

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

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**Factors affecting engagement of primary health care professionals and their patients in facilitated access to online alcohol screening and brief intervention**

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

Author affiliations

1 GRAC. Addictions Unit. Department of Psychiatry, Clinical Institute of Neuroscience, Hospital Clínic. Fundació Clínic Recerca Biomèdica (FCRB), RETICS (Red de Trastornos adictivos), University of Barcelona. Villarroel 170, 08026, Barcelona, Spain. [hlopez@clinic.cat](mailto:hlopez@clinic.cat); [pbarrio@clinic.cat](mailto:pbarrio@clinic.cat)

2 GRAC. Addictions Unit. Department of Psychiatry, Clinical Institute of Neuroscience, Hospital Clínic. Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS), RETICS (Red de Trastornos Adictivos), University of Barcelona. Villarroel 170, 08026, Barcelona, Spain. [miquel@clinic.cat](mailto:miquel@clinic.cat); [tgual@clinic.cat](mailto:tgual@clinic.cat)

3 Department of Primary Care and Population Health, University College London, Rowland Hill Street, London NW3 2PF London, UK [paul.wallace@nihr.ac.uk](mailto:paul.wallace@nihr.ac.uk)

4 Program on Substance Abuse, Public Health Agency of Catalonia, Department of Health, Government of Catalonia, Roc Boronat 81-95, 08005, Barcelona, Spain [lidia.segura@gencat.cat](mailto:lidia.segura@gencat.cat); [joan.colom@gencat.cat](mailto:joan.colom@gencat.cat)

List of members of EFAR group: Iris Alarcón, Judit Alsina, Almudena Álvarez, Carme Anglada, Juan Arenas, Josep Aubà, Francisco Ávila, Marta Beltran, Andrea Carolina Berengué, Mireia Bernat, Olga Bohera, Esther Boix, Cristina Bonaventura, Esther Bracero, Clara Calvó, Elena Campanera, Xavier Cantano, Gemma Capdevila, Elena Casajuana, Eva Casajuana, Clàudia Cardoner, Gemma Comas, Judit Castillo, Carme Codorniu, M<sup>a</sup> de la Serra Comas, Carme Comino, Francisco Cortés, Silvia Crivillé, Carme Danta, José Doz, Eulàlia Duran, Montserrat Delgado, Silvia Duran, Montserrat Espuga, Beatriz Fernández, Maite Fernández, Fernando Ferrer, Meritxell Ferrer, Rosaura Figueras, Pilar Flores, Rosa Freixedas, Teresa Font, M. Carmen Gómez, Milagros González, Ángel García, Carmen García, Elisenda García, Núria García, Josep Maria Gifre, Alicia Gómez, Rosa Maria González, Marta Gamiz, Mònica Ibañez, Joana Hernández, Antonia Leiva, Cristina Ligeró, Josep Ramón López, M<sup>a</sup> Isabel López, Remedios López, Elena Mañes, M<sup>a</sup> Carmen Martí, Sonia Martínez, M<sup>a</sup> Isabel Matilla, Montserrat

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Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

Melé, Cleofé Mellado, Montse Méndez, Juan Mendive, Mònica Mestres, Remei Miralles, Pau Montoya, Ana Morillo, Rosa Blanca Muñoz, Marta Mas, Iria Muiño, Elena Navarro, Olga Navarro, Montserrat Navarro, Clara Oliveras, Siliva Olasololo, M<sup>a</sup> Carmen Parareda, Rosa Pla, Jaume Poch, Núria Plana, Marta Poch, Elvira Pou, Vanesa Robledo, Josefina Rosanas, Breda Riesgo, María Ágnes Sebastian, Cristina Serra, Eva Ramírez, Glòria Ribas, Mercè Ribot, Natàlia Sabat, M<sup>a</sup> Carmen Sánchez, Maria del Mar Sánchez, Anna Santeugini, Teresa Sayrol, Marta Solé, Pere Sors, Susana Sostres, Rosa Torres, Araceli Torrubia, Roser Uрпи nas, Davinia Vázquez, Núria Vidal, Angels Vicente, Manel Vila, Renée Vink, Maria de las Nieves Vizcay, Nora Yanovzky, Dolors Ylla

