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The impact of internet based information sources on patient satisfaction of care in Region Skåne – A cross sectional study using survey data

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Abstract

Background: Health care reforms introducing patient choice have been gaining popularity during the last decades and several countries have implemented patient choice. The underlying principle of patient choice is anchored in the concept of the well-informed patient, an individual that knows what he or she is choosing between. Several information sources, related to choice of caregiver and treatments have been made available for the population but the reality is that very few use them. The aim of this study is to investigate the use of internet based information services (IBIS) to compare caregivers and its impact on satisfaction with care, in the wake of the implementation of *Hälsoval Skåne* in the Swedish council of Region Skåne in 2009.

Methods: Using data from 2010 and 2013 population survey "Vårdbarometern", this study used a logistic regression model to investigate the impact of IBIS-use on satisfaction with primary care givers. To visualise the utilisation of IBIS and characteristics of an IBIS-user, descriptive statistics and Pearson's Chi-square test were used.

Results: The findings from this study show that the use of IBIS in Region Skåne was low in both 2010 and 2013 and that an IBIS user was less likely to feel high satisfaction with their primary care. The typical IBIS user was more often young, well educated, female and considered themselves healthy.

Conclusion: This study contributed to the pool of existing evidence about the impact that information use has on satisfaction with care. The study confirms previous findings of low utilization of IBIS and emphasis that further research is needed for IBIS to fulfil its full potential.

Table of contents

1. Introduction

A desire to increase the responsibility and involvement of patients in their own care can be seen through the implementation of patient centred health care reforms (Vårdanalys, 2012, Propper, 2010). The Swedish health care system started to make the move towards a more patient centred structure in 2007, implementing a health reform introducing patient choice of primary care provider nationally in 2010 (SFS, 1982). This introduced the patient's right to choose primary care provider based on their own preferences and opened up the market for private health care providers (SFS, 1982, Glenngård et al., 2011). Proposed benefits of patient choice have been examined from many angles and evidence show that introducing patient choice can lead to improvements in both health care quality and patient satisfaction (Burgess et al., 2005, Chu-Weininger and Balkrishnan, 2006, Hsu et al., 2003). In Sweden, the patient choice reform has been shown to have lead to an increase in patient satisfaction and utilisation of primary health care services (Vårdanalys, 2014a).

With the new patient centred health reforms, research have started to emphasise the need for more and better information supporting the process of making a choice (Bornstein et al., 2000, Burgess et al., 2005, Fanjiang et al., 2007). While there are many channels through which an individual can access health care information, the internet is one that is on the rise (Dealey, 2005, Rahmqvist and Bara, 2007, Schneider and Lieberman, 2001). In some instances the internet seems set up to become the only or most important information source, with countries creating websites for not only information but also services like choosing ones care provider (Berendsen et al., 2010, Laverty et al., 2013). While the internet creates a platform that can provide information in a fairly easily accessible and convenient manner for many, there is also a risk of excluding people through an increased reliability on the internet (Fanjiang et al., 2007, Vårdanalys, 2012). The impact of the internet as a health information source on patients' satisfaction with care, is a research field where knowledge gaps are waiting to be filled (Bornstein et al., 2000, Fotaki et al., 2008). This study contributes to the investigation of this issue, providing information on the actual use and impact of internet based information sources on satisfaction of care.

1.1. Aim and Objectives of Study

The overall aim of this study is to investigate who uses internet based information sources (IBIS) to compare caregivers and investigate the possible impact this use has on patient satisfaction measures in Region Skåne 2010 – 2013. To do this three specific objectives have been identified:

1. Determine the prevalence of IBIS use in a sample of individuals.
2. Analyze the characteristics of the individuals stating that they have used IBIS to compare care.
3. Explore the association between IBIS use and the key outcome variables of perceived confidence in their primary care provider and access to care.

1.2. Outline of thesis

The paper will start off by describing the current evidence on the subject of patient choice and information use and then move on to describe the methodology that is used in this study. This is followed by a presentation of the study's findings and a discussion of these.

2. Review of the literature and Analytical framework

2.1. Patient choice reforms

The Swedish health care system is decentralised and the responsibility for health care lies with the 21 County councils (SFS, 1982, Glenngård et al., 2011). The primary health care system is supposed to be the natural first contact with the health care system and it is described in the national health care law as an entity of the health care system that takes on all types of health problems (SFS, 1982). A strong primary health care system, working preventatively while offering choice and continuity for the patient has the potential to decrease misuse of the health care system, making the whole health care system more efficient (Saltman and Bergman, 2005, SKL, 2010). The patient choice reform, implemented nationally in 2010, determined that all counties had to offer their patients free choice of primary health care provider and opened up the market to private care providers (SKL, 2010, SOU, 2008).

Patient choice based systems can be seen in various forms in other countries (Berendsen et al., 2010, Fotaki et al., 2008, Propper, 2010, Vårdanalys, 2012). Countries with similar health care systems to the Swedish one, like the United Kingdom and other Scandinavian countries, are reasonably new to the change in the role of the patient in comparison to countries with

health care systems based on insurance, like the United States, where patient choice have a longer history. The rationale for implementing patient choice is empowering the patient and providing incentives for providers to increase quality of services provided (Vårdanalys, 2012).

The southern region of Skåne was one of the earliest reformers in Sweden as it began implementing the patient choice reform program –*Hälsoval Skåne* -- in 2009 (Region Skåne, 2008). *Hälsoval Skåne* was implemented as an answer to warnings that the Skåne system was failing in using the resources available in an efficient way, not providing quality care to the population. The goals of the reform were to empower patients through the provision of choice and a more diverse health care market making care more easily accessible. Economic incentives to ensure continuity of care were established for both providers and patients. The providers got paid per patient enlisted at the clinic and patients faced higher patient fees if they received care at a provider other than the one they were listed to (Vårdanalys, 2012, Region Skåne, 2008).

