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The internet as a source of medicines information (MI) among frequent internet users

Abstract

Background: The internet is widely and increasingly used to search for health information. Previous studies have focused mainly on health information in the internet in comparison to medicines information (MI).

Objectives: The aim of this study was to explore internet as a source of MI compared to other sources of MI; to identify those who use the internet as a source of MI; and to describe patterns of use of the internet as a source of MI.

Methods: A cross-sectional internet-based questionnaire was posted by patient and other organizations as well as pharmacies on their websites during six weeks in the beginning of 2014. Logistic regression analysis was used to assess associations of background variables to the use of different MI sources.

Results: The most used MI sources among respondents (n=2,489) were package leaflets (90%), pharmacists (83%), physicians (72%), and the internet (68%). According to a multivariate analysis, internet use for MI was associated with female gender, age < 65 years, higher education, daily use of the internet, and continuous use of vitamins or herbals. MI was most commonly searched from a Finnish health portal (56%) and websites of pharmacies (41%). Of the respondents, almost half (43%) used search engines to find information from the internet. The names of the medicinal product, symptom or disease were the most commonly used search terms.

Conclusions: Well educated, young women tend to search MI from the internet. Health care professionals should discuss about reliable MI websites and tools which can help patients to evaluate the reliability of the information.

Internet as a source of medicines information (MI) among frequent internet users

Introduction

The internet is widely and increasingly used to search for health and medicines information. [1-5] Medicines information is among the most commonly searched topics of health information online along with, e.g., searching information about a specific disease or medical problem or how to lose or control your weight .[5] In Finland, 9–20% of the medicines users had used the internet to access information on their medicines.[6-8] Based on the results of previous research, however, an interpretation can be made that the internet is not replacing health care professionals as a source of health and medicines information.[2,3,6,8] Instead, it has been recognized that internet is often used to complement other sources.[7,9]

Previous research suggest that finding and assessing relevant information from the internet is problematic, which may inhibit its use as a source of health and medicines information.[10-11] Instrinsic barriers acknowledged in previous research are, e.g., limited consumer eHealth literacy, while extrinsic barriers include, e.g., inconsistency of information that can be found from different websites.[11] Both instrinsic and extrinsic barriers may lead to negative outcomes, such as ending up following advice from non-reliable information or ambiguity of what information to believe. People also differ in their health and medicines information needs and seeking behaviour.[12] The internet may be especially valuable for some patient groups and in situations when, for example, fear of stigmatization and disease-related symptoms limit information seeking from other sources.[9] Factors associated with internet use for health information include younger age, female gender and higher education. [1–3,5,13–14] Internet access and having good skills in using the internet have also an impact on health information searches from the internet.[1] People living in cities, having better incomes, Caucasian, and having a long-

term illness[14] seem also to have an increased frequency of internet use for health-related purposes.[2,5]

Previous studies have focused mainly on health information in the internet. Less is known about the internet use and associated factors for medicines information. Previous studies have focused on describing the internet use for MI in general, comparing the use of internet with other MI sources and assessing the association of internet use by age and sex.[6,15–16] Furthermore, some studies have focused on the use of internet as MI source among people with some specific patient groups, such as mental illness, diabetes, high blood pressure and high cholesterol.[7,9,17–18] More research is needed in order to comprehensively identify those groups who are the most active users of the online MI and who may especially benefit from internet-based MI sources and services in terms of sociodemographic factors (broader than gender and age), health status and medicine use This will help to focus development of internet-based MI sources and services for these groups.

In Finland, increasing rational medicine use with quality medicines information targeted at consumers is one of the main strategic goals identified in the current National Medicines Policy.[19] To achieve this goal, the Ministry of Social Affairs and Health mandated the Finnish Medicines Agency FIMEA to develop a national Medicines Information Strategy[20,21] which sets out six strategic objectives aiming to develop the quality of MI for both health care professionals and the medicine users.

