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Icelandic citizens' everyday life health information behaviour

Ágústa Pálsdóttir

The article presents some of the results from research on Icelandic citizens' behaviour regarding information about health and lifestyle in the context of their everyday life. The focus is on the socio-cognitive aspects of information behaviour. The research was carried out as a postal survey using a random sample of 1000 people aged 18–80. The findings support the notion that human information behaviour is being shaped by cognitive and social factors together. The results demonstrate a relationship between respondents' information seeking styles, sex and education. Women were found to seek more information than men, and they were also found to be more likely to consider the information useful than men. Respondents' level of education appears to affect their information seeking habits, especially among women. Level of education also relates to how people value the reliability of information from the different sources.

Keywords

demographic variables, everyday life, Icelandic citizens, information behaviour, information seeking

Introduction

This article presents some of the results from research on Icelandic citizens' behaviour regarding information about health and lifestyle in the context of their everyday life. The purpose of the research is to try to understand how the modern media can contribute to the lifestyles and health of people in different socio-demographic groups. The focus is on the socio-cognitive aspects of information behaviour.

In recent years health behaviour and the promotion of health have received increasing attention. According to the World Health Organization the purpose of health promotion is to enable individuals 'to increase control over, and to improve, their health' [1]. The main idea behind health education and health promotion is the assumption that by increasing citizens' access to knowledge, their health habits can be changed in such a way as to improve their health. Health promotion therefore consists among other things of assuring citizens' access to health information and the knowledge necessary to make informed health choices. Most studies on health information investigate either patients' information behaviour or the flow of information among those who work within the health care system (see e.g. [2–6]). Few studies examine the factors that influence the everyday life communication profile of people that are thought of as healthy.

Social background and health: importance of lifestyle

People's health and well-being is moulded by many different factors. Factors which are difficult to affect, such as the influence of genetic heritage and age on human health, are well known. It is, though, interesting to see that e.g. coronary diseases have been declining throughout the western world and that among the explanations suggested is success in controlling disease by adopting new lifestyles [7, 8]. Researchers have studied the impact of social reality and the findings imply that social background affects citizens' health [9]. Furthermore, socio-economic factors during childhood have been related with higher risk of mortality in adulthood [10, 11]. A recent survey in the Nordic countries has shown that children and adolescents living in lower social conditions have worse health than those who live in higher social conditions [12]. Although social background has been recognized as having influence on the health of citizens, the reasons for the difference among social groups are not fully understood. Education has been identified as an important factor in this context [13–16]. It has also been pointed out that improvements in lifestyle and health do not affect all social classes equally, and that people belonging to the higher classes are those who tend to be influenced first [17, 18]. Among the explanations are that people in the higher social classes can more easily interpret knowledge and convert it into a change in lifestyle [19].

Social influence on information seeking behaviour

Studies focusing on information seeking and use of information sources have indicated that different social groups do not behave in the same way and that the possibilities for making use of the existing sources of information are socially determined. The significance of education has been pointed out. Better educated people seek more information than people with less education, the range of information sources used by them has a greater variety, and there are indications of a preference for printed sources rather than television or informal sources [20–23]. Women have been reported to be more likely than men to seek information and to be better informed about health [22, 24]. Those who belong to the more disadvantaged groups in society have been described as seeking information less often and using a more limited selection of information sources in their everyday life [25–28].

Social cognitive theory

The research uses Bandura's social cognitive theory as a theoretical framework. According to Bandura, social cognitive theory is concerned with exploring the social diffusion of new styles of behaviour [29]. The emphasis of the theory is on the social networks that provide a pathway through which styles of behaviour spread and are supported, and on the psychosocial factors that control their acquisition and adoption. In other words, the focus is on the interplay of cognitive and social factors and how they together shape behaviour.

The perspective of social cognitive theory is that people operate in a broad network of social systems which they are assumed to take part in shaping as well as to be shaped by. 'People are self-organizing, proactive, self-reflecting, and self-regulating, not just reactive organisms shaped and reshaped by environmental events or inner forces' [29: 266]. The viewpoint of the theory is based on triadic reciprocal causation in which there is a bidirectional interaction between behaviour, environmental factors, and intrapersonal factors, especially cognitive processes. In this model, referred to by Bandura as 'reciprocal determinism' [30], there is a transactional view of self and society where these factors all work together and both affect and are affected by each other.

