Zeitschrift: Studies in Communication Sciences : journal of the Swiss Association of Communication and Media Research

Herausgeber: Swiss Association of Communication and Media Research; Università della Svizzera italiana, Faculty of Communication Sciences

Band: 5 (2005)

Heft: 2

Artikel: Active acquisition or passive reception : health information literacy among fifty finns in differing health situations

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DOI: https://doi.org/10.5169/seals-790926

Studies in Communication Sciences 5/2 (2005) 57-74

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ACTIVE ACQUISITION OR PASSIVE RECEPTION: HEALTH INFORMATION LITERACY AMONG FIFTY FINNS IN DIFFERING HEALTH SITUATIONS

This paper presents some results of an interview study, conducted in 2001, on 50 Finnish citizens aged between 20 and 42; interviewees include pregnant women, diabetics and a control group consisting of healthy persons. A cluster analysis showed three information source profiles named the professionals' cluster (n=19), the popularized science cluster (n=20), and the everyday information cluster (n=11). Differences were found between the clusters concerning the health information literacy, defined as knowing when health information is needed, how and where to find information about health, and how to evaluate and use this information in everyday life. The respondents within the popularized science cluster were most health information literate; they were the most active at information seeking, showed the best knowledge, and were most self-confident and positive towards health information. In addition, they smoked less and used less alcohol. The everyday information cluster respondents showed the weakest health information literacy.

Keywords: attitudes, behaviour, information seeking, knowledge, sources.

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1. Introduction

Overweight and obesity constitute a growing problem today (e.g., Tullao 2002: 11), because they lead to an elevated risk for cardiovascular disease, diabetes of type II, and certain cancers (e.g., World Health Organization 2003b). These diseases could to a large extent be prevented by attention to the diet and a healthy lifestyle. The World Health Organization estimates that as many as 80% of the cases of cardiovascular disease, 90% of the cases of type II diabetes, and about 30 % of the cases of cancer could be avoided by changing the diet, increasing physical activity and quitting smoking (World Health Organization 2003a: 43). Information provision and education of the public are proposed and used to a large extent for behaviour changing purposes (e.g., French et al. 2001; Uusitalo et al. 2002: 8f; World Health Organization 2003a: 137). The amount of information about health, especially in the mass media, is also tremendous; already in the late 1980's, at least one-fourth of all the articles in daily newspapers were in some way health-related (Atkin & Arkin 1989), and health is important on local American television news, too (Kaiser Family Foundation 1998). A total of 389 representations of health were found in a sample of 60 hours of programmes on Dutch television. In these representations, food was one of the most commonly represented items (Fennis 1999: 29 ff.).

Food-related health information is obviously important to the public, as well. Forty-seven percent of 14,000 persons in EU member states said they frequently seek information on healthy eating (de Almeida 1997). Still, there seems to be a gap between given information and healthy behaviour. Don Nutbeam writes: "It is now well understood from experiences in addressing specific public health problems of tobacco control, injury prevention and prevention of illicit drug use, and the more general challenge of achieving greater equity in health, that education alone is generally insufficient to achieve major public health goals." (Nutbeam 2000: 261). This paper presents some results from a larger research project concerning food-related health information, health knowledge and eating and health behaviour among fifty Finns in differing health situations (Eriksson-Backa 2003).

2. Problems with communicating health-related information

The amount of information provided is not equivalent to the amount of information understood and profited by, according to many studies. Some

of the problems, which might prevent the understanding of given health or medical information, are related to the information providers and include use of medical terminology, lack of communication skills and an arrogant attitude among doctors, as well as lack of time (Glenton 2002; Lyons et al. 2002; Majerovitz et al. 1997). Lack of information, or only orally given information, which was easily forgotten, diminished understanding and led to more unhealthy behaviour in the study by Browne and colleagues (Browne et al. 2000). In some cases, the given information was shown to be confusing and contradictory (Hirvensalo et al. 2005; Laitinen et al.1999).