Corresponding author: Hugo López-Pelayo. Address: Hospital Clínic de Barcelona, Carrer Villarroel 170, escalera 9 planta 6, 08026, Barcelona. Telephone number: +34932275400 ext 4210 Fax number: +34932271750. E-mail: hlopez@clinic.cat

## **Abstract**

**Objective:** Understanding the impact of Level of Information and Communication Technology Use, computer self-efficacy and perceived product usability of healthcare professionals regarding an alcohol consumption reduction website on facilitated access defined as referring patients to the webpage.

**Methods:** 52 nurses and 41 general practitioners were assessed before patient recruitment started, using a questionnaire designed to assess socio-demographic characteristics, professional engagement to the website, Level of Information and Communication Technology Use, Computer self-efficacy (“the judgment of one’s capability to use a computer”) and Perceived product usability (“the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use”). Dependent variable was the self-report of number of brochures distributed to patients.

**Results:** Professionals’ engagement with facilitated access measured by brochures handed out was not predicted by Perceived product usability, Level of Information and Communication Technology Use or Computer self-efficacy. Professionals who had actively engaged with the website (customization) provided significantly more brochures compared with those who had not (Coefficient B 15.7 CI95% 3.5 to 27.8). Professional’s socio-demographic characteristics did not predict engagement in facilitated access.

**Conclusion:** Professionals’ Perceived product usability, Level of Information and Communication Technology Use and Computer self-efficacy were not associated to facilitated access. Active early engagement of health professionals with the website (customization) is a key predictor of subsequent engagement with facilitated access.

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

**Practice implications:** Computer Self-Efficacy, Level of Information and Communication Technology

Use and Perceived Product Usability are irrelevant for facilitated access and efforts should be focused on taking time to collaborate with providers and convincing them about the usefulness of the intervention (including customization). Website customization by health care professionals is a promising predictor of engagement.

**Keywords:** alcohol, computer, hazardous, computer self-efficacy, usability, customization

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## 1. Introduction

Alcohol consumption is a risk factor for more than 200 health conditions [1]. Alcohol related harm increases in a dose-dependent manner, and thus reduction of alcohol intake is beneficial for health [2]. Although alcohol screening and brief intervention (SBI) has been demonstrated to be an effective and cost-effective strategy to reduce risky alcohol use in primary health care[3–5], implementation rates are low (<10%)[5]. Main barriers to implementing SBI in primary health care are lack of time, lack of incentives and risk of upsetting patients[6]. Digital brief interventions (E-BI) have the potential to reduce time in medical consultations and to allow more confidentiality, thus addressing two of these barriers[7]. Primary Healthcare Professionals (PHCPs) in their regular consultation have access to patients who do not spontaneously seek treatment for alcohol related problems. Several meta-analyses support the effectiveness of digital brief interventions for risky drinkers in college students and in general population[8,9]. In the majority of these trials, participants accessed the online treatment independently of their health care professionals, and are likely to represent an already motivated population to reduce drinking. In order to broaden access to e-BI, it has been proposed that primary healthcare professionals actively encourage website engagement of their patients in a process termed facilitated access [10]. There is growing experience of this approach in both primary health care and mental health settings and evidence that it is effective at 6-month follow-up [11,12]) . To date, only one study has specifically explored the impact of provision of facilitated access to e-BI on implementation of brief intervention relative to other strategies (e.g. training and support, financial incentives)[7] and found that facilitated access to website was not effective in comparison with the other two strategies [13,14]. Two studies (EFAR-FVG and EFAR-Spain) investigating whether facilitated access to e-BI is inferior to face-to-face BI have demonstrated substantial variation among professional and patient

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

engagement with the process, raising questions [15] about which professional characteristics are likely to be responsible for this.

The question is relevant because population predisposition in Catalonia for digital interventions is appropriate. According to the last data available in Catalonia, 44.7 % of Catalans would change some face-to-face appointments in primary health care by digital interventions, specially men, young people, and those who live in big cities[16].