Social networks: diffusion of behaviour patterns

People receive a great quantity of information from both personal experiences and vicarious experiences, that is, reading, observing, or listening to others. Vicarious experiences, or observational learning as it is referred to, is emphasized as being especially important. If people had to rely on direct experiences as a source of knowledge, the process of learning would become extremely time consuming. Therefore, observational learning to a great extent influences people's beliefs and their understanding of social reality.

In their everyday life people are linked, directly and indirectly, to social networks that serve as communication systems through which they receive motivation and advice about desired changes in behavioural patterns. Family and peers can provide strong modelling influences. Also, persons that have high status within an individual's social milieu can partly affect which behavioural choices are made. However, although a great deal of social learning takes place, either intentionally or as a coincidence, by observing models in the immediate physical and social environment, such modelling has limited potential. The mass media, on the other hand, have the capacity to offer a huge quantity of information about 'human values, styles of thinking, and behaviour patterns' [29: 271]. By use of modern media technology this information can be spread more rapidly through communities and societies than ever before.

By operating symbolically on the information gathered by observational learning, people can increase their knowledge and understanding of causal relationships. Which actions will be observed, the meaning given to them, their effects and how information that can be drawn from them is organized for later use, are partly determined by cognitive factors. But social cognitive theory also emphasizes the importance of social systems on human thought and on analysing the social networks through which new styles of behaviour are diffused.

Socio-cognitive factors and information behaviour

People live their lives in social systems that are formed around a number of factors; among these are gender and educational level. The practices that people adopt in their everyday lives are partly shaped by the influences that they receive from their social environment. In the process of making behavioural choices people are motivated to decrease any punishment from the environment and to increase reinforcement, that is, to make decisions that are valued by their social environment. Social systems differ in the way they place value on various issues as well as the practices around the issues [31, 32]. For example, the message obtained by members of some social systems may be that it is desirable for people to orient themselves about topics such as health and lifestyle, and thereby seeking and paying attention to information about them may be considered a habit worth pursuing. On the other hand, the messages within other social systems may be entirely different, placing a lower value on these topics, and consequently seeking information may not be considered important. Thus, the nature of the messages about the desirability of information seeking may depend on the types of social environment that people select and construct.

This is not to say that behaviour is only controlled by immediate gratification because people are also capable of making choices based on moral frameworks, or making temporary or long-term behaviour plans and working towards goals that are built on diversely valued reinforcements. It also follows that the internal standards that people set for themselves are being modified according to changes in their knowledge, and educational level can therefore be seen as a cognitive as well as a social factor [31].

There is also a distinction between obtaining messages about desired behaviour from the environment and acting on them, and Bandura has put emphasis on the importance of self-efficacy as a cognitive mediator of action [29–31]. Self-efficacy beliefs are people's judgements about whether or not they will be able to carry out a certain behaviour and if so how successful they will be. The focus is not on people's skills but on what they believe that they can do with their skills under different circumstances. Another type of expectancy that needs to be taken into consideration is outcome expectancy. Outcome expectancy can be described as judgement of the likely results of performing a task. Individuals who believe that they have the necessary skills and will be able to perform well at something that they want to do, and believe that the behaviour will lead to a favourable outcome, are considered more likely to act than those who do not.

Although not discussed here, the research examined the role of self-efficacy as a cognitive mediator of information behaviour. The attention in this article, however, is on the connection between the participant's information behaviour and socio-cognitive factors, that is, their gender and educational level.

The concept of information behaviour: active and passive information seeking

The literature on information seeking and use expresses differences in the meaning and utilization of the term 'information behaviour'. However, according to Wilson's definition, information behaviour includes 'the totality of human behaviour in relation to sources and channels of information, including both "active" and "passive" information seeking and

information use' [33]. By including two separate styles of information seeking the definition mirrors the viewpoint of a very small but increasing number of studies that have in the past few years begun to explore information seeking in more detail.