In order to implement the MI strategy, Medicines Information Network was established. One of the five working groups (WG) of this network focuses on developing MI for patients. To base its work on the current knowledge, this WG decided to conduct a survey to discover medicine

users MI needs and sources. Thus, the results described in this article lay the basis for developing MI practices targeted to patients in Finland by this WG.

The aim of this study was to 1) explore the internet as a source of medicines information compared to other sources of MI among frequent internet users, 2) to identify those who use the internet as a source of medicines information, and 3) to describe patterns of use of the internet as a source of medicines information.

Methods

Context

There are several oral, written and electronic MI sources targeted at medicine users in Finland. Physicians and pharmacists are by law required to counsel patients.[22,23] Every medicine package includes a package leaflet, which is mandatory in all European Union Member States.[24] These leaflets are also available via the internet. Additional MI sources for patients are a well-known electronic MI source for patients is a Finnish health portal called "Terveyskirjasto" by The Finnish Medical Society Duodecim. They also publish Current Care Guidelines with patient summaries. Furthermore, there are three nationwide call centres which give information related to medicines: the Drug Information Centre operated by the University Pharmacy; the Teratology Information Service and Poison Information Centre by Helsinki, and Uusimaa Hospital District HUS. Moreover, patient organizations, authorities, pharmacies and the pharmaceutical industry provide written and electronic MI to patients who want to seek additional MI.

Study Design

A self-completed internet-based questionnaire was posted by patient (n=18) and other organizations (n=7) involved in the Medicines Information Network as well as pharmacies (n=87) around Finland on their websites and sent to people on their e-mail lists. Other organizations include, e.g., The Consumer's Union of Finland and Finnish Pharmacists' Association. The number of organizations may be even higher than these numbers as Finnish Medicines Agency FIMEA on its website encouraged all interested parties to forward this survey. The study aimed to reach relatively frequent internet users and explore how they search for medicines information – and to elicit responses from both chronically ill people as well as from healthy people using medicines occasionally. The questionnaire was accessible for

approximately 6 weeks during the period 20th January 2014–28th February 2014. Everyone who had used or was using medicines was invited to answer the survey.

The questionnaire was piloted by 42 medicine users in order to accertain face and content validity. Modifications were made based on the responses received, including, e.g. adding options in some structured questions. During the pilot, the usability and technical functionality of the electronic questionnaire were also tested. Adaptive questioning was used to reduce the number and complexity of the questions.

The questionnaire was mainly structured, including altogether 46 questions, of which three were open questions. The topics included were related to different information sources used; situations when medicines information is needed; needs for additional information about medicines; and experiences of using different information sources. The questions were formulated by the research group based on the information needed for the work of the Medicines Information Network. In this study, the focus is on the questions related to the internet as a source of medicines information.

The participants were asked to read the study description together with the study objectives and other relevant information. Answering the survey was considered as giving informed consent. No personal identifiable information was collected, and the study followed the national ethical guidelines for researchers. In Finland, there is no obligation to seek ethical approval for conducting anonymous questionnaire studies. [25]

Main Outcome Measures

Use of the internet for MI was assessed with the question, “Have you searched for information about medicines from the internet?”. Thus, internet use as MI was not asked for specific medicine in use, rather than seeking MI from the internet on general level. The respondents who indicated that they had used it (n= 2,189) were further asked which internet websites they have searched on for. A list of different options was provided, and the respondent was also given an opportunity to add other options (Figure 2). Options included “the use of a search engine, e.g., Google” and, if this was chosen, the respondent was asked with an open question to give some examples of search terms used. The qualitative data from the open question was thematically categorized and quantified.

In order to compare the internet as a source of MI with other MI sources, a list of 14 different sources (Figure 1) were presented and the respondents were asked to indicate how much they had used each source for information concerning medicines on a 4-point, Likert-type scale (3=much, 2=to some extent, 1=little, 0=not at all).