However, the first attempt to assess the implementation of digital brief interventions for risky drinkers was unsuccessful (see results ODHIN project regarding Catalan jurisdiction ) [13]. Catalan health care professionals were offered the option of referring patients to digital brief interventions, but only 15% of cases did so. And this numbers refer to motivated professionals, since they volunteered to participate in the research project[13].

In this context, we hypothesize that professional-related factors might play a relevant role in the implementation of digital interventions and that an exploratory study is needed in order to generate new perspectives in this field. In addition to demographic variables, we hypothesize that factors relating specifically to the professional's experience of digital technology might play a role. Several factors have been shown to be associated with the acceptance of digital therapy[17–19]. The most relevant ones are the Level of Information and Communication Technology (ICT) Use that professionals have (LICTU), Computer Self-efficacy and Perception of Perceived product usability [20–22]. Acceptance of digital interventions by PHCPs may play a role in the engagement of PHCPs in facilitated access to those interventions because PHCPs acts as an advisor being unlikely that professionals recommend an intervention which they do not accept

Computer Self-efficacy is defined as “the judgment of one's capability to use a computer” and the term “usability” has been defined as: "the extent to which a product can be used by specified users

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use"[23]. Computer self-efficacy (SE)[24–28] and Perception of Perceived product usability [29] have demonstrated potential as predictors of implementation of digital-based health interventions in both patients and professionals [30–33]. Computer experiences of the health care professionals – defined in our study as LICTU – have been found to be positively associated with the implementation of telemedicine in Spanish physicians' practice. [20]. The roles of LICTU, Computer self-efficacy, and Perceived product usability in engagement by professionals in facilitated access are unknown, but in the context of the present study it was hypothesized that higher levels of Computer self-efficacy, LICTU and Perceived product usability would be associated with better engagement.

Of note, customisation of m-health or e-health is relevant in terms of engagement according to the users' opinion(e.g. young adults in m-health project to prevent weight gain preferred personalised text messages, e-mails and feedback)[34] and the experts in e-health solutions (e.g. tailoring contents and extent of personalisation based on user characteristics or preference) [35]. So, we took into account the customisation of the website by professionals as a potential co-variable, which might impact on facilitated access. In the present study, health professionals could customise certain messages (including introductory and feedback messages), introductory picture and video. According to the patients' perspective in the Italian version of the project, "personalisation brings confidence in the content of the website[36] "

The aim of the present study is to determine whether professionals computer experiences (LICTU), computer self-efficacy, and perceived product usability have an influence on facilitated access.

## 2. Methods

### 2.1 Design

The study was nested in the framework of EFAR-Spain (Catalonia), a randomized controlled non-inferiority trial of primary care-based facilitated access to an alcohol reduction website [37], a Spanish adaptation of the UK “Down your Drink (DyD)” website [38]. A total of 101 primary health care professionals (PHCPs) in 34 primary health care centres in Catalonia were recruited to provide facilitated access to an alcohol reduction website by actively distributing brochures with a unique and personal log-on code among their patients. Patients logging on to the website were initially screened for risky alcohol use using the Alcohol Use Disorder Identification Test short version (AUDIT-C) [39] and those who screened positive (> 4 for men and > 3 for women) were invited to take part in the study and were subsequently asked to complete socio-demographic information and the AUDIT and Quality of Life (EQ5D5) questionnaires [40,41] before undergoing randomization to face-to-face brief intervention or online brief intervention. AUDIT-C is a 3-item questionnaire based on frequency and quantity of alcohol intake; its main objective is to identify risky drinkers. The scores range from 0 to 12 being sensitivity 0.86, specificity 0.89 for men, and sensitivity 0.73, specificity 0.91 for women [42]. On the other hand, AUDIT is a 10-item questionnaire, which includes items related to abuse and dependence. The scores range from 0 to 40 (8-15 risky use; 16-19 abuse; ≥ 20 dependence). EQ5D5 is a standardized measure of health status developed by EuroQol Group, with five domains (mobility, self-care, pain/discomfort, usual activities and depression/anxiety) and a visual analogue scale. It has been validated in Spanish population [40].