Active information seeking refers to behaviour where individuals experience a lack of knowledge and act on it by seeking information, or 'the purposive seeking for information as a consequence of a need to satisfy some goal'. This type of information seeking behaviour has been a traditional subject of studies on information seeking.

Passive information seeking, on the other hand, refers to instances such as when use of the mass media results in information acquisition even though information seeking was not intended and the person may not mean to act on the information received. This recognition is comparable with the distinction made between incidental information acquisition and purposeful information seeking discussed by Williamson [34]. Williamson, in a study of older adults in Australia, found that people often came across information in situations where information gathering was not intended and people were not even aware of a knowledge gap, for example while using the media or communicating with other people. Also noteworthy is the term 'information encountering' introduced by Erdelez to refer to accidental information discovery, for instance when people unexpectedly come across information while searching for other information, or when information seeking was not intended [35].

Furthermore, it is interesting to observe that the two types of information seeking, active and passive, can be related to social cognitive theory, where Bandura states that social learning can take place intentionally or as a coincidence [29].

Method

The research was carried out as a postal survey. The sample, representing the adult population in Iceland, consisted of 1000 people aged 18–80 who were randomly selected from the national population registry. The data were gathered from October to December 2002. One reminder letter was sent and two telephone calls were made to non-responders. The response rate was 51 per cent.

Characteristics of the sample were compared with norms for the population, and it was determined that regarding age and geographical residence it is representative of the Icelandic population. The division between the sexes is not representative at confidence limits of 95 per cent. The response rate for women (54.6%) was higher than for men (45.4%) but is more equal across the population.

Questions about health information behaviour

Source preferences and the different kinds of information seeking styles were measured by presenting a list of 23 information sources and asking questions about active and passive information seeking for each source. The questions had a five-point response scale ('very often' to 'never'). Relevance was measured by asking about the usefulness and the reliability of information from the different sources, using a five-point response scale ('very useful' to 'don't know').

Demographic measures

Standard demographic measures included variables that previous research has shown to influence health behaviour and information behaviour. Among these are gender, income, education and occupation, and geographical residence. Education level was measured as the highest level of completed education. Three levels were distinguished: elementary school (10 years of education; 31.7% of the sample), secondary school (14 years; 44.1%) and university/college (24.2%).

Statistical tests

Factor analysis was used to extract underlying factors on how and from where people gather information about health and lifestyle, and how they value the usefulness and reliability of information from different information sources. It was expected that some of the questions would measure the same factor, or different aspects of the same factor, and that one scale could be used to measure each factor. In each case three factors appeared, containing between five and eight items. The factors were named 'the mass media', 'the Internet', and 'information sources by health specialists'. A principal axis with oblique rotation was used where correlation between factors was higher than 0.3. The factors explained 50.0 per cent or more of the total variance (see Table 1).

The criteria for factor loadings were set above 0.3 so that each factor would explain at least 9 per cent of the distribution of each variable. According to CoAmreys criteria, 80.8 per cent of the factors have factor loadings that are excellent (> 0.71), very good (> 0.63) or good (> 0.55) [36]. Of all the factor loadings, 52.1 per cent have excellent loadings, 21 per cent very good loadings and 8.2 per cent good loadings; 20 per cent of the factors have loadings under 0.55.

To measure the quality of the scales and show how well different questions measure the same factor, item analysis was used (see Table 2). If consistency of the scale is to be satisfactory, the recommended criterion for Cronbach's alpha is > 0.70 .