Background Variables

The following background variables were included: gender, age, area of residence, education, internet use, belonging to a patient organization, long-term illness, number of prescription medicines in use, number of OTC-medicines in use, and the use of vitamins and herbal remedies. These variables were chosen to be able to adjust internet use as a MI source for sociodemographic background, health status and medicine use.

Statistical Analysis

Data were analysed by using SPSS for Windows, Release 21 (SPSS Inc., Chigaco, ILL, USA). Pearson’s Chi-squared test was used to explore the univariate associations between

categorical variables in cross tabulations. The *p*-value of <0.05 was considered to be statistically significant.

In order to determine the adjusted odds ratios (ORs) for the associations of background variables to the use of different information sources, logistic regression analyses were conducted separately for each of the information sources. The results are presented as ORs together with their 95% confidence intervals (CIs). The stepwise method (backward conditional) was used to select the variables in the final models. The final models are shown in the results.

Results

Sample Characteristics

A total of 2,489 medicine users responded to the survey. The representativeness of the respondents compared to the Finnish population is described in Table 1. Most of the respondents were women (85%) and over 50-years (60%), and these groups were overrepresented compared to the population (Table 1). Furthermore, people with junior high school education or less (≤9 years of education) were underrepresented in the study population, and on the other hand, people with senior high school / vocational school education (11–13 years of education) were overrepresented (Table 1).

Of the respondents, 91% indicated that they used the internet daily (Table 2). 90% reported having at least one chronic illness, and 54% reported two or more chronic illnesses. ~~The most common chronic illnesses reported were diseases of the musculoskeletal system (42%), followed by thyroid diseases (27%) and cardiovascular diseases (21%)~~ (Table 2). Most of the

respondents used one or more prescription medicines (94%) and over-the-counter (OTC) medicines (68%). ~~as well as vitamins and herbal remedies at least occasionally (89%).~~

Internet as a Source of Medicines Information

Most of the respondents (88%) reported that they had used the internet when searching for information about medicines, when asked internet as MI on general level. When the respondents were asked to compare the use of altogether 14 different MI sources, the internet (68%) was mentioned as one of the most used MI sources after package leaflets (90%) and health care professionals, especially pharmacists (83%) and physicians (72%) (Figure 1).

~~According to the univariate analysis, the internet was used as a MI source most often by women (89%), by respondents with a polytechnic, college or university degree (92%) and persons under 65 years of age (91%) (Table 2). Furthermore, respondents who used the internet daily (90%) used it also more often when searching for information about medicines compared to respondents who used the internet weekly or less frequently (68%). Of the chronically ill patients, patients with thyroid disease (93%) often used the internet as an MI source. Also, the users of vitamins and herbal remedies (90%) used the internet as an MI source.~~

According to the univariate analysis, the following variables were associated with the internet use as an MI source: women gender,age less than 65 years, polytechnic, college or university degree, daily use of internet, thyroid disease, and the use of vitamins and herbal remedies (Table 2).

The results of the logistic regression analysis are shown in Table 3. According to the Nagelkerke R Square, the logistic regression model for internet use as an MI source accounted for 7,7% of the variation. ~~The following variables remained significantly associated with the internet use as an MI source after being adjusted with other variables: women gender, age less than 65 years, polytechnic, college or university degree, daily use of the internet, and continuous use of vitamins and herbal remedies.~~

According to the multivariate analysis, the internet was used as a MI source most often by women, by respondents with a polytechnic, college or university degree and persons under 65 years of age, when adusted with other variables (Table 3). Furthermore, respondents who used the internet daily used it also more often when searching for information about medicines compared to respondents who used the internet weekly or less frequently. Moreover, the users of vitamins and herbal remedies used the internet as an MI source when adjusted with other variables (Table 3).