Professionals were recruited from the XaROH network (Network of Alcohol Referents in Primary Health Care) by advertisements in the network management platform to attend a 3-hour training workshop on new technologies in primary care. All PHCPs underwent a 3-hour training session before the launch of the project in which they were given opportunities to familiarise themselves

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

with all aspects of the alcohol reduction website and to learn how to customise the Download your Doctor module. They were also taught about the theoretical principles and practice of alcohol screening and brief intervention and e-BI. The PHCPs were encouraged both to familiarise themselves with the website and to make full use of the “Download your Doctor” module, designed to enable simulation of the professional’s presence online[43]. The module enabled the PHCPs to personally customise selected messages and visual elements of the user interface to be presented to their patients following log-on to the website. Each practitioner was additionally able to upload a photograph and a signature to insert to their messages on the website, and each message could be customised by inserting links and images shown in a “speech bubble” next to text and photo. Finally, they were also given the option to upload video recordings in order to simulate online communication with their patients even more directly[44].

The Download your doctor module was designed to enhance therapeutic alliance and patients’ access to the website. Nurses and general practitioners could customise messages (e.g. welcome, feedback) and visual elements, and upload a personal photo, signature, and video recordings. If their doctor or nurse did not individualise the module, predetermined messages, visual elements and photos designed by the research team were showed to the patients. For more details see Lygidakis et al 2016[36]”.

## 2.2 Participants

101 primary health care professionals (nurses and general practitioners) from 34 centres were recruited and trained. Professionals were recruited from the XaROH network (Network of Alcohol Referents in Primary Health Care). There were no exclusion criteria.

Of note, professionals didn’t have to screen patients before handing out the brochures. The website screened patients for risky alcohol use itself using AUDIT-C without previous screening by the professional. Nurses and General Practitioners might hand out brochures to all their patients.

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

Professionals received a financial incentive of €20 per patient recruited during the EFAR clinical trial (analyses not included in this publication).

### 2.3 Assessment

A self-administered questionnaire was used to obtain socio-demographic information including gender, profession (nurse or general practitioner) and age. Level of Information and Communication Technology Use was assessed on the basis of self-reported hours per day of digital use and years of computer use. Age of the professional together with the age of the first contact with computers allowed calculating years of computer use for each professional (years of computer use= age of the professional – age of first contact with computer). Computer Self-Efficacy was measured using the Computer Self-Efficacy Scale (CSES) [45], which consists of a 12-item scale (e.g. “I am able to use the internet to search for information and resources” or “I am able to use Presentation Software (e.g., Microsoft PowerPoint) for classroom delivery”), with each item scoring from 1 to 7 and a total score range of 12 to 84. The reliability based on Cronbach’s alpha is 0.68-0.83 (Basic Computer Skills factor 0.71, Media-Related Skills factor 0.83 and Web-Based Skills factor 0.68) [45]. In absence of previous literature, the median of the total sample of this variable was used as a cut-off point to define high computer self-efficacy (51 points or higher). The System Usability Scale (SUS) was chosen to assess the usability of the alcohol reduction website [29,46]. The SUS was designed for rapid assessment of all perceived product usability related aspects[47]. The SUS is a 10-item scale (e.g. “I thought the system was easy to use” or “I think that I would like to use this system frequently”), with each item scoring from 0 to 4 and the total score range from 0 to 100 (because the result is multiplied by conversion factor of 2.5 according to the authors’ recommendation). The reliability based on Cronbach’s alpha is 0.91[46]. Higher scores indicate a better rating of perceived product usability. A score of 69 points or higher is considered to indicate good usability[47].

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

Prior to the start of the training session, the PHCPs were invited to fill out the demographic questionnaire and the questionnaire about Level of Information and Communication Technology Use and the CSES. Subsequent to the training session, they were asked to rate the alcohol reduction website using the SUS.

A member of the research team (HLP) assessed the level of website customisation for each PHCP 3 months after the start of the trial. Customisation was rated as positive if the participating PHCP had customised at least one element of the Download your Doctor module.