2.2. The informed choice and its consequences

Making a choice have been linked to an increased satisfaction with care among patients (Chu-Weininger and Balkrishnan, 2006, Hsu et al., 2003, Vårdanalys, 2012). Over the period of 2010-2013, Vårdbarometern, a Swedish population survey of the public's attitudes towards care show that the confidence in care and perceived access to care is high, around 65 percent and 80 percent respectively (Sveriges Kommuner och Landsting, 2014, Sveriges Kommuner och Landsting, 2011). Despite these high numbers, it is found that after implementation, the Swedes actually making a choice appears to be quite a small group (Glenngård et al., 2011, Rosén et al., 2001). This seems contradictory to the evidence suggesting that many see the ability of choosing ones care provider as something important and generally beneficial (Coulter and Jenkinson, 2005, Nordgren and Åhgren, 2010).

Not only the Swedes value the ability to choose their care provider and see the importance of information in this choice. International evidence show that few are making a choice and using choice related information services available (Harris, 2003, Propper et al., 2005). The reported utilisation of information varies throughout the limited literature that can be found on the topic (Vårdanalys, 2014b). Countries like Sweden, the Netherlands and the United

Kingdom have created web pages where the public is able to read up on providers and health information (Berendsen et al., 2010, Laverty et al., 2013). The UK website, NHS Choices was only used by 4% of the public (Dixon et al., 2010). The low usage of sources like NHS Choices could be explained by the type of information that often is present on these types of web pages. The performance data used to show quality of different providers, is often not the type of data the public wants and they often feel it is hard to interpret and use (Schneider and Lieberman, 2001, Vårdanalys, 2012). The individuals that have used and searched for information, report using sources like family and friends and their current doctor most often while the use of sources on the internet are continuously low even though it is reported to be on the rise (Dealey, 2005, Dixon et al., 2010, Rahmqvist and Bara, 2007, Schneider and Lieberman, 2001).

While being linked to better satisfaction with care and an increase in the quality of care, patient choice has also raised concerns, mainly based in the idea of inequality (Ringard, 2012, Vårdanalys, 2012). Concerns about inequality can be related to differences in access to and use of information sources, like the internet, to make a choice about care provider. To know the difference between two providers, the consumer would have to have access to and be able to interpret information about both providers' services (Vårdanalys, 2012). This act of searching for information and interpreting it can be costly in terms of time and energy. Some suggests that there has to be a certain sense of urgency in the situation for an individual to actually make the effort of finding and interpreting the information. This urgency is often not present until the individual is in need of care (Fanjiang et al., 2007, Schneider and Lieberman, 2001).

An important aspect of IBIS use is the characteristics of patients and their ability to use the internet as a source of information. It has been suggested that in a choice based system, the highly educated and more affluent groups of society have better conditions to access high quality care and find information on the best choice for them. For less fortunate people in lower socioeconomic groups there are barriers to making a choice and then also, by extension, a barrier to reach higher satisfaction with care (Fotaki et al., 2008).

Age has been shown to affect the making of an informed choice. The younger part of the population is often seen as a part of the more able group, more often being educated, having a

better health status and better internet skills than older groups of society (Nordgren and Åhgren, 2010, Vårdanalys, 2012). However, the elderly have been shown to be more interested in the ability to choose than young people have (Berkelmans et al., 2010, Vårdanalys, 2014b).

The effect of gender on utilisation of care and satisfaction measures, affects the utilisation of health care and also it has been shown the perceived satisfaction of care and information seeking behaviour. Women utilize care more often than men and are more prone to make a choice and also value the ability to make a choice, than men (Vårdanalys, 2014b).

Health status is mentioned to have an impact on the ability and will to make a choice and search for information. People with lower general health are less likely to search for information or investigate the choices present due to the energy that task takes is to high. Thus the ones that needs care the most would be the ones not being able to choose the best care possible for them, ultimately impacting their satisfaction of care, creating inequality over the spectrum of health (Berkelmans et al., 2010, Nordgren and Åhgren, 2010).

Not much research has been done linking the use of information sources to satisfaction of care, even less on the specific use of IBIS, creating a knowledge gap that needs to be filled. Increasing the knowledge about what the public wants in an IBIS and what is currently stopping them from using it is important for the development of future internet based resources for health care services.

2.3. Ethical considerations

The author considered ethical issues like confidentiality, but since identification of respondents was not possible through the data set and the topics used in this study were not of a sensitive nature the issue was not considered urgent.

2.4. Analytical framework

Based on the above findings from previous studies of patient choice and information and individuals' health care seeking behaviour, this section presents a simple analytical framework that will guide the empirical analysis of the study.

Figure 1: Analytical framework
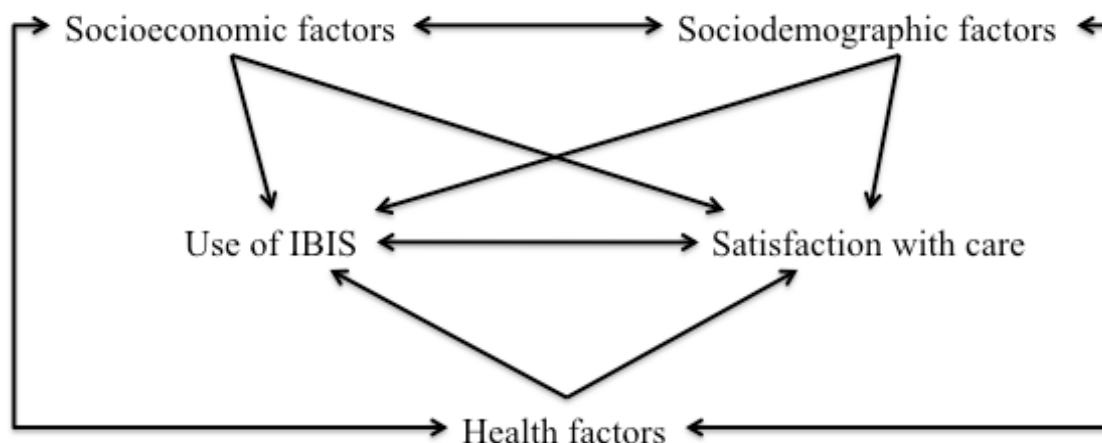
Three explanatory groups represent the different possible influences on satisfaction of care and IBIS use identified in the literature. Figure 1 depicts these groups and the theorised influences they have on the use of IBIS and satisfaction with care as well as on each other. The main influence on satisfaction with care, investigated in this study is that of IBIS. IBIS is thought to have a positive impact on satisfaction since IBIS could lead to a better informed choice. Satisfaction of care is in turn thought to influence the use of IBIS. Low satisfaction could lead an individual to seek information about what care they should receive and to find a better care provider.