Results

When examining the relationship between sex and education and how often people seek information in the media (Table 3), the results show that women (mean $M = 2.6$) seek information more often than men ($M = 2.3$). There is also a difference according to respondents' education: people with secondary school education ($M = 2.6$) seek this

Table 1 Ratio of explanation of each factor of total variance

Questions	Explained variance (%)
Seeking information	50.0
Finding information when not intentionally seeking it	57.5
Usefulness of information	58.7
Reliability of information	60.2

Table 2 Item analyses for factors: the mass media, the Internet and health specialists

<i>Factor</i>	<i>Cronbach's alpha</i>	<i>Average correlation</i>	<i>Highest correlation</i>	<i>Lowest correlation</i>
Seeking information in the media	0.90	0.52	0.75	0.36
Seeking information on the Internet	0.89	0.62	0.74	0.51
Seeking information by health specialists	0.80	0.45	0.58	0.31
Finding information in the media when not intentionally seeking it	0.88	0.51	0.73	0.37
Finding information on the Internet when not intentionally seeking it	0.90	0.66	0.76	0.59
Finding information from health specialists when not intentionally seeking it	0.84	0.47	0.71	0.26
Usefulness of information in the media	0.90	0.72	0.58	0.38
Usefulness of information on the Internet	0.91	0.70	0.77	0.57
Usefulness of information by health specialists	0.85	0.49	0.67	0.34
Reliability of information in the media	0.90	0.52	0.71	0.42
Reliability of information on the Internet	0.87	0.67	0.79	0.55
Reliability of information by health specialists	0.86	0.57	0.73	0.46

information more often than those who have elementary school education ($M = 2.4$) (Duncan, $p < 0.05$). The mean square for people with a college/university degree is 2.5.

As can be seen from Figure 1, the effects of sex and education affect how often people seek information on the Internet. The figure shows that there is no difference between the sexes among those who have elementary education, but there is a difference among those who have finished secondary school and college/university education. In both educational groups women are more likely to seek information than men. The difference appears to become stronger as the level of education rises.

Sex and education affect how often people seek information by health specialists. Figure 2 shows that women seek information more often than men. The difference between the sexes is less among those who have elementary school education than among those who have finished secondary school and college/university. Men who have college/university education seek information more often than those who have a

Table 3 Seeking information in the media: sex and education

	<i>Sum of squares</i>	<i>Degrees of freedom (d.f.)</i>	<i>Mean square</i>	<i>F-value</i>	<i>P-value</i>
Sex	9.8	1	9.83	14.31	0.00
Education	4.7	2	2.37	3.45	0.03
Sex × education	1.3	2	0.64	0.94	0.39
Residual	316.8	461	0.69		
Total	3258.2	467			

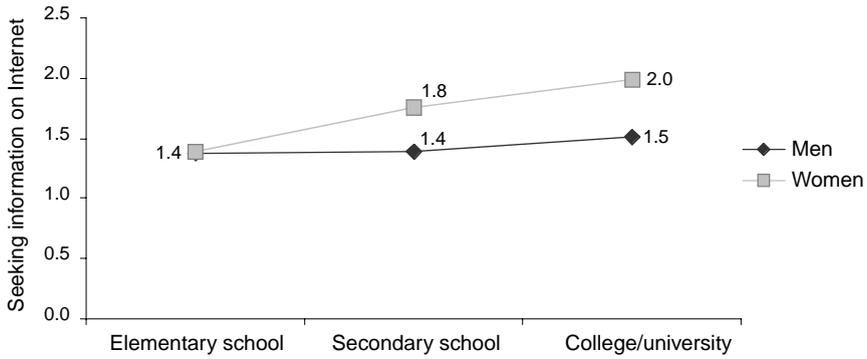


Figure 1 Interaction of sex and education on how often people seek information on the Internet

secondary school education or elementary school education. As women’s education level gets higher, they seek information more often.

Women ($M = 3.2$) find information in the media when not intentionally seeking it more often than men ($M = 3.9$) (Table 4).

How often people find information on the Internet when not intentionally seeking it is affected by sex and education. Figure 3 shows that there is no difference between the sexes among those who have finished elementary school, but the difference gets larger as the level of education gets higher, with men coming across information less often than women.

The effects of sex and education interact on how often people find information by health specialists when not intentionally seeking it. As Figure 4 shows, there is no difference between the sexes among those who have finished elementary school, but the difference gets larger as the level of education gets higher, with women responding as having found information more often than men.