We rated each PHCP's level of engagement in facilitated access on the basis of the number of brochures distributed to their patients in the first 6 months of the trial. This was assessed on self-report and subsequent check by telephone interview. Professionals could update in their professional (private) section of the website the number of brochures that they handed out as frequently as they wanted to. However, professionals were contacted through a telephone interview once in the month 6 in order to have homogenous and updated data.

Main independent variables were as follows:

- LICTU defined by the following continuous variables: 1) Years of Computer Use ; 2) Hours of Computer or other Digital Technologies Use per day
- Perceived product usability as continuous variable
- Computer self-efficacy as continuous variable

Main outcome (dependent variable) was engagement of professionals in facilitated access defined by the number of brochures distributed per professional.

Professionals' early engagement to the website was assessed by customisation of the module "Download your Doctor" (at least customisation of one section versus no customisation) of the

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

website. Customisation and socio-demographic characteristics were studied in order to explore confounding factors.

#### 2.4 Statistical analysis

Descriptive data are presented in percentages and means. To investigate variables associated with facilitated access, multivariate linear regression (enter method) analyses was performed using, as dependent variables, engagement of professionals in facilitated access (number of brochures handed-out by the professional during the first 6 months of the trial). Independent variables were Perceived product usability, Level of Information and Communication Technology Use and Computer self-efficacy (see above). Co-variables as potential confounders were age, sex, profession and customization of the website. The result of the multivariate linear regression analysis (unstandardised Coefficients B) was considered to be the main outcome, as it determined those variables independently. All statistical analyses were performed with SPSS statistical package version 20.0 and differences with a 'p' value less than 5% were considered statistically significant associated with the outcome.

#### 2.5 Ethical aspects

The protocol was approved by the Ethics Committee of Hospital Clínic (2013/8561) according to the Helsinki Declaration and the national regulations.

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

### **3. Results**

93 of the 101 professionals completed the pre-training assessment (93%), and 79 (79%) subsequently completed the SUS. Eighty-three (89.2%) were females and fifty-two (56.5%) were nurses. Mean age of the professionals was 45.6 (SD 8.9). Fifty-eight professionals (68.2%) –nurses and general practitioners- had customised at least one element of the module. Table 1 shows more details.

#### **3.1 Level of Information and Communication Technology Use (LICTU), Computer Self-efficacy and Perceived product usability Perception**

Mean age of the first contact with computers was at 23.2 years old (SD 11.4), which means that they had been using computers for 22.6 years (SD 6.2). They spent an average of 8.5 hours per day (SD 2.9) using digital devices. Perceived product usability was high for forty-three professionals (54.4%) and the Computer self-efficacy was high for forty-seven (50.5%). Mean computer self-efficacy was 52.3 (SD 13.8) and mean perceived product usability was 68.0 (SD 15.8).

#### **3.2 Facilitated access**

Professional engagement in facilitated access was measured by distributed brochures (mean 21.0, SD 21.2). Seventy-five professionals handed out at least one brochure, and 1781 patients received a brochure (Supplementary table 1). One professional handed out 99 brochures (maximum) and ten professionals did not hand out any brochure (minimum).

#### **3.3. Impact of LICTU, Computer self-efficacy and Perceived product usability on facilitated access**

Linear regression showed no association between LICTU, Computer self-efficacy or Perceived product usability and facilitated access outcome. Customization of website by healthcare professionals was associated with professional engagement in facilitated access (Unstandardised

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

Coefficient B 15.7 CI95% 3.5 to 27.8). Then if customisation of the website is present, the professional engagement in facilitated access variable will increase by 15.7 units. See table 2 for more details. Those professionals who individualised the “Doctor module” increased the distribution of brochures between 3.5 and 27.8% compared with those who did not.

