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Use and misuse of instant messaging in clinical data sharing: the EHRA-SMS survey

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Instant messaging (IM) enables medical professionals to quickly share clinical data to their peers for counselling. Purpose of this survey is to assess the habits related to IM, their application in clinical practice and the perceived pros and cons. An online survey was distributed to the medical community via newsletters, Twitter, LinkedIn, and Facebook. The survey consisted of 22 questions made on an individual-basis and collected anonymously on SurveyMonkey. A total of 287 subjects from 33 countries responded to the survey (mean age 43 years, 74.8% male). Of all respondents, 88.3% routinely send and 90.3% receive clinical data through IM which was second only to face-to-face contact as the preferred method for sharing clinical data. Twelve-lead electrocardiograms (88.6%), medical history (61.4%), and echo loops (55.7%) were the data shared most often. Nearly half of the clinical data that are sent (43%) or received (44%) are not anonymized. In the same way, 29.3% of the respondents were not aware of the European General Data Protection Regulation (GDPR) at the time of the survey. IM apps are used by medical professionals worldwide to share and discuss clinical data and are preferred to many other methods of data sharing, being second only to face-to-face contact. IM are often used to share many different types of clinical data, being perceived as a fast and easy way of communication. Medical professionals should be aware of the appropriate use of IM to prevent legal and privacy issues.

Keywords Data protection • Data sharing • Digital communication • Healthcare communication • Instant messaging • Patient care • EHRA survey

Introduction

Instant communication and exchange of patient data are important in daily clinical practice.[1] Several instant messaging (IM) platforms have been introduced and are widely used to provide fast and widespread communication. These platforms are mainly app-based and enable physicians to quickly share and send clinical data to their peers, to send information to their patients regarding their illnesses and to be reached for counselling and advise.[2] For scientific and professional exchange, Twitter emerged as the most widely used communication channel among physicians and scientists.[3]

In 2016, the General Data Protection Regulation (EU) 2016/679 (GDPR) regulated data protection and privacy in the European Union (EU) and the European Economic Area (EEA).[4] Despite General Data Protection Regulation regulates sharing of sensitive data over social media and messaging systems, both are currently widely used by physicians to communicate with peers and patients. It remains unclear how IM is currently used in clinical daily practice.

The aim of the present European Heart Rhythm Association (EHRA) survey was to characterize and describe the habits of contemporary cardiologists and physicians related to modern communication tools, their primary and secondary uses in clinical practice and the perceived advantages and disadvantages. Another important part of this work is the assessment of compliance with confidentiality rules, in the setting of IM.

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Methods

An online questionnaire was prepared by members of the EHRA e-Communication and the Scientific Initiative Committees and distributed to the medical community via Twitter, LinkedIn, and Facebook between the 30 November 2020 and the 4 January 2021. The questions were made on an individual-basis and collected anonymously via SurveyMonkey. Physicians from all type of medical specialties were invited to participate. The survey consisted of 22 questions in three blocks (see Supplementary material online):

- The first block consisted of seven questions regarding personal information including age, gender, working environment, working position, and experience.
- The topic of the second block (11 questions) was about the use of IM, asking the physician if she/he was using IM, which app, frequency of use, anonymization of data, type of data shared, pros and cons about IM.
- The last four questions were related to regulations and protection of data.

Statistical analysis

Continuous variables were expressed as mean and standard deviation and categorical variables were presented as numbers and percentages. Comparisons between groups were performed using Student's *t*-tests or Mann–Whitney *U* tests for continuous variables as appropriate, and Chi-square test for categorical variables. Statistical analysis was performed using SPSS 25.0 for Windows (SPSS Inc., Chicago, IL, USA), and R (R Foundation for Statistical Computing, Vienna, Austria). Values of $P < 0.05$ (two-tailed) were considered as statistically significant.

Table 1 General characteristics of the responders of the EHRA_SMS survey

Main work environment	
University Hospital	47.2%
Specialized public hospital	25.2%
District/community hospital	8.3%
Private hospital	9.4%
Private practice	7.1%
Public out-of-hospital clinic	1.6%
Other	1.2%
Current working position	
Head of staff	16.9%
Consultant	48.0%
Fellow	20.5%
General practitioner	8.3%
Nurse	1.2%
Other	5.1%
Main specialty	
Cardiology/electrophysiology	58.3%
Cardiology/general	16.1%
Cardiology/invasive	7.5%
Cardiology/imaging	5.1%
Cardiology/heart failure	2.0%
Cardiology/intensive cardiac care	1.2%
Internal medicine	2.8%
Acute care	0.4%
Other	6.7%

Results

A total of 281 respondents from 33 countries (74.8% male, age 43 ± 11 years old) completed the survey. Characteristics of the responders are shown in *Table 1*.

The majority (88.3%) of the survey participants declared to routinely send and 90.3% to routinely receive clinical data through IM apps. Clinical data are mostly often shared with cardiologists and fellows from the same department (79.4% and 60.1% respectively), cardiologists from other institutions (63.6%), and colleagues of other specialties from the same institution (42.5%). More than half of the respondents (54.4%) also use IM apps to share and discuss clinical data with their patients. Most of the respondents declared using IM to share clinical data at least once a week (36.0%), at least once a day (22.4%) or even more than once a day (17.5%). The frequency of IM use for professional purposes was consistent across different age decades and working position strata (all $P > 0.05$).

