

## Refereed paper

# Use of email in communication between the Finnish primary healthcare system and general practitioners

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## ABSTRACT

**Background** The volume of emails is rising rapidly everywhere. However, there is no data available concerning how primary healthcare physicians feel about the use of email communication between themselves, with their managers and with other people contacting them.

**Objective** The objective of this study was to find out what the attitudes of primary care physicians are towards email at work.

**Methods** The use of email was studied among a convenience sample of primary healthcare physicians.

**Results** Physicians thought that email was a good instrument for delivering information but not as an instrument for leadership. Physicians in lead positions thought more often than ordinary general practitioners (GPs) that email is good for information. The leaders used email more actively than other GPs. The contents of the emails received by the GPs differed depending on the site of work. The total number of emails was higher in urban areas than in rural areas. Emails relating to administration, educational information and meeting materials were more often sent in rural than in urban primary healthcare settings. Information about daily work

arrangements and about social events were more frequently emailed in urban than in rural surroundings. Email was considered important for information inside the system but a somewhat difficult tool for discussing complicated subjects. Generally, it was agreed that there was some unimportant information filtering through this medium to the target GPs. GPs were uncertain whether important data reached everybody who needed it or not. Still, almost everybody used the email system regularly and the use of it was considered relatively easy. GPs were generally prone to adopt advice and instructions given via email and implemented those in their working routines. The use of the email system was related to technical ability to use the system. The easier the GP thought that the email system was the more he used it. Rural GPs were more critical in applying advice shared via email than their counterparts in urban areas. In general, physicians thought that email was a good method for reaching many people at the same time. However, the main points of the messages may be missed and the whole email may sometimes not be read.

**Conclusion** Especially during periods of change in the workplace, it is very important that management is conducted personally. Care must be taken so that disinformation does not spoil the informative value of email in the administration of primary health care. The needed technical assistance should

be given to everyone in order to get the best advantage from the use of the email system.

**Keywords:** administration, communication, email, general practitioners, primary health care

## Introduction

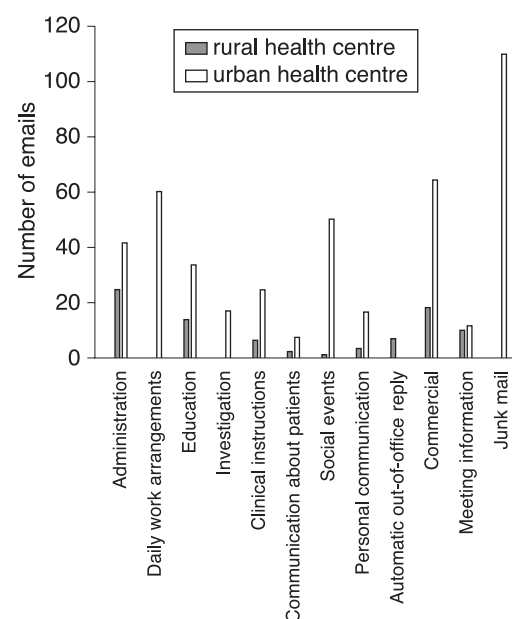
Secure web messaging is an improvement in sharing patient-related information by email because it provides data security, confidentiality and access control.<sup>1,2</sup> Security factors, combined with the possibility to communicate at the most optimal time for the partners and ever increasing access to email,<sup>3</sup> have increased the magnitude of email communication between patients and health systems. These same factors are likely to increase the popularity of email messages within health systems, too. Although there are a number of reports studying the use and quality of email communication between physicians and their patients,<sup>4</sup> and information technology and its implementation in health care has been extensively studied,<sup>5,6</sup> there are few studies describing the use of email in communication between health professionals. Russell *et al*<sup>7</sup> described the use of loose, informal email-mediated networks providing ideas based on evidence-based medicine (EBM) for primary healthcare practitioners, but this work is merely descriptive. Yet being able to communicate properly is considered one of the most important clinical leadership and management skills in medicine.<sup>8,9</sup> Therefore the lack of scientific activity in studying widely used email communication inside healthcare organisations is surprising. There seem to be no data available about how primary healthcare physicians feel about the use of email communication between themselves, with management and with other parts of the health system when information concerning the data of individual patients is excluded. Because email communication seems to be an important method for physicians to communicate with management, we wanted to study their attitudes towards email.