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#### **4. Discussion and Conclusion**

We have carried out an exploratory study to investigate the factors affecting engagement of health care professionals and their patients in facilitated access to a screening and alcohol reduction website in the context of a randomised trial of two modes of brief interventions. Engagement in facilitated access was not predicted by professionals' assessment of Perceived product usability, Computer self-efficacy, or LICTU. While there was no relationship between socio-demographic characteristics, we found that customisation of website is associated to subsequent engagement in facilitated access— increasing 15.7 of professional engagement with facilitated access if customisation is present. While Perceived product usability, Computer self-efficacy and LICTU are relevant for final users[17–22], these three concepts have a marginal role when a facilitator of e-BI – e.g. general practitioner - is on the focus and in the context of Catalan Health System. This finding suggests that future researches should focus on the role of customisation and previous motivation of health care professionals for implementation.

##### ***4.1. Perceived product usability, computer self-efficacy and Level of Information and Communication Technology Use***

Neither Perceived product usability nor computer self-efficacy were associated with professional's engagement in facilitated access nor professional's success in facilitated access. Perceived product usability ratings by the PHCPs were similar to other implemented technologies such as emergency records software [48]. In interpreting this finding, it is important to consider that Perceived product usability is just one part of the wider concept of usefulness. The other key component is utility, which refers to whether the product's functionality can do what is needed.[49]. The SUS only assessed usability and we were therefore unable to assess the impact of utility on engagement. In

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

addition, Perceived product usability was assessed immediately after training and PHCPs perceptions might have changed following the customisation process.

Engagement with facilitated access was not related to professionals' LICTU. Researchers have identified three variables as predictors of telemedicine use in Spanish physicians: computer experience in personal life, perceived ease-of-use of information and communication technology and propensity to innovation[20]. Our results did not replicate these findings, perhaps because we used a different instrument for assessing LICTU, and had a smaller sample size (n=510 versus n=101). The domain used by Saigí-Rubió et al. was the degree to which the physician uses ICTs outside work and was assessed as a dichotomous variable. We used an instrument measuring years of computer use and hours per day of digital use but we did not differentiate type of use (inside/outside the work). This negative result is relevant because it has implications for training in digital interventions.

#### ***4.2. Socio-demographic characteristics and website customisation***

Engagement with facilitated access was not related to professionals' socio-demographic characteristics. A previous study showed that gender and age are related with e-health use by general practitioners [50]. Another study, which investigated the relationship between socio-demographic factors and referral to e-health interventions, failed to demonstrate any association[51]. In addition, in another study no relationship was found between socio-demographic characteristics of health care professionals and the use of telemedicine [52].

Website customisation was associated with greater levels of subsequent engagement by professionals in facilitated access. One previous study also found that those health professionals who referred more patients to e-BI tended to familiarise themselves with the content of the webpage more frequently than those who did not (40% versus 16%)[13]. This relationship could be due to customization by professionals leading to more subsequent engagement in

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

facilitated access, or it could simply indicate that those who were more motivated tended to customize the website more frequently. Further studies including both customisation and motivation should be performed to further investigate the association with engagement.

#### **4.3. Limitations and strengths**

Our study has several limitations. First, the brochures estimates were obtained through self-report—mostly via the website and alternatively by telephone interview – and might therefore be inaccurate. Second, usability information was provided after professionals had logged on to the website but before they were able to undertake customisation. Thus, professionals who had customised the website might have afterwards improved their perceptions of usability. Third, only perceptions of Perceived product usability, Computer self-efficacy and LICTU were measured and we were not able to obtain objective data from tests using technology platforms or other computer skills. So, the subjective self-assessment of health care professionals regarding their knowledge and skills in digital technologies was explored but it was lacking external and objective validation of their competencies in this field being possible that professionals underestimated or overestimated their ability with digital technologies. Fourth, just one component of usefulness (usability) was assessed. Fifth, primary outcome for engagement in facilitated access (brochures) was an absolute number. It did not provide information about the potential number of patients who might have received brochures. The workload was similar for all professionals in Catalonia (1,500 assigned patients for professional with slight differences across the country) [53–55] and the timeframe is large enough to minimise workload fluctuations. However, we could not control health care professionals' characteristics, such as full-time versus part-time contract, or patient profile in charge (e.g. prevalence of risky drinking) or practice (e.g. socio-economic status). Further studies should take the total number of visited patients into account. In summary, recruiting participants may depend on several other factors which are not measured in this study such as lack of time, number of patients, etc. Another

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

limitation was that accurate data about handed-out brochures was collected but not data about non-acceptance participants (refused brochures). However, the engagement with the facilitated access to the website from professionals' perspective including the ability to get the authorization of the patient was analysed. The study has a number of strengths. To our knowledge, this is the first study to explore the relationship between LICTU, Computer self-efficacy, Perceived product usability and facilitated access. Furthermore, participation in the survey was high (93%) and so the findings are likely to be representative.