Having poor health is thought to be a hinder to information seeking behaviour, and should thus have a negative impact on the use of IBIS, indirectly lowering the satisfaction with care. Poor health could also impact satisfaction with care directly. Having poor health status would mean more frequent contact with health care and a higher perception of what care is needed. This could create a more aware user of the services that might be more prone to see faults not noticeable to the less frequent and less demanding user, thus stating lower satisfaction with care.

Sociodemographic factors, like age and gender, could have both positive and negative impacts on satisfaction. Elderly people seem more prone to feel satisfied with their care than young people. Young people however seem more prone to utilise IBIS than the elderly. Something that as proposed above would lead to higher satisfaction with care. Being female is thought to

have a negative impact on satisfaction with care due to different health needs and utilisation of health care compared to males.

Socioeconomic factors, especially education is thought to have a big impact on both satisfaction with care and the use of IBIS. Being better educated could lead to being more aware of flaws in the provision of care, impacting satisfaction with care negatively. The access to IBIS is also determined by socioeconomic factors and is thought to follow a social gradient. Being in the lower socioeconomic groups would impact IBIS use negatively, indirectly lowering satisfaction with care. It could also improve satisfaction with care since someone less educated might not be as aware of the care needed and the flaws in the provision of care.

Based on this analytical framework, the study identifies the following regression model:

$$Y = \alpha + \beta_{IBIS} \times IBIS + \beta_{SocDem} \times SocDem + \beta_{SocEc} \times SocEc + \beta_{Health} \times Health + \varepsilon \ (1)$$

This regression model illustrates how satisfaction of care is dependent on IBIS use and the three explanatory groups identified in the analytical framework, sociodemographic factors, socioeconomic factors and health factors. In the equation Y represents the dependent variable, satisfaction with care, α represents the level of satisfaction and access to care if all other variables are zero and β represents the coefficients for the respective independent variables.

3. Data and Methods

This section describes the data set used in this study, from where it was obtained and what variables are used. It also describes the statistical methods used to analyse the data.

3.1. Data base

This study utilised datasets obtained from the national population survey "Vårdbarometern" (VB) from the years 2010 and 2013. Indikator AB conducted the data collection on assignment from the Swedish association of local authorities and regions (SKL). Access to the data was obtained through the regional Vårdbarometern supervisor for Region Skåne and the detailed description of the questionnaires and the script for investigators was provided by Indikator AB.

VB has a cross sectional study design and is used to record the Swedish population's

attitudes, expectations and knowledge about the health care system. It is conducted yearly in almost all councils and was started in 2001 (Sveriges Kommuner och Landsting, 2011, Sveriges Kommuner och Landsting, 2014). The survey includes five themes common for all councils:

1. Contact with health care
2. Attitudes towards different treatment options
3. Access to health care
4. Confidence in health care
5. Financing and priorities of the health care

In addition to the five common themes, council specific questions can be added. The survey also includes background questions, mapping respondents' age, education level and health status (Sveriges Kommuner och Landsting, 2011, Sveriges Kommuner och Landsting, 2014).

The study population is randomly selected individuals 18 years and older. Data is collected through phone interviews where the interviewer reads the questionnaire to the respondent and registers the responses.

In 2010 VB changed to make it a survey purely focused on attitudes and behaviours surrounding health and health care, excluding previous patient experience questions. With this change, the structure of the survey and the questions were changed and the 2010 survey is to be seen as a pilot study. The surveys conducted the following years were subject to some changes and it is stated in the official VB reports that comparisons between the 2010 survey and following surveys should be done with caution (Sveriges Kommuner och Landsting, 2011). The 2010 survey was conducted with a smaller group of respondents, 1000 compared to 6000 in 2013 (Sveriges Kommuner och Landsting, 2011, Sveriges Kommuner och Landsting, 2014). This was taken into consideration when choosing questions to use for this study and the data collected is only based on questions that have maintained the same meaning between 2010 and 2013.

This study used data collected for Region Skåne only and the variables used were derived from the themes "Access to health care", "Confidence in health care" and background questions.

3.2. Variables

The following section describes the variables used in this study and how they were created as well as describes the analysis methods used and the rationale behind the use of them. In order to visualise the data and detect current trends, frequency tables and cross tabulations were created. Spearman's correlation coefficient (results not shown) was also used to investigate the correlation between the independent variables. The cut off level for correlation was set to 0,3 and if the correlation coefficient was above 0,3 both variables could not be put into the same regression model. No variables had a correlation coefficient higher than 0,3. Table 1 shows descriptive statistics for the variables used in the study.

Table 1: Descriptive statistics Vårdbarometern Skåne, 2010 & 2013.

Variables		Freq		m.d	
		2010 n (%)	2013 n (%)	2010 n(%)	2013 n(%)
Confidence in PCP	*High*	607 (63,3%)	3640 (63,2%)	41 (4,1%)	244 (4,1%)
	Not high	352 (36,7)	2116 (36,8%)		
Access to care	*Agree*	803 (80,9%)	4511 (77%)	8 (0,8%)	143 (2,4%)
	Do not agree	189 (19,1)	1346 (23%)		
Use of IBIS	*Have used*	57 (5,8%)	326 (6,4%)	16 (1,6%)	945 (15,8%)
	Have not used	927 (94,2%)	4729 (93,6%)		
Self assessed health knowledge (SAHK)	*Good*	876 (88,6%)	5038 (87,9%)	11 (1,1%)	270 (4,5%)
	Not good	113 (11,4%)	692 (12,1%)		
Self assessed health (SAH)	*Good*	753 (76,1%)	4368 (76%)	10 (1%)	252 (4,2%)
	Not good	237 (23,9%)	1380 (24%)		
Long term health problem (LThp)	*Yes*	360 (36,6%)	2176 (38%)	17 (1,7%)	280 (4,7%)
	No	623 (63,4%)	3544 (59,1%)		
Age	*Young (18-39)*	213 (21,3%)	1246 (20,8%)	0 (0%)	0 (0%)
	Middle age (40-59)	334 (33,4%)	1660 (27,7%)		
	Old (60+)	453 (45,3%)	3094 (51,6%)		
Gender	*Male*	558 (55,8%)	2931 (48,9%)	0 (0%)	0 (0%)
	Female	442 (44,2%)	3069 (51,2%)		
Education	*9 years*	166 (16,9%)	1325 (23%)	19 (1,9%)	244 (4,1%)
	12 years	437 (44,5%)	2360 (41%)		
	<12 years	378 (38,5%)	2017 (36%)		
Visit to care	*Yes*	642 (64,3%)	3849 (64,4%)	2 (0,2%)	22 (0,4%)
	No	356 (35,7%)	2129 (35,6%)		