To make an exploratory study, we gathered emails received by two of the authors during one month. By using a questionnaire to physicians attending either one of two meetings held for other purposes we attempted to get some idea of the attitudes of GPs towards the use of email in communication inside their present workplaces. We also tried to compare the attitudes of different groups of GPs towards the use of email for communication. We compared the answers of physicians operating in rural or urban locations, who were or were not in the lead positions and, finally,

who had received their medical education in Finland or elsewhere. To further clarify the nature of the attitudes towards email communication, a strengths, weaknesses, opportunities and threats (SWOT) analysis on the use of email inside their organisations was performed by the present study population of GPs.

## Method

To start our exploratory study, two of the authors, both GPs, gathered all the emails they received during one month (between 17 October and 16 November 2006) and those emails were divided into different categories by content (Figure 1 and Table 1). We categorised them on an iterative basis until agreement was achieved between the researchers. During another month (September 2008), the same physicians counted their email messages and looked at how many times they received the same information twice from different sources.



**Figure 1** Total numbers of emails in rural and urban health centres

**Table 1** Topics of emails in rural and urban health centres

Subject	Description	Rural health centre (%)	Urban health centre (%)	All (%)
Administration	Administrative orders and discussions about them	31.3	9.8	13.2
Daily work arrangements	Changing work shifts and information about holidays and work-related phone numbers	0.0	14.0	11.8
Education	Information, registration, cancelling, assessment, material and arrangements of educational events and educational newsletters	17.5	7.9	9.4
Investigation	Conversations about scientific work and publications	0.0	3.8	3.2
Clinical instructions	Guidelines for different clinical situations	6.3	6.0	6.0
Communication about patients	Asking advice from a colleague and agreeing on how to handle different situations	2.5	1.4	1.6
Social events	Information and registration for parties and games with colleagues and information about the medical association and the choir	1.3	11.2	9.6
Personal communication	Conversations about second jobs and hobbies	3.8	3.3	3.4
Commercial	Includes making appointments with sales representatives for different drugs, different advertisements, information about new medications and different marketing questionnaires	21.3	14.8	15.8
Automatic out-of-office reply		6.3	0.0	1.0
Meeting information	Agreeing dates for meetings	10.0	2.4	3.6
Junk mail		0.0	25.5	21.4

The emails were categorised as follows:

- administration, including administrative orders and discussions about them
- working arrangements, including changes to work shifts and information about holidays and phone numbers
- education, including information, registration, cancelling, assessment, material and arrangements for educational events and educational newsletters
- investigation, including conversations about scientific work and publications
- clinical information, including guidelines for different situations
- communication about a patient, including asking advice from a colleague and agreeing on how to handle different situations
- social events, including information and registration for parties and games with colleagues and information about the medical association and the choir
- personal information, including conversations about second jobs and hobbies

- commercial, including making appointments with sales representatives for different drugs, different advertisements, commercial information about new medications and different questionnaires
- meeting information, including agreeing dates for meetings.

We collected a convenience sample consisting of 53 GPs of whom ten were located in a rural area (Southern Karelia) and 43 in an urban area (in the capital). Ten of the GPs were in lead positions. Fifteen of the GPs had received their basic medical education elsewhere than in Finland, ten of those in parts of the former USSR. Both open and structured research methods were used to enable the GPs to reveal their opinions about using email for communication inside their work organisations.

First, as a structured method, a questionnaire (Figure 2) was delivered and answered during doctors' meetings. The answers to the questionnaire were

decoded and further analysed by using the  $\chi^2$ -test, Mann–Whitney Rank Sum test and Kruskal–Wallis One-Way Analysis of Variance on Ranks, followed by the Dunn post hoc test when necessary. Spearman correlation coefficients were counted between critical postulations.

Second, we performed a traditional SWOT analysis by asking the GPs what kind of strengths, weaknesses, opportunities and threats they found in the use of email inside their primary healthcare organisations. The method was open since the GPs were able to formulate the answers freely by writing. The most commonly given answers were then presented as direct distributions. The SWOT analysis was performed in a single meeting, during which a table was completed by the GPs. The five most named factors in the SWOT analysis categories were presented as results in the analysis. Statements giving the same idea in different words were combined.