Patterns of Internet Use as a Source of Medicines Information

Respondents indicated most commonly searching for medicines information from a Finnish health portal called “Terveyskirjasto” (56%) by The Finnish Medical Society Duodecim (Figure 2). Search with a search engine, e.g., Google (43%) was also common. Other websites commonly used were the websites of pharmacies (41%) and the medicines authorities (38%) as well as commercial health portals (37%).

When searching for MI with a search engine, the respondents mentioned in their open responses (n=1065) most commonly using the name of the medicinal product (n=444, 42% of the open responses), but also the name of a symptom or disease (n=214, 20%) or an active

ingredient (n=104, 10%) was used. Furthermore, information was searched for with the name of the manufacturer and other words such as “price” or “self-care” (n=115, 11%). Respondents searched for MI on average from three different websites.

Chronically ill patients indicated searching for medicines information more often from patient organizations’ websites (33%, $p < 0.001$) and from the National Archive of Health Information (Kanta-portal) including personal medical records and electronic prescriptions (www.kanta.fi, 14% $p=0.029$) than other respondents. However, they used the websites of pharmacies less often than other respondents (40%, $p=0.043$).

Of the chronically ill, people with mental diseases used websites of pharmacies more often than other patient groups (50%, $p < 0.001$). Patients with thyroid diseases searched for information from commercial health portals (42%, $p < 0.001$), and together with patients with diseases of the musculoskeletal system also from patient organizations’ websites more often compared to other patient groups (41% and 36%, respectively, $p < 0.001$).

Discussion forums were commonly used MI sources for mentally ill patients and patients with thyroid disease (32% and 26%, respectively, $p < 0.001$). On the other hand, patients with cardiovascular diseases reported using them less compared to other patient groups (15%, $p < 0.001$). The Kanta -portal was most commonly used by patients with diabetes (28%), mental diseases (21%), pulmonary diseases (21%) and cardiovascular diseases (21%)($p <0.001$). Finally, patients with skin diseases used the websites of medical clinics when searching for MI more often compared to other patient groups (19%, $p < 0.001$).

Discussion

According to the results of the present study, frequent internet users commonly use package leaflets, health care professionals and internet as their source of MI. The results are in accordance with previous studies focusing on health information, showing that the internet is used in particular by highly educated, relatively young women who use it daily[1–2,3,5] and those who continuously use vitamins and herbal remedies, even though some previous studies have not found differences between genders in internet use for health information purposes.[13] Chronic illnesses were not associated with increased internet use as a medicines information source in our study, which contrasts with previous studies[7,9,17–18] and thus, needs to be explored further. This discrepancy may be due to methodological issues, as this survey was posted mainly by patient organizations yielding to a group of respondents who almost all had some chronic illness.

As shown in some previous studies, search engines were commonly used when finding information from the internet.[1,5,9,11] It has been previously shown that, even though people may be critical of the information they find from the internet, they rarely systematically apply any quality assessment criteria for evaluating the reliability of the information found.[26] Thus, easy-to-use tools which may be of help in evaluating the reliability of the MI, such as DARTS,[26] should be promoted. Acronym DARTS comes from words Date, Author, References, Type and Sponsor. Reviewing MI against these criteria helps to assess the reliability of the information. It should be acknowledged that wide proportion of the respondents in this study reported using reliable MI sources that can be found from the internet, e.g., Finnish health portal "Terveyskirjasto".

In this study, chronic illnesses were not associated with the internet use as an MI source in the multivariate analysis, however, different patterns of internet use were identified among

people suffering from different illnesses. For example, mentally ill respondents used the websites of pharmacies and attended to discussion forums more often compared to other respondents. However, based on the results of this study it can not be concluded whether discussion forums were used for MI or social support or both. People may turn to the internet with other types of MI needs than to other information sources. In fact, previous studies have shown that people search the internet, for example, for a second opinion and to supplement other information.[9,27] Furthermore, people look for peer-support from the internet, and this is the case especially among people with mental health problems.[9,28] These kinds of differences should be taken into account when tailoring online MI to different patient groups. Furthermore, package leaflets were shown to be a widely used MI source in this study. Based on previous studies, pagkage leaflets are not necessary unproblematic MI source and may, in fact, cause more questions than give answers to patients .[29–31] Internet may then be reached to find answers for th questions that reading package inserts raised. However, the order of MI sources used by the respondents in this study can not be determined and this phenomenon warrants further research.