Other problems are related to the receiver of information. Lack of education might be one barrier. The relation between lower levels of literacy and problems to understand medical information has been suggested (Gannon & Hildebrandt 2002; Parker et al. 2003). Studies on medical information on the Internet showed that it was often too difficult to understand, especially among people with lower levels of education (Berland et al. 2001; Murero et al. 2001). Relevant information on the Internet is, furthermore, often in other languages than the own mother tongue, which can diminish the interest in the existing information especially among non-English speakers (Glenton 2002). Difficulties with understanding health-related information due to language barriers has been studied especially among immigrants (Courtright 2004; Phul et al. 2003). Among the elderly, also problems with memory might influence understanding, as Benson and Forman (2002) showed.

3. Defining health information literacy

The ability to receive and use health-related information has been referred to as *health literacy*, a concept mostly used within health sciences. Pfizer Clear Health Communication Initiative (no date) defined health literacy as "the ability to read, understand, and act on health information". According to the WHO Health Promotion Glossary "health literacy represents the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health" (World Health Organization 1998: 10; Nutbeam 2000: 264). Higher health literacy includes improved knowledge and understanding of health determinants, changes in attitudes and motivations related to health behaviour, and self-efficacy (Nutbeam 2000). Self-efficacy is the belief in your own ability to conduct certain behaviour (Bandura 1986; Rimal 2000).

Within library and information science, the concept of *information literacy* is commonly used (see e.g. Virkus 2003). There are different approaches in the use of this concept, but the one by the American Library Association is perhaps the most spread. Information literacy means the abilities individuals need to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (American Library Association 1989). An information literate person has the ability to: determine the extent of information needed; access the needed information effectively and efficiently; evaluate information and its sources critically; incorporate selected information into one's knowledge base; use information effectively to accomplish a specific purpose, and; understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally (American Library Association 2000: 2-3).

The Medical Library Association in the United States has proposed a new concept, *health information literacy,* and framed it within the two related concepts of information literacy and health literacy. Health information literacy is defined as the abilities to recognize a need for health information, to identify likely information sources and use them to retrieve information, to make quality assessments, and to analyze, understand, and use the information in order to make good health decisions (Medical Library Association 2003). Health information literacy means knowing when health information is needed, how and where to find information about health, and how to evaluate and use this information in everyday life (Medical Library Association 2005).

Since the concept of health information literacy is rather new, it has so far not been much used in research concerning access to and use of health information. The paper aims at addressing this gap and the concept is applied in a general way on entire groups of people, not individuals. The relationship between information, knowledge and behaviour in health matters among groups of people in differing health situations is studied in order to see if there are differences in the levels of health information literacy and, if so, what lies behind the possible differences. Health information literacy is here assessed by choice and use of different information sources, information behaviour (defined as perceptions of need of health-related information and activity to seek and share such information), assessments of quality of health information, attitudes towards health information and healthy lifestyles, self-confidence and -

efficacy, and relations between information sources, health knowledge base, and existing health behaviour.

4. Methods and materials of the current study

The respondents of this study consisted of 50 Finnish citizens, aged 20-42 years. These were 38 women and 12 men, who belonged to one of three different groups: pregnant women (n=18), persons with diabetes (n=17), and persons in a so-called control group (n=15). Diabetics and pregnant women were chosen because they are in a situation, where food plays a certain role for the wellbeing. The control group consisted of persons who were mainly healthy, and was gathered in order to see if a differing health situation was related to health information literacy. The mean age was 29.4 years and the median age 28.5 years. Most respondents had an education at university level, but almost as many had an upper secondary level of education. The study is mainly qualitative, and due to the small sample, the imbalance in gender ratio, the limited age range, and the education level being higher than average, the results show certain tendencies, but they do not in general apply to the wider public.

The subjects were recruited on a voluntary basis through notices and leaflets sent to local maternity care centres, laboratories, diabetes nurses, and the local diabetes association. Notices were also put on discussion forums on the Web sites of childcare magazines, a Web clinic and the Finnish Diabetes Association. In order to gather the control group, a so-called snowball sampling-method (Larsson 2000; Sligo & Jameson 2000) was used; acquaintances were asked to pass the word to their acquaintances, and if these were interested to take part in the study, they were to get in touch with the researcher.