Source: Vårdbarometern 2010 and Vårdbarometern 2013 datasets

3.2.1. Dependent variables

Two dependent variables have been chosen to represent satisfaction with care: "Confidence in primary care provider" and "Access to health care".

The "Confidence in primary care provider"-variable is derived from the question " How big or small would you say your confidence in primary health care providers are?" where the respondents are asked to rank their confidence on a 5-point scale from "Very low" to "Very high". For the purpose of this study, the variable has been made binary with High and Not High as the alternatives. High includes the scale points "High" and "Very High" whilst "Not High" includes the scale points "Neither high nor low", "Low" and "Very Low".

Data on access to health care is derived from a question where respondents answer if they agree with the following statement " I have access to the care I need". This question had a 5-point scale for the respondent to answer ranging from "I highly disagree" to "I highly agree". The data was dichotomised into the answers "Agree" encompassing alternatives "I highly agree and I agree" and "Do not agree", being made up of the alternatives "I neither disagree nor agree", "I disagree" and "I highly disagree"

Access to care in this case was not specific for primary care but included the whole spectrum of health care providers. Since the primary care is supposed to be the first contact with health care for an individual in Sweden, it is assumed that the perceived access includes primary health care (SKL, 2010).

3.2.2. Independent variables

The independent variables in equation (1) above were all chosen with the help of the analytical framework created from the body of evidence relating to patient choice reforms and the health information. They were all assumed to have an impact on the key outcome variables. For response frequency and missing data, see Table 2.

The use of internet based information services (IBIS) is the key independent variable used in this study. The variable is derived from the question "Have you used the internet to compare caregivers during the last 6 months?". The original question had three possible answers "Yes" "No" and " I don't use the internet". These have been combined to form two alternatives "Have used IBIS" and "Have not used IBIS". It was assumed that an individual stating that they do not use the internet did not make use of IBIS.

Data on health factors were collected through three questions; "How do you assess your own health status?" "Do you have any long term health problems?" "How good or bad would you say your health knowledge is?". Self-assessed health and self-assessed health knowledge

featured 5-point answers ranging from "Very good" to "Not good". Both were coded into a dichotomous variable with the alternatives "Good" and "Not good". The question about long-term health problems originally had three alternatives "Yes, "No" and "I do not want to answer". For the analysis "I do not want to answer" was coded as missing since it could not be determined if an individual choosing not to answer did or did not have any health problems and thus they could not be put into any of the two remaining categories "Yes" and "No".

The respondent's sociodemographic characteristics are represented by age and gender. Data to create the variables "Age" and "Gender" were taken from the section of background questions. The age variable was modified from its original format of 8 groups into three groups: Young (18-39), Middle age (40-59) and Old (60+). This was done because of the small amount of respondents in the original group 18-19 years old. The variable for gender was taken straight from the survey and the alternatives "Male" and "Female" were not altered in any way.

Level of education was used to control for the socioeconomic situation of a respondent. Data to create this variable was taken from the question "What is your highest completed education?". The variable was modified from previous four groups "Primary school", "Secondary school", "University" and "Other" and coded into three groups: "9 years", "12 years" and "More than 12 years" to make the results more understandable for readers not familiar with the Swedish school system.

3.3. Methods
3.3.1. Bivariate analysis

Bivariate analysis was carried out through the use of Pearson's Chi-square test (denoted χ^2-test) to establish if there were differences in proportions of the explanatory variables in relation to the key independent variable, IBIS use.

The null hypothesis (h_0) for the Chi-square test was that there was no significant difference between proportions while the test hypothesis (h_1) was that there was a significant difference between the proportions. Pearson's χ^2-test was performed in SPSS and the p-value for each independent variable was noted. Statistical significance was set to p-value<0,05, with significance levels denoted as **= p-value<0,05 and ***=p-value<0,01.

3.3.2. Multivariate analysis

The logistic regression model was based on equation (1) seen in section 2.3. The regression analysis was done to investigate if any significant differences in feelings of adequate access and high confidence in PCP could be seen between users of IBIS and non users of IBIS, controlling for different socioeconomic, sociodemographic and health related characteristics. Full model can be seen in Equations (2) and (3).

$$\text{Acc (high)} = \alpha + \beta_{\text{IBIS}} \times \text{IBIS} + \beta_{\text{Age}} \times \text{Age} + \beta_{\text{Gen}} \times \text{Gender} + \beta_{\text{Edu}} \times \text{Edu}$$
$$+ \beta_{SAHK} \times \text{SAHK} + \beta_{SAH} \times \text{SAH} + \beta_{LThp} \times \text{LThp} + \beta_{Vis} \times \text{Visit} + \varepsilon \qquad (2)$$

$$\text{Conf (high)} = \alpha + \beta_{\text{IBIS}} \times \text{IBIS} + \beta_{\text{Age}} \times \text{Age} + \beta_{\text{Gen}} \times \text{Gender} + \beta_{\text{Edu}} \times \text{Edu}$$
$$+ \beta_{SAHK} \times \text{SAHK} + \beta_{SAH} \times \text{SAH} + \beta_{LThp} \times \text{LThp} + \beta_{Vis} \times \text{Visit} + \varepsilon \qquad (3)$$

In the equations α represents the constant (i.e. level of confidence and access to care if all other variables are zero) and β represents the coefficients for the respective independent variables.