The fact that patients using remedies and herbal medicines are using the internet more than other patients is not surprising, and may reflect their higher education and likely consciousness about their health, as previously reported.[32–33] These groups may be more interested in searching information and also better skilled to do that. Internet as a source of MI was high also in older age groups (50–64 years) and comparable to younger age groups (<30 and 30–49 years), and only in the oldest age group the use of internet as source of MI was substantially lower. It can be foreseen, that the use of internet as source of MI will increase also in older age groups over time. Internet is, thus, becoming increasingly important source of MI in the future.

Some strengths and limitations of the study must be considered when interpreting the results. Most of the respondents indicated using medicines, so the responses are closely based on individual experiences. Furthermore, people with many different chronic diseases answered the survey, and thus, it captured various experiences from the perspectives of different chronic diseases. The survey was only available via the internet, and as aimed, it reached well people who use the internet. However, this has to be taken into account when interpreting the results, as the percentage of internet use as an MI source may be higher than it is among the whole population, even though, the internet penetration rate is high in Finland (92.2%).[34]

Despite the large number of respondents, the results are based on a convenience sample of people, and thus, generalizations have to be considered carefully. Because the questionnaire was only available through the internet, it is not possible to calculate the conventional response rate. However, based on previous epidemiological studies which have used Web-based recruitment methods, we can expect a reasonable level of validity.[35–36] The study population represented the Finnish population in terms of areal distribution, although there were variations in terms of gender, age, and education level (Table 1). As is typical for all surveys, females are more eager to answer,[37] which was seen also in this study. As always in questionnaire studies,[37] the respondents may have different interpretations of questions, such as options considering the frequency of use of different information sources (much, to some extent, little, not at all) and the question about whether the participants have used the internet to search information about medicines as it did not include any timeframe and lacked a clear definition of what is meant by “the internet”. These may have hindered the validity of the questions.

Conclusions

The internet is among the most commonly used MI sources after package leaflets and health care professionals. In our study, chronic illnesses were not associated with increased internet use as a medicines information source. However, chronically ill people's patterns for searching information differed from other respondents, e.g., they searched information more often from patient organizations' websites but less from websites of pharmacies than respondents without any chronic illness. There were also differences in websites where chronically ill people searched information, such as that discussion forums were more commonly used by mentally ill patients and patients with thyroid disease compared to patients with other chronic illnesses. Such differences should be taken into account when developing MI to these different patient groups.

The groups of people identified in this study using the internet as a source of MI include well educated, young women , who use internet daily and who also continuously use vitamins and herbal remedies. Health care professionals should especially ask these patient groups whether they have searched MI from internet. Rather than discouraging the use of the internet as a MI source, health care professionals should direct patients to accurate and reliable source of online MI and to tools to help evaluate its reliability.

References

1. Ybarra ML, Suman M. Help seeking behavior and the Internet: A national survey. *Int J Med Inform.* 2006;75: 29–41.

2. Dumitru RC, Bürkle T, Potapov S, Lausen B, Wiese B, Prokosch H-U. (2007). Use and perception of Internet for health related purposes in Germany: results of a national survey. *Int J Pub Health.* 2007;52: 275–285.

3. Kummervold PE, Chronaki CE, Lausen B, Prokosch H-U, Rasmussen J, Santana S, Staniszewski A, Wangberg SC. eHealth Trends in Europe 2005–2007: A population-based survey. *J Med Internet Res.* 2008:10, e42. doi: 10.2196/jmir.1023

4. Wangberg S, Andreassen H, Kummervold P, Wynn R, Sørensen T. Use of the internet for health purposes: trends in Norway 2000–2010. *Scand J Caring Sci.* 2009:23, 691–696.