The subjects were all interviewed in person by the author during the first half of the year 2001. The used technique was a structured interview. Information source profiles of the 50 subjects were mapped out on the basis of five questions measuring the use of information. The respondents were, for example, asked to tick those out of 27 given information sources, from which they had obtained information about healthy eating habits, or to assess how reliable they thought the sources to be. In the analysis, the answers of the respondents were transferred into points. The higher the degree of the respondent's perception of the usefulness of information and their attentiveness towards information in a source or trust in the source, the higher the points assigned. The points for each of

the 27 sources were then added up and grouped in one of four levels: low (1), medium-low (2), medium-high (3), and high (4) points. A cluster analysis was made on the respondents, using the FASTCLUS procedure, with the aim of finding groupings of respondents with similar levels of information source points. A cluster analysis strives to group the examined individuals so that the differences between the individuals in one group are as small as possible concerning the examined variables, and as large as possible between the different groups, that is, the clusters (Toivonen 1999: 341). A cluster analysis was also made on an attitude-measuring question containing 30 statements about health information and healthy living, upon which the respondents had to decide. Despite of the small sample, also chi-square analyses were conducted in order to test relationships between variables. The connections were considered significant if $p \leq .05$.

Knowledge level was measured in two parts; first by several detailed knowledge questions, such as statements to be answered by "true" or "false" and multiple choice questions, and second by storytelling of how to live a healthy life. The stories were judged by counting the number of so-called actions (e.g., "eat vegetables", "exercise"), and based on the number of actions, the terminology employed and shown expertise, the stories were judged as being either weak, mediocre/good or excellent.

5. Information source clusters and demographics

The cluster analysis of the information sources revealed three information source clusters. These three clusters will hence be used as a basis for reporting the results. Cluster 1 (n=19) contained a larger percentage of male respondents than the other clusters and the respondents within this cluster consisted mainly of diabetics. A significant relationship was detected between the health status group and information source cluster ($\chi^2=12.57$, $p=.014$). The respondents were also the youngest ones, and the ones with the lowest level of education. The respondents in cluster 1 were almost entirely relying on health professionals as sources of information; they gained the highest mean points, 3.68 out of a possible 4, on doctors or other health professionals, followed by official health information (1.89) and health magazines (1.84), with much lower mean points. Thus, cluster 1 was called *the professionals' cluster*.

Cluster 2, containing 20 persons, was the most female-dominated one, and contained more pregnant women than control group members.

In cluster 2, the main information sources were of the type, which mediate professional scientific information in a popularized form in, for example, magazines specializing on health and wellbeing. Health magazines gained the highest mean points, 3.15, in cluster 2. Newspapers, official health information, television news and doctors/health professionals followed, but the mean scores for these sources were 2.05 at the highest. This cluster was called *the popularized science cluster.*

Cluster 3 contained the oldest respondents, and had the best educated members. Control group members formed the largest health status group within this cluster. The 11 respondents in cluster 3 did not clearly prefer any certain type of information source, but seemed to live largely in an information environment consisting of everyday sources, such as the news media. Television news and newspapers - with 2.27 points each - closely followed by family and friends (2.18), were the primary sources in this cluster; hence it was labeled *the everyday information cluster.*

6. Information behaviour

Differences in information behaviour were found between the persons in the different clusters. The respondents in the popularized science cluster were the most interested in information on health and food and the respondents in the everyday information cluster the least interested; the relationship between little interest and the everyday information cluster was significant (χ^2=11.62, p=.02). The vast majority of the popularized science cluster members also said that they were very active at seeking information, while most everyday information cluster members were only a little or somewhat active in seeking health information.

The persons in the popularized science cluster were also most active at discussing this kind of information with others, while those in the everyday information cluster were fairly uninterested in discussing. The relationship between discussion frequency and source cluster was strong, although not significant (χ^2=14.53, p=.069).

The primary reason for information seeking was general interest, and for some - mainly diabetics and pregnant women - the reasons were problems related to their wellbeing or health, which required the intake of more information. A question aimed solely at the diabetics and the pregnant women, showed that a change in the health situation obviously increased the interest in and need for more information. Nearly 80% of the pregnant women and slightly less of the diabetics answered that this

was the case. Several diabetics could not answer the question, though, claiming that the diagnosis had been made too long ago, or at too young an age.