To arrive at the preferred model, the study applied the block-strategy available in SPSS starting with the key independent variable, IBIS-use. After that, the independent variables were entered one by one into the model using a "block"- structure available through the command for logistic regression in SPSS. Each block added a new independent variable to the model. After all seven independent variables were entered each regression block was investigated separately and the model with the largest improvement of R-square from block 1, containing only IBIS use, was deemed the preferred model. P-values for each variables in the preferred model were noted. Statistical significance was set to p-value<0,05, with significance levels, denoted as **= p-value<0,05 and ***=p-value<0,01.

Potential confounding i.e. the sociodemographic, socioeconomic and health factors, were controlled for through the inclusion of the explanatory variables, described in section 3.2.2 into the model. Confounding that could not be specifically controlled for due to restrictions of the data was accounted for in the model through the error term ε (see equations (2) and (3)).

Statistical software SPSS, version 22 was used to handle data and perform the statistical analysis in this study.

4. Results

In this section the findings of the study are presented. Results will be described in relation to the three objectives identified in section 1.1 i.e. use of IBIS, characteristics of the IBIS user and the use of IBIS and its effect on satisfaction with care.

4.1. Use of IBIS

The use of IBIS to compare care is low in both sample populations, see table 1. In the 2010 sample, 57 out of 984 (5,8 %) respondents stated that they had used any form of IBIS to compare care. In the 2013 sample, 326 out of 5055 (6,4%) respondents stated that they had used any form of IBIS to compare care. The results show an increase in IBIS use of 0,6% between the 2010 to 2013 data sets but the validity of this increase cannot be confirmed with any statistical significance.

4.2. Characteristics of the IBIS user

In the 2010 sample, the characteristics of an IBIS user were described in the following way by the data (table 2). It was more common to have 12 or more years of education and to have visited the health care as a patient. Women were more common within the IBIS user group. The same went for individuals under 60 years. Other characteristic variables did not show any significant difference in proportions.

Table 2: 2010 Comparison of sociodemographic characteristics of IBIS users and non-users.

		Have used IBIS		Have not used IBIS		p-value
		n	(%)	n	(%)	
Self-assessed health knowledge	Good	54	(94,7)	811	(88,5)	n.s
	Not good	3	(5,3)	105	(11,5)	
Self-assessed health	Good	37	(66,1)	704	(76,2)	n.s
	Not good	19	(33,9)	214	(23,3)	
Long term health problem	Yes	26	(46,4)	30	(36,1)	n.s
	No	329	(53,6)	582	(63,9)	
Age	Young (18-39)	18	(31,6)	192	(20,7)	***
	Middle age (40-59)	29	(50,9)	300	(32,4)	
	Old (60+)	10	(17,5)	435	(46,9)	
Gender	Male	22	(38,6)	528	(57)	***
	Female	35	(61,4)	399	(43)	
Education	9 years	0	(0)	159	(17,5)	***
	12 years	24	(42,9)	407	(44,8)	
	<12 years	32	(57,1)	343	(37,7)	
Visit to care	Yes	45	(78,9)	587	(63,5)	**
	No	12	(21,1)	338	(36,5)	

Source: Vårdbarometern 2010 dataset

For the 2013 sample population, only self assessed health showed no significant difference between proportions (table 3). An individual from the 2013 sample stating that they had used IBIS was described in the following way by the data: It was more common for an IBIS user to feel that their self assessed health knowledge was good. The younger group (18-39 years) were more prominent among IBIS users. Females used IBIS more commonly than males and most users had more than 12 years of education. The individual had also most often been in contact with health care as a patient. A small majority of the IBIS users had stated that they did not have any long-term health problems.

Table 3: 2013 Comparison of sociodemographic characteristics of IBIS users and non-users.

		Have used IBIS		Have not used IBIS		p-value
		n	(%)	n	(%)	
Self assessed health knowledge	Good	302	(94,1)	4168	(88,9)	***
	Not good	19	(5,9)	518	(11,1)	
Self assessed health	Good	242	(75,4)	3713	(79,1)	n.s
	Not good	79	(24,26)	980	(20,9)	
Long term health problem	Yes	137	(43,2)	1658	(35,5)	***
	No	180	(56,8)	3007	(64,5)	
Age	Young (18-39)	120	(36,8)	1083	(22,9)	***
	Middle age (40-59)	103	(31,6)	1484	(31,4)	
	Old (60+)	103	(31,6)	2163	(45,7)	
Gender	Male	141	(35)	2398	(50,7)	***
	Female	212	(65)	2331	(49,3)	
Education	9 years	30	(9,3)	877	(18,7)	***
	12 years	122	(37,7)	2002	(42,8)	
	<12 years	172	(53,11)	1801	(38,5)	
Visit to care	Yes	239	(73,8)	2899	(61,5)	***
	No	85	(26,2)	1825	(38,5)	

Source: Vårdbarometern 2013 dataset

The two data sets showed similar profiles for the IBIS user, although the 2013 data set presented more statistically significant differences than the 2010 data set. The profile found in the 2013 data set included characteristics related to health status, while the 2010 profile did not include any health status related characteristics.

4.3. The use of IBIS and its effect on satisfaction with care

In the 2010 sample population, Use of IBIS would give a respondent lower odds of stating high confidence in PCP, this was however not a statistically significant result when controlled for other explanatory variables (p-value 0,078). Only age, gender and self-assessed health knowledge had a statistically significant impact on a respondents odds of stating they felt high

confidence in their PCP. "Young" and "Middle age" respondents had lower odds to state high confidence compared to "Old" individuals, odds ratios being 0,594 and 0,662 respectively. The opposite relationship was true for Males and those assessing their own health as good. Both groups showed higher odds of stating high confidence with odds ratios of 1,674 and 1,605 respectively. For full model odds ratios, see table 4.