5. Fox S, Duggan M. Health Online 2013. *Pew Internet & American Life Project*. Retrieved from http://pewinternet.org/Reports/2013/Health-online.aspx

6. Närhi U, Helakorpi S. Sources of medicine information in Finland. *Health Policy.* 2007:84, 51–57.

7. Pohjanoksa-Mäntylä M, Bell JS, Helakorpi S, Närhi U, Pelkonen A, Airaksinen MS. Is the Internet replacing health professionals? A population survey on sources of medicines information among people with mental disorder. *Soc Psychiatry Psychiatr Epidemiol.* 2011:46, 373–379. doi: 10.1007/s00127-010-0201-7

8. Hämeen-Anttila K, Jyrkkä J, Enlund H, Nordeng H, Lupattelli A, Kokki E. Medicines information needs during pregnancy – A multinational comparison, *BMJ Open.* 2013:3, e002594. doi:10.1136/bmjopen-2013-002594

9. Pohjanoksa-Mäntylä M, Saari JK, Närhi U, Karjalainen A, Pylkkänen K, Airaksinen MS, Bell JS. How and why do people with depression access and utilize online drug information: A qualitative study. *J Affect Disord* 2009:114, 333–339.

10. Eysenbach G. Design and Evaluation of Consumer Health Information Web Sites. Consum Healt Informatics 2005;34:60.

11. Lee K, Hoti K, Hughes JD, Emmerton L. Dr Google and the Consumer: A qualitative study exploring the navigational needs and online health information-seeking behaviors of consumers with chronic health conditions. *J Med Internet Res.* 2014:16, e262. doi: 10.2196/jmir.3706.

12. Pang PCI, Chang S, Verspoor K, Pearce J. Designing Health Websites Based on Users' Web-Based Information-Seeking Behaviors: A Mixed-Method Observational Study. *J Med Internet Res*. 2016;18(6):e145 doi:10.2196/jmir.5661

13. Koch-Weser S, Ylisabyth S, Bradshaw LG, Gallagher SS. The Internet as a health information source: Findings from the 2007 Health Information National Trends Survey and implications for health communication. *J Health Commun.* 2010:15, 279–293.

14. Siliquini R, Ceruti M, Lovato E, Bert F, Bruno S, De Vito E, Liquori G, Manzoli L, Messina G, Minniti D, La Torre G. Surfing the internet for health information: an Italian survey on use and population choices. *BMC Med Inform Decis Mak.* 2011:11, 21. doi: 10.1186/1472-6947-11-21

15. Närhi U. Sources of medicine information and their reliability evaluated by medicine users. *Pharm World Sci.* 2007:688–694.

16. Ho CH, Ko Y, Tan ML. Patient needs and sources of drug information in Singapore: is the internet replacing former sources? *Ann Pharmacother.* 2009:43, 732–739.

17. Sleath B, Wurst K, Lowery T. Drug information sources and antidepressant adherence. *Community Ment Health J.* 2003:39, 359–368.

18. Abanmy NO, Al-Quait NA, Alami AH, Al-Juhani MH, Al-Aqeel S. The utilization of Arabic online drug information among adults in Saudi Arabia. *Saudi Pharm J.* 2012:20, 317–321.

19. Ministry of Social Affairs and Health. Towards efficient, safe, rational and cost-effective use of medicines. Helsinki: *Publications of the Ministry of Social Affairs and Health*. 2011:2.