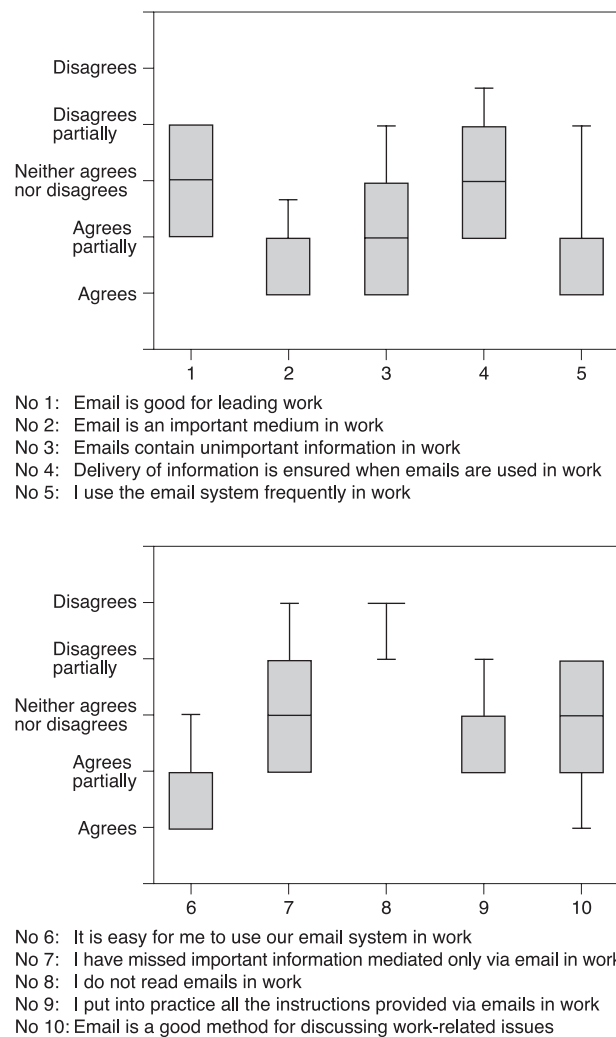


Figure 2 Answers to postulations

## Results

In the present sample of emails, the contents of the emails received by the GPs differed depending on the location of the workplace. First, the total number of emails was clearly higher in the urban area ( $n=420$  vs  $80$ ). Emails concerning administration, educational information and meeting materials were more often sent in rural than in urban primary health care ( $P<0.05$ ,  $\chi^2$ -test). There was also a clear overrepresentation of junk mail ( $107$  vs  $0$ ) in the urban area when compared with the rural area (Figure 1). Information about daily work arrangements and social events was also more frequently emailed in urban than in rural surroundings ( $P<0.05$ ,  $\chi^2$ -test). The proportion of administrative messages and messages containing meeting information was greater in the rural email messaging, while the proportion of social messages and messages concerning daily work arrangements was higher in the urban area (Table 1). Duplicated messages proved to be rare in both systems ( $0.5\%$  in the rural area and  $0.7\%$  in the urban area).

Generally, the opinions of GPs in the present sample varied greatly when considering email as a tool for leading healthy system activities (see postulation 1 in Figure 2). Email was considered an important tool in disseminating information inside the system (see postulation 2 in Figure 2) but a somewhat problematic tool for discussing various subjects (statement 10 in Figure 2). Generally, it was agreed that there was some unimportant information filtering through this media to the target GPs (statement 3 in Figure 2). GPs were uncertain whether the important data reached the whole system or not (statement 4 in Figure 2). Still, almost everybody used the email system regularly (statement 5 in Figure 2) and the use of the email system was considered relatively easy (statement 6 in Figure 2). Therefore, almost no-one reported that they did not read the emails they received (statement 8 in Figure 2). There was uncertainty about whether some important information reached GPs or not (statement 7 in Figure 2). Yet GPs were generally inclined to adopt the advice and instructions given via email and to implement these in their working routines (statement 9 in Figure 2).

Emails were regarded by GPs as good for sharing information but not so good as a tool of leadership ( $P<0.001$ , U-test). The physicians in lead positions thought more often than other GPs that email is good for mediating information ( $P=0.026$ ). The leaders used email more actively than other GPs ( $P=0.026$ ). The use of the email system was related to technical ability to use the system. The easier the GP thought that the email system was the more he used it ( $r=0.504$ , Spearman rank order correlation coefficient,  $P<0.001$ ).

It seems that those GPs who thought that email was a useful tool for leading work activities did not apply the contents of the messages more eagerly than those who did not believe in the usefulness of emails for this purpose ( $r=0.21$ , Spearman rank order correlation coefficient). However, the more the GPs thought that email was a good method for sharing information related to work, the more eager they were to apply the contents of the messages to their way of working ( $r=0.289$ ,  $P=0.034$ ). The more the GPs believed that email is a useful method of disseminating work-related information, the more they also believed in it as a useful tool for leading activities ( $r=0.387$ ,  $P=0.004$ ).