Table 4: OR and p-values for logistic regression model of confidence in primary care giver, 2010

	Model R^2=0,066	
Variables	p-value	Odds Ratio (OR)
Knowledge and use of IBIS		
Yes	n.s	0,594 [0,332 – 1,061]
No	Ref.	
Age		
Old (60 +)	Ref.	
Young (18-39)	***	0,594 [0,404 – 0,873]
Middle age (40-59)	**	0,662 [0,476 – 0,920]
Gender		
Female	Ref.	
Male	***	1,674 [1,264 – 2,218]
Education		
9 years	Ref.	
12 years	n.s	0,793 [0,517 – 1,216]
More than 12 years	n.s	1,004 [0,642 – 1,570]
Self assessed health knowledge		
Not good	Ref.	
Good	**	1,605 [1,034 – 2,489]
Self assessed health		
Not good	Ref.	
Good	n.s	1,313 [0,906 – 1,900]
Long term health problems		
Yes	Ref.	
No	n.s	0,840 [0,607 – 1,161]
Have you visited healthcare?		
No	Ref.	
Yes	n.s	1,256 [0,924 – 1,708]

Source: Vårdbarometern 2010 dataset

In the 2013 sample, using IBIS gave respondents lower odds of stating that they had high confidence in their PCP than non − users (Odds ratio 0,686). Being "Young" and "Middle age" were also characteristics related to lower odds of stating high confidence in caregiver, compared to older respondents (Odds ratios 0,642 and 0,713 respectively). Respondents with 12 years of education or more had lower odds of stating they felt high confidence in their PCP (Odds ratios 0,771 and 0,781 respectively) than those with 9 years of education. Characteristics providing higher odds of feeling high confidence in PCP were "Gender" and "Self assessed health". Males were more likely than females to state high confidence, odds ratio 1,163(p-value 0,014). Respondents assessing their health to be "Good" had higher odds of stating high confidence than those with "Not good" self assessed health (Odds Ratio 1,409). For full model odds ratios, see table 5.

Table 5: OR and p-values for logistic regression model of confidence in primary care provider, 2013

	Model 1 R^2=0,028	
Variables	p-value	Odds Ratio (OR)
Knowledge and use of IBIS		
Yes	***	0,686 [0,542 – 0,868]
No	Ref.	
Age		
Old (60 +)	Ref.	
Young (18-39)	***	0,642 [0,548 – 0,753]
Middle age (40-59)	***	0,713 [0,617 – 0,824]
Gender		
Female	Ref.	
Male	**	1,163 [1,031 - 1,311]
Education		
9 years	Ref.	
12 years	***	0,771 [0,644 – 0,924]
More than 12 years	***	0,781 [0,650 - 0,938]
Self assessed health knowledge		
Not good	Ref.	
Good	n.s	1,186 [0,977 – 1,143]
Self assessed health		
Not good	Ref.	
Good	***	1,409 [1,198 – 1,656]
Long term health problems		

Yes	Ref.	
No	n.s	0,996 [0,868 – 1,143]
Have you visited healthcare?		
No	Ref.	
Yes	n.s	1,021[0,897 – 1,162]

Source: Vårdbarometern 2013 dataset

When it came to perceived access to care in the 2010 sample, the use of IBIS lowered the odds of stating that one had adequate access, with the statistically significant odds ratio of 0,291. The same goes for the age groups "Young" and "Middle age" who both gave lower odds of stating they have adequate access to care compared to the "Old" group (Odds ratios 0,608 and 0,511 respectively). For those assessing their own health as "Good", the odds ratio of 2,089 showed that they had a higher chance of perceiving that access to care was good than those assessing their health as "Not good". For all other independent variables entered in the model, no statistically significant relationship could be established. For full model odds ratios, see table 8.

Table 8: OR and p-values for logistic regression model of perceived access to care, 2010

	Model 1 R^2=0,110	
Variables	p-value	Odds Ratio (OR)
Knowledge and use of IBIS		
Yes	***	0,291 [0,160 – 0,531]
No	Ref.	
Age		
Old (60 +)	Ref.	
Young (18-39)	**	0,608 [0,374 – 0,988]
Middle age (40-59)	***	0,511 [0,341 – 0,765]
Gender		
Female	Ref.	
Male	n.s	1,257 [0,891 – 1,773]
Education		
9 years	Ref.	
12 years	n.s	0,750 [0,430 – 1,307]
More than 12 years	n.s	0,738 [0,416 – 1,310]
Self assessed health knowledge		
Not good	Ref.	
Good	n.s	1,238 [0,733 – 2,091]

Self assessed health		
Not good	Ref.	
Good	***	2,089 [1,364 – 3,198]
Long term health problems		
Yes	Ref.	
No	n.s	0,723 [0,488 – 1,071]
Have you visited healthcare?		
No	Ref.	
Yes	n.s	0,952 [0,644 – 1,407]

Source: Vårdbarometern 2010 dataset

In the 2013 sample an IBIS-user had lower odds of stating that they had adequate access to care, compared to a non-user with an odds ratio of 0,518. The same was true for younger respondents compared to the 60+, "Old" age group, odds ratio's 0,816 and 0,762 for "Young" and "Middle age" respectively. Assessing their health as "Good", gave respondents a higher chance of feeling their access to care was adequate compared to those assessing their own health as "Not good" (Odds ratio 1,788). The remaining five independent variables included in the model, "Education", "Gender", "Self assessed health knowledge", "Long term health problems" and "Visit to health care", did not show any statistically significant relationships with agreeing to having adequate access to care or not. For full model odds ratios, see table 9.

Table 9: OR and p-values for logistic regression model of perceived access to care, 2013

	Model 1 R^2=0,038	
Variables	p-value	Odds Ratio (OR)
Knowledge and use of IBIS		
Yes	***	0,518 [0,405 – 0,663]
No	Ref.	
Age		
Old (60 +)	Ref.	
Young (18-39)	**	0,816 [0,679 – 0,981]
Middle age (40-59)	***	0,762 [0,646 – 0,897]
Gender		
Female	Ref.	
Male	n.s	1,029 [0,896 – 1,181]
Education		
9 years	Ref.	
12 years	***	0,705 [0,571 – 0,871]

More than 12 years	***	0,739 [0,597 – 0,916]
Self assessed health knowledge		
Not good	Ref.	
Good	n.s	1,184 [0,953 – 1,470]
Self assessed health		
Not good	Ref.	
Good	***	1,788 [1,499 – 2,131]
Long term health problems		
Yes	Ref.	
No	n.s	0,937 [0,801 – 1,096]
Have you visited healthcare?		
No	Ref.	
Yes	n.s	0,888 [0,763 – 1,033]

Source: Vårdbarometern 2013 dataset

4.4. Sensitivity analysis

The sensitivity of the model was tested through the use of different types of variables. Using a different definition for the IBIS variable, including knowledge of IBIS sources and use of IBIS gave results differing from the ones reported in 4.3. The binary format of most of the variables in the model could have been limiting to the model and using continuous variables for e.g. Age could have given a more detailed picture. The models sensitivity for this was however not able to be tested due to restrictions of the dataset. The model is not thought to be particularly time sensitive, the factors included in the model are effectors of satisfaction with care that stay relevant over time.