6. Critical thinking

Concerning abilities to think critically, the professionals' cluster was most critical of information provided by certain information sources; most of the respondents considered some information sources both doubtful and contradictory. The everyday information cluster was the least critical one; only one-third of its members thought that some sources are both doubtful and contradictory.

When seeking health information, those in the professionals' cluster were most often very or somewhat selective, while the members of the popularized science and the everyday information clusters were mainly not selective at all.

Despite of being critical otherwise, the professionals' cluster members were most satisfied with the information they are provided with. Those in the everyday information cluster were, however, the least satisfied. Those who were not satisfied mostly wanted more information, information differing in content or quality guarantees, such as the information being research-based.

7. Confidence towards information and self-efficacy

Cluster analysis conducted on an attitude-measuring question containing 30 statements, also resulted in three clusters of respondents: the confident, the careful, and the distrustful clusters. These clusters were cross-tabulated with the information source clusters. In the confident cluster, the respondents were fairly confident in their ability to manage information and to maintain a healthy life. One-half of the respondents in the popularized science cluster, 40% of those in the professionals' cluster, but only 1/3 of the everyday information cluster members, belonged to this attitude cluster. The careful cluster was to some extent unsure about its capability of managing health information and slightly unsure about healthy living and distrustful of foreign foods. This cluster contained the largest share of everyday information cluster members. The distrustful cluster was most negative and most distrustful of information, globalization and healthy eating; these respondents thought that there is both too

much information and that eating in a healthy way is difficult. Around 20% of respondents in the professionals' cluster and the everyday information cluster, respectively, were found in this attitude cluster. Hence, the persons in the popularized science cluster had the most positive attitude towards health information, while the respondents in the everyday information cluster had an attitude towards health information and healthy living that was more careful than in the other clusters.

Members of the professionals' cluster felt safer than the members of other clusters, as a result of the health information that they receive, while the popularized science cluster members felt least safe. Feeling unsafe was associated with perceptions of insufficient information, distrust, anxiety, or beliefs that the relationship between food and health is not that strong.

The professionals' cluster members seemed to have less confidence in their own knowledge than those of the other clusters. The percentage of respondents thinking that their knowledge about food and health was good or excellent, as well as the share of respondents thinking that their knowledge is enough for their own needs, was smaller than in the other two clusters. The popularized science cluster members were most confident in their existing knowledge and in the belief that the knowledge was sufficient for their own needs, while the respondents in the everyday information cluster showed a somewhat complex confidence in their own knowledge; some were confident, while some also considered their knowledge to be fairly low. Most of them still thought that their existing knowledge was enough for their needs.

The members of the professionals' cluster were, furthermore, least confident in their ability to control their own health and to take care of themselves. The popularized science cluster members were again the most confident. Those in the latter cluster were also most convinced that they take good care of their own health. Also most of the respondents in the everyday information cluster thought that it is possible to control your own health a lot, but less than half actually perceived that they take very good care of their own health.

8. Information sources and knowledge

In the detailed part of the knowledge tests, the professionals' cluster members gained the largest share of low points, of all the clusters. The popularized science cluster, instead, had the smallest percentage of

respondents with low points. Knowledge about food and health was thus best in this cluster.

In the storytelling part, as many as two-thirds of those in the popularized science cluster made a good or fairly good story, and only one-fifth had a weak story, which was much less than in the other clusters. The popularized science cluster members, thus, seemed to have the best knowledge on how to live a healthy life. A significant relationship was found between good general knowledge and use of popularized science sources (χ^2=9.56, p=.048). The storytelling was the weakest in the everyday information cluster, while almost two-thirds told a story judged as weak.

9. Health behaviour

The professionals' cluster members, despite of being mainly diabetics, smoked the most, and a majority also used alcohol, even more often than in the other clusters. The popularized science cluster members, who showed the best knowledge of how to live in a healthy manner, also had the best health behaviour concerning tobacco and alcohol use. This behaviour was, however, also largely due to the health situation, as the cluster had the largest share of pregnant women, and pregnancy was significantly related to non-use of alcohol (χ^2=30.74, p=.001) and tobacco (χ^2=6.29, p=.043). In the everyday information cluster, only one of the respondents smoked, and alcohol use was also quite moderate.

