at their work place according the number of their patients. Cramer’s V=0.313, p<0.05.

Nearly ¾ of the respondents (76%) use Internet at home. This is more indicative for the doctors from small cities than for the others (Cramer’s V=0.307, p<0.05). Only 4% of the participants use Internet while they travel/commute.

D. Do the doctors use information they have learnt from Internet in their daily job?

Only a quarter (28%) of the participants reported usage of the information they learnt from Internet at every stage of patients' treatment. This is more often reported by the



doctors from the city of Kustendul (Cramer's $V=0.412$, $p<0.001$).

Every 12th respondent use the information he/she learnt from the Internet mainly while diagnosing.

Less than a half (39%) of the surveyed doctors reported usage of the information they learnt from the Internet mainly when prescribing medicines. This happens more often in only one city (Vratsa) than in the other towns (Cramer's $V=0.355$, $p<0.01$).

Only 18% of the respondents never use the information they learnt from the Internet in their daily job. (Cramer's $V=0.393$, $p<0.05$).

E. Do the doctors use non Bulgarian Internet sites (in other languages)?

More than a half (58%) of the respondents uses other language web-sites for professional information.

Every third respondent (38%) searches for other information in foreign-language web-sites. This happens more frequently in small cities like Vratsa and Montana (Cramer' $V=0.532$, $p<0.001$).

The doctors whose patients are predominantly children or are equally distributed adults and children tend to search for the other information in foreign languages sites (Cramer's $V=0.269$, $p<0.05$).

Quarters (26%) of all doctors do not use foreign language web-sites at all. A half of the respondents in one small city and a third in the capital Sofia do so (Cramer's $V=0.328$, $p<0.05$).

F. Do the respondents think that the information on Internet is credible and useful for their professional practice?

Two thirds of the respondents (65%) think that only some of the information on the Internet is credible and useful for their professional practice, every tenth participant (10%) does not trust the information, obtained from the net; one quarter (23%) believes that the Internet is trusted source of information for their practice.

The respondents from the capital city more often trust the Internet (Cramer's $V=0.270$, $p<0.05$). (Table 1)

Discussion

In this study we evaluated physicians' self reported reasons for using the Internet. When designing the study, we wanted to find out what the habit is and how much medical doctors in Bulgaria use Internet. The small sample size we had could result in underestimation of the inspected relations (Chi-square method restrictions), but creation of a sample which is representative at regional level is not cost effective.

Before initiating the study, we did not expect huge penetration, especially in the smaller cities. The results disproved this and showed that most doctors use Internet

daily and that in the smaller cities the usage is even higher.

Based on the replies from the interviewed doctors it is obvious that the Internet is already one of the most important sources of information for the Bulgarian physicians.

Although majority of the interviewed use Internet to search for professional information (87%), most do not consider the information credible enough. This is one of the disadvantages of the free access to the virtually unlimited information on the Internet – everyone can create content and no one is controlling its quality. This could be even life-threatening in some cases, as 1/3 of the physicians use the information from the Internet, at every stage of patients' treatment. Almost 40% of the doctors use the information for the medicines they prescribe.

Increasing the reliability of the medical information is of paramount importance. Another opportunity could be development of an online system, which automatically advice the recommended treatment regime (using national guidelines), based on the diagnose. Such system could have significant beneficial impact on the safety, effectiveness and help bring down the costs of the treatment.

Only limited number (about 1/10) of the interviewed said that are using Internet for non-professional purposes. We think that this is an indicator that they don't utilise the full potential of the net and a detailed qualitative study should be performed on this topic.

Professional healthcare institutions and service providers could use the results of our study as the basis for future initiatives. Future studies should benefit and use the current data as basis and compare characteristics, trends and development of the Internet usage among other medical professionals. We also suggest exploring the impact of on-line educational campaigns directed to medical professionals vs. conventional one. Such studies should also include the cost-effectiveness analyses.

CONCLUSION

The survey shows the growing importance of Internet for Bulgarian medical doctors. Almost all physicians in Bulgaria use Internet (98%), although not so often – $\frac{3}{4}$ use Internet less than 10 hours per week. It is already one of the core sources not only for vocational information but also for social and internal professional networking. This could give a great opportunity for professional and healthcare institutions to use it even more as platform for education, training and optimization of the daily work. The wide usage of the Internet sites in foreign languages, gives to the doctors much better perspective and timely access to the latest and most updated information.

The widespread use of the Internet as a tool for health and medical information is fact and healthcare



professionals should also guide patients to where they can get reliable information on the web.

There is still quite a lot to be done in order to win doctor's trust, confidence in the information posted on Internet, as most of the doctors have doubts about the information they find in the net, and 1 in 10, does not trust anything he/she reads on Internet.

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