20. Finnish Medicines Agency FIMEA. Rational use of medicines through information and guidance. Medicines Information Services: Current State and the Strategy for 2020, Fimea develops, assesses and informs, serial publication 1/2012, Finnish Medicines Agency 2012. Accessed 28 June 2017: http://www.fimea.fi/documents/542809/838272/21513_KAI_JULKAISUSARJA_Laakeinformaatiostrategia_1_2012_eng_links.pdf/cff7266f-87f8-4c5e-a6be-70d18d701bea

21. Hämeen-Anttila K, Luhtanen S, Airaksinen M, Pohjanoksa-Mäntylä M. Developing a national medicines information strategy in Finland – A stakeholders` perspective on the strengths, challenges and opportunities in medicines information. *Health Policy.* 2013:111, 200-205.

22. Medicines Act 10 Apr 1987/395. Accessed 28 June 2017: www.finlex.fi

23. Ministry of Social Affairs and Health. Decree on pharmaceutical prescriptions *1088/2011b*. Accessed 28 June 2017: www.finlex.fi

24. European Union. Council Directive 92/27/EEC, Labelling and package leaflets for medicinal products. 1992

25. National Advisory Board on Research Ethics. Ethical principles of research in the humanities and social and behavioural sciences and proposals for ethical review. 2009. Accessed 28 June 2017: http://www.tenk.fi/sites/tenk.fi/files/ethicalprinciples.pdf

26. Närhi U, Pohjanoksa-Mäntylä M, Karjalainen A, Saari KJ, Wahlroos H, Airaksinen MS, Bell SJ. The DARTS tool for assessing online medicines information. *Pharm World Sci.* 2008:30, 898–906.

27. Powell J, Ingli N, Ronnie J, Large S. The characteristics and motivations of online health information seekers: cross-sectional survey and qualitative interview study. *J Med Internet Res.* 2011:13, e20. doi: 10.2196/jmir.1600

28. Powell J, Clarke A. Information in mental health: qualitative study of mental health service users. *Health Expect.* 2006:9, 359–365.

29. Raynor DK, Svartstad B, Knapp P, Aslani P, Rogers MB, Koo M, Krass I, Silcock J. Consumer medication information in the United States, Europe, and Australia: a comparative evaluation. J Am Pharm Assoc 2007: 47(6): 717-24

30. Tong V, Raynor DK, Blalock SJ, Aslani P. Consumer interpretation of ramipril and clopidogrel medication risk information – implications for risk communication strategies. Patient Prefer Adherence 2015; 9(9): 983-8

31. Dickinson R, Raynor DK, Knapp P, MacDonald J. How much information about the benefits of medicines is included in patient leaflets in the European Union? – A survey. Int J Pharm Pract 2017; 25(2):147-158

32. Gratus C, Damery S, Wilson S, Warmington S, Routledge P, Grieve R, Steven N, Jones J, Greenfield S. The use of herbal medicines by people with cancer in the UK: a systematic review of the literature. *Q J Med.* 2009:102, 831–842.

33. Hämeen-Anttila KP, Niskala UR, Siponen SM, Ahonen RS. The use of complementary and alternative medicine among Finnish parents – a population survey. *BMC Complement Altern Med.* 2011:11, 107.

34. Internet World Stats. *Internet in Europe Stats*. 2017. Accessed 28 June 2017: http://www.internetworldstats.com/stats4.htm#europe

35. Ekman A, Dickman PW, Klingt A, Weiderpass E, Litton JE. Feasibility of using we-based questionnaires in large population-based epidemiological studies. *Eur J Epidemiol.* 2006:21, 103–111.

36. van Gelder MMHJ, Bretveld RW, Roeleveld N. Web-based questionnaires: the future in epidemiology? *Am J Epidemiol.* 2010:172, 1292–1298.

37. Tolonen H. Towards the high quality of population health surveys. Standardization and quality control. Publications of the National Public Health Institutae 27/2005. Academic dissertation. National Public Health Institute, Helsinki and Faculty of Medicine, University of Kuopio, Finlans. Accessed 25 September 2017: http://epublications.uef.fi/pub/urn_isbn_951-740-547-2/urn_isbn_951-740-547-2.pdf