People were asked how useful information from different information sources was found to be. Women ($M = 2.6$) consider information in the media more useful than men

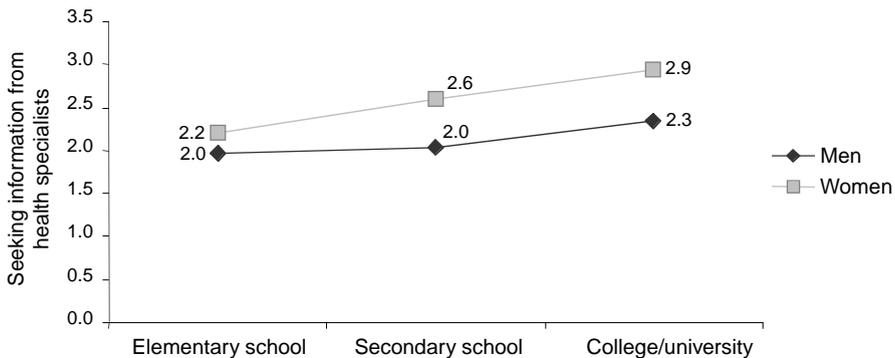
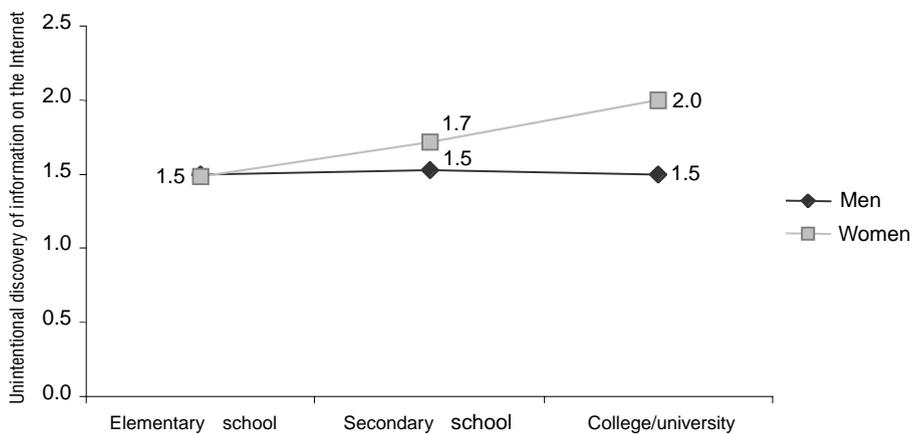


Figure 2 Interaction of sex and education on how people seek information by health specialists

Table 4 Finding information in the media when not intentionally seeking it: sex and education

	<i>Sum of squares</i>	<i>Degrees of freedom (d.f.)</i>	<i>Mean square</i>	<i>F-value</i>	<i>P-value</i>
Sex	11.2	1	11.2	16.3	0.0
Education	1.2	2	0.6	0.9	0.4
Sex × education	0.1	2	0.1	0.1	0.9
Residual	313.4	458	0.7		
Total	4559.7	464			

**Figure 3** Interaction of sex and education on how often people find information on the Internet when not intentionally seeking it

($M = 2.5$) (see Table 5). There is also a difference according to level of education, as people with college/university education ($M = 2.4$) find the information less useful than those who have finished secondary school ($M = 2.7$) (Tukey, $p < 0.05$). For people who have finished elementary school, $M = 2.6$.

Figure 5 shows that the effects of sex and education interact on people's opinion of the usefulness of information on the Internet. Women are more likely to consider the information useful than men. There is a small difference between the sexes among those who have finished elementary school and secondary school. Opinion on usefulness increases with both sexes when education moves from elementary school to secondary school. However, opinion on usefulness reduces among men with college/university education but there is no change in the opinion of women.

Respondents' opinion on the usefulness of information in sources by health specialists differs between the sexes (Table 6). Men ($M = 2.3$) consider the information less useful than women ($M = 3.2$).