Although the members of the professionals' cluster showed less desired behaviour concerning substance use, they were still somewhat more eager to do physical exercise than those in the other clusters, whereas the popularized science cluster members were slightly less eager to exercise than were those in the other two clusters. In the everyday information cluster nearly all respondents exercised, but most only exercised a few times a week and the time of exercise was often shorter than in the other clusters.

Eating behaviour was most important in the professionals cluster; all but one respondent in the cluster had rules of thumb for eating. Rules of thumb for eating were, on the other hand, least common in the popularized science cluster, only three-quarters of the respondents had such rules. Almost two-thirds of the professionals' cluster members often followed the recommendations they receive on what to eat. The popularized science cluster, although showing a positive attitude towards health information and healthy living, was, together with the everyday information cluster, least interested in following recommendations.

10. Concluding discussion

This study compared the levels of health information literacy of persons living in differing health situations and preferring different types of information sources. Health literacy may be seen as the cognitive ability of an individual to benefit from health-related information (e.g., World Health Organization 1998; Nutbeam 2000). Health information literacy is a concept broader than this, as it also includes the activities surrounding the acquisition of health information (Medical Library Association 2003). In this study, three information source clusters were mapped out. Nearly 40% of the respondents, forming the professionals' cluster, had a narrow information profile and almost entirely relied on information provided by doctors or other health professionals, such as midwives at maternity care centres. In the popularized science cluster, the main source was health-related magazines, while the respondents in the everyday information cluster mainly kept to sources such as the news media and persons in the close environment. Table 1 displays the comparisons of the source clusters concerning their health information literacy.

Table 1: Comparisons of the characteristics in the three information source clusters.

	Professionals' cluster (n=19)	**Popularized science cluster (n=20)**	**Everyday information cluster (n=11)**
Sources and demographics			
1. Demographic characteristics	Largest share of men, youngest, least educated	Largest share of women	Oldest, best educated
2. Source preference	Health professionals	Professional information in a popularized form	Daily news media, informal sources
3. Health status group	Diabetics	More pregnant women than control group members	More control group members than pregnant women

Table continues on next page

Information behaviour	Professionals' cluster (n=19)	Popularized science cluster (n=20)	Everyday information cluster (n=11)
4. Interest in health information	medium high	highest	lowest
5. Seeking activity	medium high	highest	lowest
6. Discussion activity	medium	highest	lowest
Critical thinking			
7. Criticality against some information sources	strongest	medium	weakest
8. Selectivity towards information	highest	medium low	lowest
9. Dissatisfaction with received information	least	medium	most
Confidence towards information and self-efficacy			
10. Confidence in own ability to manage health information and healthy living	medium strong	strongest	medium weak
11. Feeling safe due to new information	strongest	weakest	medium strong
12. Confidence in own existing knowledge	weakest	strongest	medium weak
13. Confidence in knowledge being sufficient	weakest	strongest	medium strong
14. Confidence in the possibility of controlling one's own health	weakest	strongest	medium strong
15. Confidence in taking care of own health	weakest	strongest	medium weak
Information sources and knowledge			
16. Measured detailed knowledge	lowest	highest	medium
17. Knowledge measured by storytelling	medium	highest	lowest
Health behaviour			
18. Non-use of tobacco	least	most	medium much
19. Non-use of alcohol	least	most	medium
20. Exercise activity	highest	lowest	medium
21. Rules of thumb for eating	most	least	medium much
22. Following recommendations on healthy eating	most	least	least

As can be seen in table 1, the popularized science cluster members showed the most active information behaviour, and their confidence and knowledge was the best, as was also their health behaviour on some matters. The respondents in the professionals' cluster were weaker on some factors such as self-confidence and some knowledge and behaviour issues. The persons in the everyday information cluster, however, scored the lowest on information behaviour, critical thinking, and the general knowledge test. On the other parts also, these persons were only mediocre.