5. Discussion

This study found that use of IBIS to compare care in Region Skåne was low, showing a slight increase from 2010 to 2013. The respondents that did use IBIS were to a larger extent women, younger and highly educated. They also considered themselves to be healthy and had been in contact with health care during the last 6 months from time of survey. The use of IBIS was shown to have a negative impact on the satisfaction of care, lowering the odds of stating that access to care was adequate and that confidence in primary care provider was high. This section will discuss these main findings in more detail.

5.1. Discussion of findings

5.1.1. Use of IBIS

For both 2010 and 2013 data, a small proportion of the sample population had compared care on the internet. When compared, a small increase of 0,7% could be seen from 2010 to 2013. Since the sample populations were separate cross sections, slight changes to results were to be expected and it is not certain that the 0,7% represent an actual increase in IBIS utilisation.

Both internationally and nationally low utilisation of internet services has been reported. Dixon et al (2010) show in their report on patient choice in the UK that only 8% of asked patients utilised the internet to find health information, only 4 % using the government funded site "NHS choices", created specifically to aid in the choice making process. Glenngård et al (2011) also reported low use of internet sources, stating that less than 10% of respondents from three Swedish regions, Region Skåne being one of them, stated that they used internet to search for health information. It is also stated that the elderly are less prone to use the internet as a source for their health information needs (Glenngård et al., 2011). Since the sample populations for both 2010 and 2013 have a slight majority of older people (60+) this could have affected the results.

It is also mentioned in the evidence base that the information available to compare caregivers, often performance data, is not what the public are looking for. It seems that they find it hard to interpret and the use of it is not realised among the public that would rather go on experience and recommendations from friends and family or the current care provider (Fanjiang et al., 2007, Glenngård et al., 2011). This study did not have the opportunity to incorporate these factors into the analysis although they could have had an impact on the results.

The 1177.se website, commissioned by the Swedish councils has reported rising numbers of visitors and its tool to compare caregivers was created in 2010 (Inera, 2011). Seeing this small increase in IBIS use could be due to a rising awareness of the website and its comparison tool. The question used to create the IBIS-use variable does however not specify how or where comparisons were made so linkage to 1177.se should be done with caution.

It could also be argued whether the use of information could follow the same trend as the number of active choices of care provider made. It could logically be assumed that when a lot of choices were being made, there would be an increased demand for the information. Glenngård et al (2011) raise the observation that making a choice doesn't necessarily mean switching providers but choosing to stay with the present care provider. This could decrease the perceived need for and use of information since already having used the provider before, the individual have the information they need. It would have been interesting to include a variable depicting choices made in the region during the years investigated as it could have created a clearer picture of when information is most wanted. Further research is needed to look more in depth at that aspect of the free choice reform.

Several studies emphasize that the internet is on the rise as a source of information with the society becoming more and more digitalized. The slight increase could show a beginning of the internet becoming a more "natural" source for health related information, again suggesting the need to continue investigating this issue.

5.1.2. Characteristics of the IBIS user

The current evidence base on the typical IBIS users is not very vast and most studies mention internet, not as a separate entity but as a part of a bundle making up the general term "information sources". It is however interesting to compare the profile for an IBIS user found in this study with the overall information seeking profile interpreted from the evidence base.

The profile of a typical IBIS user for the Region Skåne sample populations was similar when comparing the 2010 and 2013 samples. Women and younger people were more prone to have used IBIS for both years. In 2013 health knowledge and health status also showed significant differences after not showing any difference in the 2010 sample, this could be a consequence of the sample population's size, since the 2013 sample was bigger than the 2010 sample.

The existing evidence suggests that the demand for and use of information sources is largely dependent on an individual's socioeconomic status, age and health status (Gatto and Tak, 2008). The socioeconomic status often refers to length of education and the consensus is that having more education has a positive influence on the information seeking behaviour (Buntrock et al., 2007, Gatto and Tak, 2008). This trend was clearly seen in the profiles found in this study.

Age was a factor that provided a paradoxical relationship to information use. In terms of use of sources like the internet, elderly were described in the literature to be less likely to use them than the younger generation. Lack of knowledge of how to work a computer and the internet as well as distrust towards information found on the internet seem to create a barrier for use (Gatto and Tak, 2008). The elderly are however often described as more concerned with their health care than the young and more positive towards receiving information and getting informed. In the results from this study, the elderly make out a small part (17,5%) of the IBIS users in the 2010 sample while they make out almost a third (31,6%) in the 2013 sample. Gatto and Tak (2008) describe how the older generations bring computer skills from their work and hobbies into retirement with them, providing a possible explanation to the increase in older IBIS users. If this trend continues, the overall number of IBIS users could have potential to increase over the years since the older generation will become more skilled in computer related tasks.

Health status has also been proposed to influence the act of seeking information (Harris, 2003). These characteristics could be seen in the results of this study as well. People with long-term health problems are not as prone to use IBIS as ones without, according to the results of this study. The data does however show a change where, in the 2013 data, the proportion of IBIS users with health problems have become bigger compared to the same proportion in the 2010 sample. While the individuals suffering from a long-term health problem still make out the smaller proportion, the development is interesting as it shows proportions close to being equal, indicating that having a health problem would not influence the information seeking behaviour.

Primary care is as stated in the introduction, a part of the health care system that handles all forms of illnesses (SFS, 1982). It could be theorised that the use of its services differs markedly between an individual with a persistent health problem and one that leads a mostly healthy life and thus also the concern with what provider to use would differ. It would be logical that having a long term health problem would lead a person to have more contact with the health care and thus also be more concerned with the care they are getting having a certain quality. This could lead to an increase in the use of IBIS but it could also lead to a smaller use of IBIS because of close contacts with other information sources like care personnel.