People were asked how reliable information in the media was found to be. Opinion differs among those who have finished college/university education and those who have

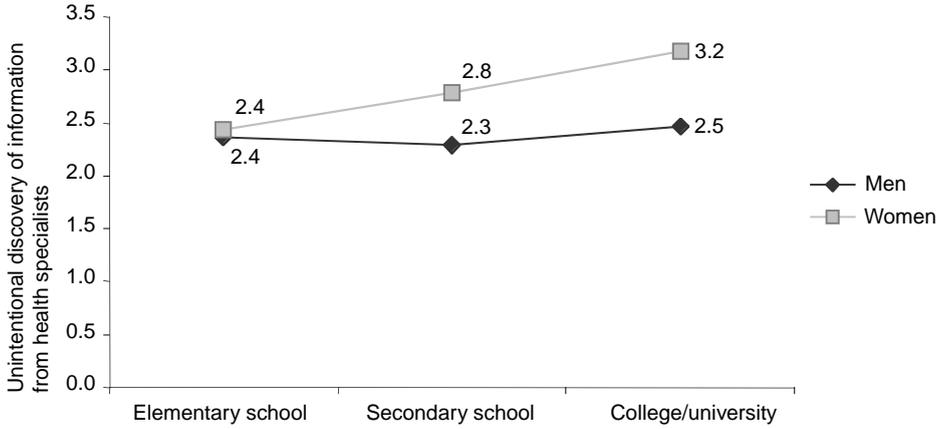


Figure 4 Interaction of sex and education on how often people find information from health specialists when not intentionally seeking it

Table 5 Usefulness of information in the media: sex and education

	<i>Sum of squares</i>	<i>Degrees of freedom (d.f.)</i>	<i>Mean square</i>	<i>F-value</i>	<i>P-value</i>
Sex	1.12	1	1.12	3.27	0.07
Education	3.97	2	1.98	5.81	0.00
Sex × education	0.49	2	0.25	0.72	0.49
Residual	103.39	303	0.34		
Total	2158.22	309			

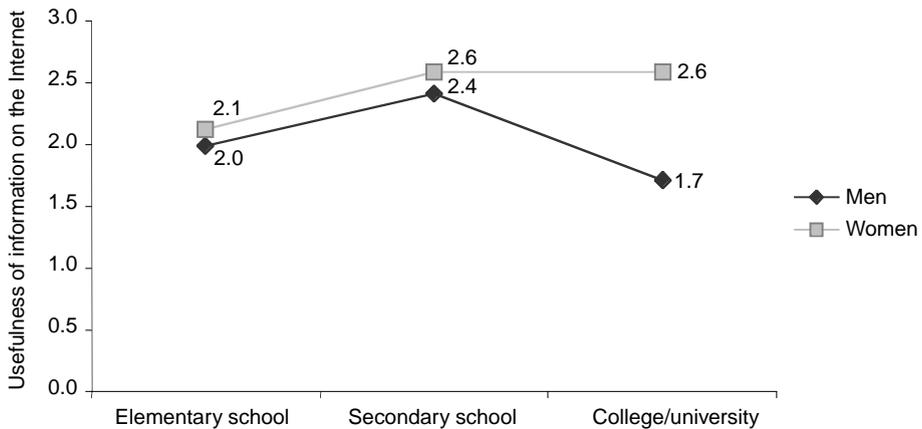


Figure 5 Interaction of sex and education on beliefs about the usefulness of information on the Internet

Table 6 Usefulness of information from health specialists: sex and education

	<i>Sum of squares</i>	<i>Degrees of freedom (d.f.)</i>	<i>Mean square</i>	<i>F-value</i>	<i>P-value</i>
Sex	6.48	1	6.48	20.93	0.00
Education	1.26	2	0.63	2.03	0.13
Sex × education	0.22	2	0.11	0.36	0.70
Residual	87.97	284	0.31		
Total	2767.18	290			

finished secondary school education (see Table 7). People with college/university education ($M = 2.3$) consider the information less reliable than those with secondary school education ($M = 2.6$). For people with elementary school education, $M = 2.5$ (Tukey, $p < 0.05$).