There can be several reasons for these differences. One reason for the differences in the preference for certain sources and in information behaviour could be the current health situation or changes in it. According to De Pietro and Clark (1984), the preference for a certain information source is determined mostly by the present health situation and this could be seen also in this study, as most of the respondents in the professionals' cluster had diabetes, while many in the popularized science cluster were pregnant. The popularized science cluster was also most active at seeking health-related information, and to discuss these matters with others, a situation where more information might be acquired. The persons in the everyday information cluster, where most persons had no certain health condition did, on the other hand, not pay any larger interest to any particular source, and did not actively engage in information seeking behaviour.

When a change in health situation occurred, the needs for information also increased. A vast majority of the diabetics and the pregnant women mentioned that diagnosed diabetes and revealed pregnancy had changed the interest in and need for health-related information, and the two clusters containing most of the persons in these situations were also most active at seeking information. This is in accordance with previous research (Hepworth & Harrison 2004; Rees & Bath 2000; Williamson & Manaszewicz 2002).

The professionals' cluster members were most critical towards information and some information sources. Previous studies (de Almeida et al. 1997; Buttriss 1997; Meischke et al. 2002) have shown that health professionals are often considered most reliable and useful. Because of this, they are also quite a natural choice for critical information seekers. The professionals' cluster members did, however, show the lowest self-confidence and –efficacy, and also the lowest levels of detailed knowledge were found among them. Some studies have shown that relying on health pro-

fessionals is combined with less knowledge (Chew et al. 1995; Meissner et al. 1992; Pancioli et al. 1998). This might be associated with problems in the communication between health professionals and patients, such as use of medical terminology, lack of communication skills and an arrogant attitude among the doctors (Glenton 2002; Lyons et al. 2002; Majerovitz et al. 1997). Other problems are due to lack of information (Browne et al. 2000). Especially lack of information was expressed among these respondents.

Those in the professionals' cluster also showed the worst health behaviour concerning substance use, but the best eating behaviour and also good levels of physical exercise. The better eating could be explained by the diabetes, which requires certain focus on the eating, but the question remains, why the diabetes did not limit substance use, like pregnancy did among the pregnant women.

The respondents in the popularized science cluster showed the best knowledge in both tests, used substances the least, and these persons were most self-confident and had the most positive attitude towards health information and healthy living. They were also most active at acquiring new information. They thus seem to be most able to understand and use health information. In the everyday information cluster, the respondents did not show any larger interest in actively seeking and sharing health information and they were not very critical. Their attitude towards health information and healthy living was more careful than in the other clusters, and the self-confidence was mediocre. Also the health behaviour and the measured knowledge were at a medium level and even weak concerning knowledge of healthy living. Health information literate persons have an ability to recognize a need for health information, to use information sources to retrieve information, to make quality assessments, and to understand and use health information (Medical Library Association 2003). Nutbeam (2000) considered higher self-efficacy, together with increased knowledge and better attitude and motivation critical for better health literacy. Thus, it seems that both health literacy and health information literacy are the strongest among those in the popularized science cluster. Those using everyday life information sources, instead, seem to have the weakest level of health information literacy. It is claimed that there is a strong link between literacy and health literacy (Nutbeam 2000; World Health Organization 1998: 10), but as the everyday information cluster contained highly educated persons, weaker health infor-

mation literacy is apparently not strongly related to education level, at least not in this case.

Due to the mainly qualitative nature of this study, any major conclusions cannot be drawn until the method has been applied on a larger population. Even so, tendencies emerged, and the main findings could be worth considering within, for example, health promotion. Relations were suggested between especially the preference for certain information sources, information seeking activity, attitudes towards information and health knowledge and to some extent also health behaviour, or in other words actually health literacy. As popularized science information seemed to be related to the best knowledge level and good behaviour, health-promoting information could be designed in a way similar to this type of information; the form of the source and contents, the used language, and the level of abstraction should be taken into consideration. Since it seems that an active personal information behaviour is critical for better knowledge and health behaviour, information and education should not only be provided to passive receivers, but the receivers themselves should be involved in the acquisition of health information. From a library and information science point of view, enhancing the information literacy skills of the public, helping them to know how and from where to acquire health information that is suitable for themselves and their needs, should be considered, as this could increase health literacy levels, too.

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