Whether the GPs considered there to be more or less unnecessary information in mediated emails failed to correlate with the estimated importance of emails as tools for mediating information ( $r=0.16$ ). However, those who mostly believed that there was unnecessary data in the email-mediated messages also believed the most strongly that the dissemination of essential information was not secured by this method ( $r=-0.443$ ,  $P=0.001$ ). They also felt more strongly than those who thought that there was little or no unnecessary data on emails that they had missed important information ( $r=0.322$ ,  $P=0.019$ ).

In the present sample, those physicians who had studied in Finland used email more actively than those who had studied abroad ( $P=0.005$ , U-test). The doctors with a Finnish educational background also had more working years than those educated abroad ( $P=0.011$ , U-test) and they more often thought that there was unnecessary information in emails ( $P=0.020$ , U-test). All physicians who received their basic medical education in Finland said that they read their emails, unlike those who had received their basic medical education abroad ( $P=0.019$ , U-test). Physicians whose basic medical education was obtained in Finland thought more often than those whose education was obtained abroad that many of the emails they received did not have high priority ( $P=0.020$ , U-test).

Rural GPs were more critical about implementing the advice mediated via email than their counterparts in the urban area ( $P=0.01$ , U-test). Analogously, those GPs whose basic education was obtained abroad, but not in the former USSR, were critical about implementing email-mediated advice ( $P=0.017$ , Kruskal-Wallis ANOVA).

We received 31 answers out of a possible 51 to the SWOT analysis. The most frequently reported answers were recorded (see Box 1).

**Box 1** SWOT analysis

## Strengths and opportunities

- ability to reach several people at the same time ( $n=23$ )
- fast media to reach people ( $n=17$ )
- ability to use at convenient time ( $n=10$ )
- easy to use ( $n=9$ )

## Weaknesses and threats

- too much information to be read, and therefore possibility that the main point may be missed ( $n=28$ )
- impersonal tool for communication ( $n=12$ )
- doubts concerning data security and viruses ( $n=7$ )
- the excess of junk mail ( $n=6$ )

## Discussion

### Contents of the emails

In the present study, the amount of junk mail received was less in the rural than in the urban location. In the urban location the total percentage of junk mail was as high as 21.4% of the total number of received emails. Naturally, one reason for these differences is the use of different junk mail filters. There are no reports concerning the amount of received junk mail in primary health care. Nevertheless, large amounts of junk mail might, in the present study, have made it difficult for GPs to find adequate administrative information needed for working in the urban setting. Actually, in the SWOT analysis GPs mentioned that important information is prone to be overlooked if there is too much data in the emails. Furthermore, those who mostly believed that there was unnecessary data in the email-mediated messages believed the most strongly that the dissemination of essential information was not secured by this method. Therefore, administrators should take care that junk mail filters in email systems are appropriate.

In other aspects, the numbers of different types of monthly emails were relatively equal in both locations. Some slight differences existed. Administration, educational information and meeting materials were more often sent via emails in rural than in urban primary healthcare services. Information about daily work arrangements and about social events were also more frequently emailed in urban than in rural workplaces. This might, however, have been due to the fact that the numbers of doctors and other personnel in the urban email system were higher than the corresponding numbers of personnel in the rural

system. Therefore, the diversity of the topics under discussion might have been larger in urban than in rural workplaces. Furthermore, due to the fact that only two doctors collected these emails our sample was quite limited. Elsewhere in primary health care, emails are used as a research method,<sup>10</sup> as a method of creating networks of clinicians and healthcare professionals<sup>7</sup> and as a method of communicating directly with patients<sup>11,12</sup> and about patients between different health organisations.<sup>13</sup>

Numbers of emails concerning patients and their attempts to contact their doctors via email were sparse. Although emails are considered easy to use, patients and doctors seemed not to be used to addressing clinical matters with this communication system. In an American survey, approximately 5.5% of the doctors used email as a system to contact their patients.<sup>11</sup> Primary healthcare doctors in particular have been reported as being conservative in using email communication and the proportion of emails from their patients has been reported to be less than 3%.<sup>12</sup> Analogously, in New Zealand only 4% of GPs used email in communicating with their patients.<sup>14</sup> Yet a considerable amount of email-related literature concerns the use of this method as a tool for communication between doctors and patients.<sup>11,12</sup> Owing to increasing access to email systems, patients will be likely to create increased pressure towards the use of emails in dealing with their problems in primary health care, too. Therefore, medical systems should have some strategy for how to respond to probable demands for increased use of email in patient contacts. These considerations should be tactical (how to apply adequate time and personnel resources for this communication) and technical (how to ensure confidentiality and access for patients and GPs in all circumstances). Nevertheless, the number of administrative emails overwhelmed the number of individual patient-related emails in the material presently being considered.