The effects of sex and education interact on people's opinion of the reliability of information on the Internet. Figure 6 shows that there is no difference between the sexes among people with elementary education and with secondary education. With both men and women there is an increase in belief when they move from elementary school to secondary school. There is however a decrease in belief among both men and women when they move to college/university education, with the decrease being stronger among men.

Opinion of the reliability of information in sources by health specialists varies by educational level (Table 8). The difference is between those who have an elementary education ($M = 3.2$) and those who have college/university education ($M = 3.5$), with the latter group considering the information more reliable than the former. For people with secondary education, $M = 3.2$ (Tukey, $p < 0.05$).

Conclusion

Social cognitive theory states that people live in social networks that serve as communication systems through which they receive motivation and advice about behavioural patterns. What people observe, and how they understand what they receive as well as

Table 7 Reliability of information in the media: sex and education

	<i>Sum of squares</i>	<i>Degrees of freedom (d.f.)</i>	<i>Mean square</i>	<i>F-value</i>	<i>P-value</i>
Sex	0.58	1	0.58	2.10	0.15
Education	3.19	2	1.59	5.78	0.00
Sex × education	0.00	2	0.00	0.01	0.99
Residual	65.87	239	0.28		
Total	1568.38	245			

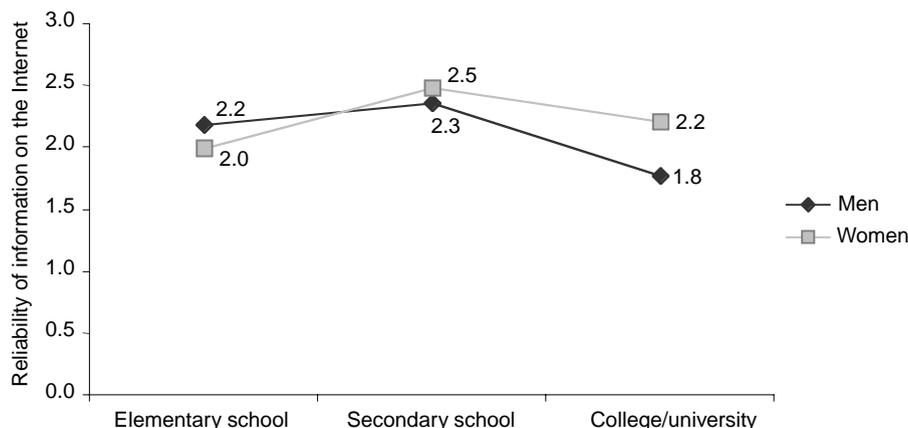


Figure 6 Interaction of sex and education on belief about reliability of information on the Internet

its effects, are partly determined by cognitive factors, and partly by the influences that social systems have on human thought by spreading and supporting ideas of behaviour. The findings of this research support the notion that human information behaviour is being shaped by cognitive and social factors together.

The results of the research are in line with the findings of previously mentioned research on information seeking behaviour. The main results of the research are that there is a relationship between respondents' information seeking styles, sex and education. Regarding the relationship between information seeking behaviour and sex, the findings are consistent. Women were found to seek more information about health and lifestyle than men from all three types of information sources – the media, the Internet and health specialists – whether by active or by passive information seeking. Women were also found to be more likely to consider the information useful than men. Respondents' level of education appears to affect their information seeking habits, especially among women. The findings suggest that better educated women are more likely to seek information, by both active and passive seeking, than women with less education. Level of education also relates to how people value the reliability of information from the different sources. People with higher education (college/university) seem to favour information from sources by

Table 8 Reliability of information by health specialists: sex and education

	<i>Sum of squares</i>	<i>Degrees of freedom (d.f.)</i>	<i>Mean square</i>	<i>F-value</i>	<i>P-value</i>
Sex	0.82	1	0.82	3.14	0.08
Education	4.04	2	2.02	7.69	0.00
Sex × education	0.84	2	0.42	1.60	0.20
Residual	89.31	340	0.26		
Total	3929.73	346			

health specialists, and to be more sceptical about the reliability of information in the media and on the Internet, than the other two educational groups.