In the literature surrounding health status and information seeking behaviour, it is said that having a health problem can interfere with the information seeking process because of the energy it takes (Harris, 2003). Fanijang et al (2007) and Schneider et al (2001) proposes that searching for and interpreting information is such a laborious task that to willingly pay the energy it takes to do it, there has to be a certain urgency to the situation. This urgency is often not associated with the choice of primary care provider. Having a health problem would perhaps provide the urgency but the energy might not be there to put into the info search, possibly explaining the lower proportion of sick people among IBIS users.

The profile shown for the IBIS user in this study speak to the concerns regarding inequalities of care as the IBIS users in Skåne seem to be more privileged compared with non-users.

5.1.3. The use of IBIS and its effect on satisfaction with care

The finding of IBIS users being less likely to state that they feel high confidence in their PCP and less perceived access to the care they need is somewhat surprising and counteracts the assumed direction of the effect in the analytical framework. Literature emphasise the importance of the informed choice and its positive impact on satisfaction with care (Bornstein et al., 2000, Fanjiang et al., 2007, Propper, 2010), so a positive odds ratio for IBIS use was expected. The proportions using IBIS was however small (approx 6% for each year) and this might have affected the regression analysis.

If it is assumed that the IBIS use had lead to an informed choice, the results could be interpreted in two ways. They could present that even though an informed choice was possibly made, the confidence in care and perceived access was not satisfactory. To turn the results around and look at it from another angle, it could be the case that the IBIS users are in fact using IBIS because of their dissatisfaction with their current care and therefore compare caregivers to find a new, better caregiver. This reversed effect originating in low satisfaction and impacting IBIS use, was brought up in the analytical framework. This way of looking at the results would put the results more in line with the positive relation between information and satisfaction that can be deciphered from the literature regarding choice and use of health information.

To be taken into consideration when reviewing this "what came first" scenario is also the overall information seeking behaviour of someone using IBIS to compare caregivers. It could be that IBIS users are more prone to search for more information about health in general. While the use of the internet as a tool to help patient choice is low, Berendsen et al (2010) did show that when it came to finding info on illness and treatments almost a third of respondents (30%) preferred using the internet. Being better or maybe more, informed about ones illness and different treatment could possibly change the expectations one has on the interaction with the caregiver. With higher expectations from the patient the scrutiny of the caregiver's actions would be more intense and could lead to a lower satisfaction with care if the patient does not get what he or she expected from the visit to health care. They could also have misinformed themselves, and might feel discontent when the doctor does not provide the diagnosis or care they had imagined to get. This angle on the results from this study is simply speculation since the general information seeking behaviour couldn't be measured with the data available.

5.2. Methodological discussion

This study presents results in a field that has not been widely explored. Assumptions can only be drawn from the existing literature on information seeking behaviour and satisfaction with care as separate topics. The strength of this study is that no investigation of the sort has been carried out using population survey data to the knowledge of the author. No one has either looked at the association between information seeking behaviour and satisfaction with care in the Swedish setting. The information seeking behaviour of the population is important to investigate to further inform policy and law development in relation to development of information services of all kinds, not only internet based.

As noted in section 3.1, "Vårdbarometern" is designed as a cross sectional study, This study design takes away the possibility to infer causality and the results of this study are representations of what the situation looked like at the time of the surveys. While not making the result less interesting, following the issue with another study design would maybe be preferable in the future to be able to determine the actual impact of IBIS use on satisfaction with care. The data was however of good quality and the data collection through random sampling means that the results are a good representation of the situation for the population in Region Skåne that were 18 years and older at the time of the surveys.

The different sample sizes of the years with the 2013 sample having 5000 more respondents than the 2010 sample could be brought up as a limitation to this study, increasing the sample size is linked to an increase in accuracy and reliability of the results (Achengrau and Seage, 2007) and it was seen that the 2010 sample did produce more non-significant results than the 2013 sample. This result might represent actual differences between the population's views and attitudes but comparisons should be made with caution due to the different sizes of the samples and the fact that they were different groups of respondents. The fact that the 2010 survey also was the first undertaken after a restructuring of the survey should be taken into consideration when reviewing the results of this study (Sveriges Kommuner och Landsting, 2011). Questions might have been rephrased to ensure better understanding among respondents. This study did however try to evade this issue by using questions that to a large degree had the same phrasing in both the 2010 and 2013 questionnaire.

The statistical methods used are deemed suitable for the intended purposes and created the results that related well to the objectives. The logistic regression model was created according to the analytical framework (see section 2.4), developed from literature found surrounding patient choice, satisfaction with care and health information and information use. Since the field of IBIS use in relation to satisfaction of care is fairly new and not much research has been done, the model is anchored in evidence from different research fields to ensure a comprehensive and coherent assessment of the main aim of the study. As seen in the sensitivity analysis (section 4.4) the sensitivity of the model was tested and possible sensitivity issues were addressed.

Possible confounding factors like age, education and health status that has been shown to influence both information use and satisfaction in the literature, were controlled for in the model to the best of the dataset's ability. The dataset provided limitations since the data was already collected and not all factors that could have been deemed important to control for, could be included since there was no data on them. Such variables could have been "choice made" and more specific internet use variables. The effect of missing information is important as it may render the estimated coefficients biased. This is a common problem in empirical research, and suggests that interpretations of the findings need to be made with due caution.

6. Conclusions

This study adds to the small pool of evidence in the growing field of research on the influence of information seeking behaviour in health care systems. With the increased popularity of patient involvement and using the internet as an information source it is important to provide the information best suited for the situation in the best possible way. As this study and others before it have shown, the utilisation of information sources on the internet is low and this study also indicates that the proposed benefits of it might not be supported by reality.

The profile of the IBIS user, identified in this study indicates that there are certain groups that are more prone to have the will and the ability to use the internet as a source for information, groups that are also mentioned in relation to inequality, an argument often surrounding the patient choice question. It is important to encourage further research into the subject of IBIS and patient choice to understand where the efforts should be put to make it available to all and make reality of its proposed benefits.

Acknowledgements

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