The mostly used app to share clinical data were WhatsApp (79.4%), followed by SMS (21.5%), Siilo (14.5%), Telegram (7.9%), Facebook messenger (7.9%), and Microsoft Teams (6.1%). Of note, 53.1% of respondents listed e-mails as a form of IM communication. Similar results were noted when the participants were stratified by age and working position (all $P > 0.05$).

Regarding the preferred method to discuss clinical data (*Figure 1*), IM apps came second (mean Likert scale 3.69) only to face-to-face contact (4.46) and were considered better than phone calls (3.34), e-mails (3.21), and video calls (2.86).

Figure 2 details what kind of data are routinely shared through IM apps. It is noteworthy that the top three most shared data have different files type: 12-lead electrocardiograms (ECGs) (88.6%) are shared as (.jpg) files, medical history (61.4%) are shared as text, and echocardiography loops (55.7%) are shared as video (.mp4) files, underlying the versatility of IM.

Figure 3 shows the perceived advantages and drawbacks in using IM apps to share clinical data. On average, the respondents indicated four different advantages and only two drawbacks. It is interesting to underline the fact that the 'time consuming' and 'gratuity' aspects of IM are the two least voted drawbacks of IM.

Some 29.3% of our respondents declared to be not aware of the General Data Protection Regulation on data protection and privacy in the EU at the time of the survey. This is also reflected by the low volume of clinical data that are shared (57%) or received (56%) after being anonymized. Moreover, only 23.6% of the respondents declared that their institution endorses specific policies or regulations in terms of IM use, while 46.7% claimed that there were no such policies and 29.8% were not aware. Only 17.3% declared that their institution provides them with a legally approved IM service for professional use.

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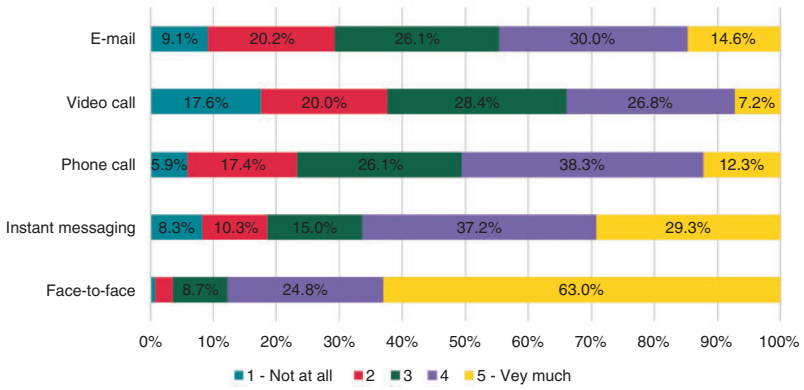

Figure 1 Preference ratings for each single method to share and discuss clinical data. Ratings ranged from 1 (not liked at all) to 5 (very much liked).

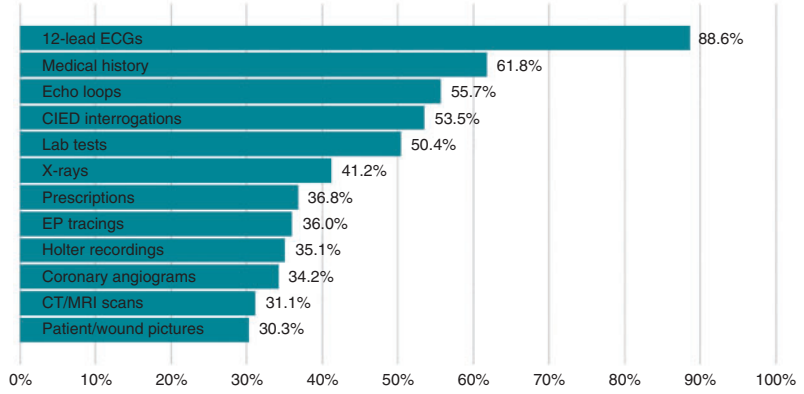

Figure 2 Types of clinical data shared through instant messaging apps.

Discussion

The main findings of the EHRA-SMS survey are: (i) widespread acceptance of novel (non-'face to face') communication technology among physicians; (ii) regular routine use of smartphone-based IM systems; (iii) frequent exchange of different types of data files (movies, photos, and videos) with experts from same or different specialties; and (iv) lack of data protection and privacy considerations by health professionals.