As for the generalizing the results, it needs to be kept in mind that the sample was not entirely representative of the population, with women more willing to respond to the survey than men. This fact, however, may also be an indicator of social influences. Can it be that the message distributed through the social networks is that health and lifestyle are women's issues rather than men's?

Appendix

This appendix explains further the statistical methods used in the analysis of the data: factor analysis, item analysis and factorial analysis of variance (FANOVA), also simply called analysis of variance (ANOVA).

Factor analysis is based on the idea of grouping together questions that measure different aspects of the same factor. It is based on correlation calculations, where the correlation coefficients score is on the interval between -1 and $+1$. A correlation of 0 indicates that there is no relationship between the variables, and a correlation of $+/-1$ indicates that the relationship is complete [37].

A factor has been defined as a construct, that is operationally defined by its factor loadings. Factor loadings are the correlations of variables with a factor [37]. For example, the analysis here shows that questions about information gathering on the Internet by use of different information sources, for example websites of the health authorities, websites by others, journals or newspapers on the Internet, discussion or news groups on the Internet, and advertisers on the Internet, are all loaded on the same factor called 'the Internet'.

A distinction is made between confirmatory factor analysis and exploratory factor analysis. When confirmatory factor analysis is used the number of factors to appear have been defined in advance, based on a theory and/or former studies. In exploratory factor analysis the emphasis is on exploring unknown associations between variables [37].

In this research, where information behaviour is being analysed, that is source preference, information seeking styles and how people value the relevance of the different information sources, the results from the factor analysis were used to compute scales built on the factors that were extracted. In order to verify the reliability of the scales, item analysis was used, but this examines the internal correlation between the variables that belong to each factor. After this an analysis of variance was used to examine if the respondents' information behaviour differed by gender or educational level.

Analysis of variance is used to examine if there is a difference between the means of three or more groups on a specific dependent variable. In ANOVA, the effects of more than one independent variable are examined, and one of the advantages of this method is that the group that inferences are made about can be expanded. In this research, for example, inferences can be drawn about the effect of both the participants' gender and their educational level.

ANOVA is conducted to examine the effect of one independent variable on a dependent variable, with the effects of other independent variable(s) in the model being controlled for. It also shows both the main effect for each variable and whether there is an interaction between variables. Interaction means that the effect of one independent variable on a dependent variable is determined by the value of another independent

variable. For example, the interaction between gender and educational level can reveal that there is no gender difference on the dependent variable among those who have finished elementary school, although there is a gender difference among those who have finished secondary school. In that case, the effect of gender on the dependent variable is determined by the respondents' educational level.

If the results of an analysis of variance show that the means of the groups in the model differ, if the groups are only two (e.g. sex) it is enough to observe the means to interpret where the difference is. If, on the other hand, the groups are more than two (e.g. three groups of educational level, i.e. elementary school, secondary school and college/university), a so-called *post hoc* test needs to be conducted to examine which of the groups differ. In this research a Schéffe *post hoc* test was used, except in one case where Duncan was used, but these tests are interpreted in the same way.

There are several assumptions for using ANOVA. The first is that the dependent variable has to be on an interval scale. The second is that the dependent variable has to be normally distributed within each group observed (e.g. within each gender). The third is that the sample must be randomly selected or the respondents must be randomly assigned to groups. The fourth is that the size of the groups has to be approximately equal. The fifth is the homoscedasticity of variance, that is the distribution of the dependent variable within each group has to be homogeneous between groups [38, 39].

In ANOVA a null hypothesis is tested, but in most cases it argues that the observed means do not differ. The purpose with analysis of variance, as with other tests of significance, is to examine whether or not the null hypothesis can be rejected. The decision is built on a comparison of the mean sum of squares of the explained variance and the mean sum of squares of the residual. The mean sum of squares is found by calculating the mean of all the sums of squares and dividing by the appropriate degrees of freedom. Sums of squares include RSS (within-groups sum of squares), ESS (between-groups sum of squares) and TSS (total sum of squares). Degrees of freedom for ESS are the number of groups in the model minus 1; degrees of freedom for RSS are the size of the sample minus the number of groups; and degrees of freedom for TSS are the size of the sample minus 1.

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