### Comparisons of use of emails between different groups

It seems that basic education may have an influence on the use of emails in the workplace. Those who received their basic education in the Finnish system seemed to be more familiar with using email systems than those who had received their basic education elsewhere. Moreover, it has recently been shown that there are differences in capability regarding the use of data and research information depending on the country in which a medical doctor has graduated.<sup>15</sup> Of course language may have been one interfering factor which explains the observed phenomena. However, we know that in the Finnish system students get very familiar with messaging via computerised systems while this is not

necessarily the situation with those trained abroad, and in the SWOT analysis the use of the email system was considered easy. However, the easier the GP thought that the email system was, the more he used it, and therefore we suppose that unfamiliarity with the email system might rather have explained why it was more common for those who were educated abroad to skip reading emails. It is, however, worth noting that the Finnish language is used only in a small area of the world and is not very easy to learn. This may affect attitudes towards emails written in Finnish.

The physicians in lead positions thought more often than the other GPs that email is good for mediating information and the GPs in lead positions used email more actively than other GPs. Yet GPs regarded the use of email as better for mediating information than as a tool of leadership. In particular, rural GPs expressed their scepticism in applying advice mediated via email. In this matter there seems to be some discrepancy in the attitudes of those who lead in primary health care and those who are led. One way that could possibly abolish these discrepancies would be to establish a more organised model to deliver administrative information via emails. According to the SWOT analysis, the use of supportive personal contact might help, too.

### General attitudes towards use of email at work (SWOT analysis)

In the material gathered, physicians saw many possibilities for the use of email in their work. In particular, the ability to reach several people simultaneously in a short time period was considered an important advantage. The GPs appreciated the possibility of processing the messages at convenient times. These advantages had already been described in the literature concerning the use of emails between patients and doctors.<sup>3</sup>

However, many of the GPs were concerned that email had replaced personal communication in administration. As was shown in this study, GPs do not consider email for administrative actions to be as important as their leaders do. Especially during changes at work, it is very important that management and leadership are performed personally in the workplace. A possible explanation could be that GPs experience a heavy workload and they may find themselves painted as gatekeepers, standing between their patients and care, rather than being able to serve their patients as gateways to appropriate care.<sup>16</sup> This kind of work demands special support from leadership and this support can rarely be given by email. Also, the changes demanded in working practices should be comprehensively discussed so that all steps in the healthcare process are analysed and the demanded changes really

give new value to the treatment of patients. Brimhall *et al*<sup>9</sup> have recently shown that pathologists value ability to communicate properly as a leadership and management skill. There seems to be a need in health care for physicians' time and effort to be devoted to administration and leadership.<sup>9</sup> Thus personal communication will continue to be important in the future and emails do not seem to offer a suitable alternative means of communication in all cases.

Another reason explaining why email communication in this work was not highly appreciated among the GPs may be related to the limited time resources allocated to reading and answering emails during working hours. When patient records in Finnish primary health care are already of unsatisfactory quality and do not satisfactorily meet the requirements of the legislation,<sup>17</sup> and while patient records are being further developed towards a patient-centered system, the time required for using all these electronic systems is likely to substantially increase.

GPs involved in this study were also concerned about data security and computer viruses. Email consultations have the potential to play an important role in the delivery of preventive health care and in self-management of chronic disorders.<sup>5</sup> Yet in relation to these activities security matters and related education have to be taken care of. However, general attitudes in primary health care may be the main reason inhibiting the wider use of emails in day-to-day work. It has recently been shown that the majority of physicians working in Finnish student health services have a positive attitude towards using email for patient communication.<sup>18</sup> Yet reasons for failures in developing information systems in health care are often found in human-related, social and organisational aspects rather than in technical resources and equipment.<sup>19</sup>

In the present study, the small sample size and use of the convenience sample reduce the ability to generalise the results. Studies on a larger scale are needed to describe more clearly the present situation in the use of emails in primary health care. However, the present study gives some preliminary information to generate discussion of this topic. This topic is relevant to the future administration of primary health care but has been sparsely studied until now.

### Conclusions

Emails are considered useful in disseminating information in primary health care. Care must be taken so that disinformation does not spoil the informative value of emails in the administration of primary health care. General physicians' leaders are challenged to personally communicate with staff, while information

about meeting times and other small things can easily be given by email. The necessary technical assistance should be given to everyone in order to get best advantage from the use of email systems.

#### ACKNOWLEDGEMENTS

This study has been supported by the Vyborg Tuberculosis Foundation.

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#### CONFLICTS OF INTEREST

None.

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Accepted June 2011