Exchange of medical information between different experts in the field and medical subspecialties has been of major importance, aiming at improving diagnosis, therapy planning and adequate patient management. Traditionally, physicians have met in person to discuss 'face to face' patient scenarios and findings. Interestingly, this has remained the preferred communication scenario despite of the COVID pandemic, according to this survey (*Figure 1*). However, this process can be time-consuming and key data such as angiograms, echo loops or complex electrograms cannot be discussed in real time. In contrast, due to recent impressive smartphone developments, IM apps are progressively utilized also for medical purposes enabling direct, rapid, and low effort data sharing without technical compatibility restrictions. Therefore, fast, direct interaction and availability of different experts may allow for improved patient care. This important development has been captured in the EHRA-SMS survey. Importantly, most participants are young (mean age 43 years), thus emphasizing the growing importance of digital communication skills for health care providers, physicians, and cardiologists. Interestingly, the leading medical information shared via IM has been the 12-lead ECG (88.6%). Despite lacking details, it appears reasonable that typically younger physicians in an emergency room or chest pain unit setting may want to discuss the 12-lead ECG with the consultant on-call without delay. On the other hand, technically more sophisticated data such as cardiac implantable electronic devices interrogations (53.5%), eletrophysiological tracings (36%), or coronary angiograms (34.2%) are shared less often, probably indicating a different motivation in seeking advice.

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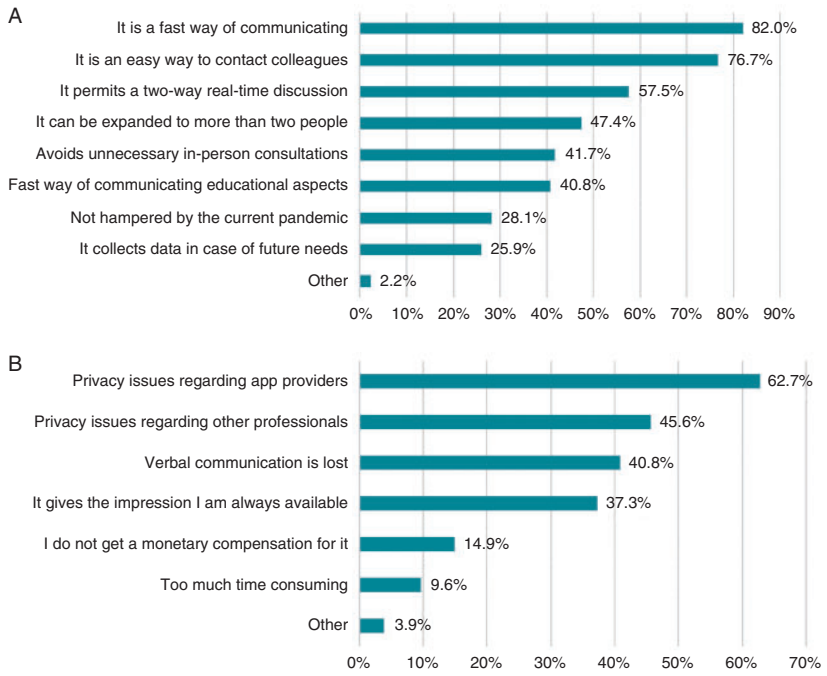

Figure 3 Perceived advantages (*A*) and drawbacks (*B*) of instant messaging in sharing clinical data.

Future roles of instant messaging in cardiology

IM-based medical data sharing between health professionals is now part of the routine, with approximately nine out of ten responders sending and receiving clinical data through IM. It appears foreseeable that specific scenarios could evolve in the near future such as 'virtual heart teams' (non 'face to face' physician discussions including echo loops, angiograms, and more) and extended networks of physicians, which could include all the referring physicians, allied professionals and different institutions.[5] IM also goes hand to hand with remote monitoring, which will increase our capability to gather and share clinical data in the near future.

Additionally, IM groups can create forums for education (e.g. journal club, clinical rounds) without aiming to completely replace face-to-face teaching.[6,7] Moderation and quality assessment of such forums are important aspects that need to be tackled soon.

Data safety concerns

Despite the striking advantages associated with IM in clinical practice, multiple concerns cannot be denied. Of note, up to 29.3% of the respondents were not aware of General Data Protection Regulation on data protection and privacy in the EU and only 23.6% declare that their institution enforces specific regulation regard to the use of IM for professional purposes. Legal consequences of data sharing and storage are unclear. Interestingly, already 17.3% of participants declared that their work institution provides a legally approved IM service. Therefore, improved education and awareness regarding GDPR is utmost critical. In addition, EU wide availability of refined medical messengers (data and legal safe) or individually approved institutional networks is desired. The EHRA Scientific Initiative Committees will think about taking action to change this situation, in order to raise physicians' awareness on the potential ethical and legal issues.

Limitations

The presented EHRA-SMS survey has been distributed through various digital channels. Therefore, a technology friendly selection bias cannot be excluded. In addition, there was no country-specific cap, and all answered have been counted leading to potential country-specific disbalances.

Conclusions

IM is routinely used by medical professionals worldwide to share and discuss clinical data and is often used to share many different types of clinical data, being perceived as a fast and easy way of communication. Nearly half of the clinical data that are sent (43%) or received (44%) are not anonymized. Medical professionals should be aware of the appropriate use of IM in accordance to GDPR in order to prevent legal and privacy issues.

Supplementary material

Supplementary material is available at *Europace* online.

Conflict of interest: All authors declare they have no conflicts of interest related to the present study.

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