#### **4.4. Conclusion**

Facilitated access is a novel technology and implementation is required. Therefore it presents significant challenges to health care professionals. This exploratory study shows that ratings of Computer self-efficacy, LICTU and Perceived product usability by the health professionals appear to have no impact on subsequent engagement in facilitated access by health professionals in the context of Catalonia Primary Health Care System and this kind of facilitated e-intervention access. However, we found that despite the challenges, engagement by professionals with customising the website using the Download your Doctor module might be relevant to their subsequent engagement in facilitated access. Given the potential importance of facilitated access in radically extending the scope of health care, the issues of implementation raised by this exploratory study need to be explored further in subsequent research.

#### **4.5. Practice Implications**

There is no evidence that Computer self-efficacy, LICTU and Perceived product usability have an impact on facilitated access to an e-BI. Efforts should be put on to find what can improve facilitated access. In that sense customisation of the website by healthcare professionals is a promising indicator to predict implementation of e-BI.

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

### **Ethical approval**

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

## References

- [1] World Health Organization, Global status report on alcohol and health, 2014.
- [2] M. Roerecke, A. Gual, J. Rehm, Reduction of alcohol consumption and subsequent mortality in alcohol use disorders: systematic review and meta-analyses., *J. Clin. Psychiatry.* 74 (2013) e1181-9. doi:10.4088/JCP.13r08379.
- [3] E.F.S. Kaner, H.O. Dickinson, F.R. Beyer, F. Campbell, C. Schlesinger, N. Heather, J.B. Saunders, B. Burnand, E.D. Pienaar, Effectiveness of brief alcohol interventions in primary care populations, *Cochrane Database Syst. Rev.* (2009). <http://www.scopus.com/inward/record.url?eid=2-s2.0-77950228136&partnerID=tZ0tx3y1>.
- [4] K. Colin Drummond, Amy Wolstenholme, Paolo Deluca, Zoe Davey, C.G. Donoghue, Catherine Elzerbi, Antoni Gual, Noemí Robles, S. Julian Strizek, Christine Godfrey, Karl Mann, Evangelos Zois, C. Hoffman, Gerhard Gmel, Hervé Kuendig, Emanuele Scafato, S. Gandin, Jillian Reynolds, Lidia Segura, Joan Colom, Begoña Baena, C.& E. Kaner, Alcohol interventions and treatment in Europe., 2013. [http://amphoraproject.net/w2box/data/e-book/Chapter 9 - AM\\_E-BOOK\\_2nd edition - July 2013.pdf](http://amphoraproject.net/w2box/data/e-book/Chapter 9 - AM_E-BOOK_2nd edition - July 2013.pdf).
- [5] P. Anderson, D. Chisholm, D.C. Fuhr, Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol., *Lancet.* 373 (2009) 2234–46. doi:10.1016/S0140-6736(09)60744-3.
- [6] A. Wolstenholme, C. Drummond, P. Deluca, Z. Davey, C. Elzerbi, A. Gual, N. Robles, J. Reynolds, C. Goos, J. Strizek, C. Godfrey, K. Mann, E. Zois, S. Hoffman, G. Gmel, H. Kuendig, E. Scafato, C. Gandin, S. Coulton, J. Colom, L. Segura, B. Baena, Report on the mapping of European need and service provision for early diagnosis and treatment of alcohol use disorders, 2013. [http://amphoraproject.net/w2box/data/Deliverables/AMPHORA\\_WP6\\_D2.5.pdf](http://amphoraproject.net/w2box/data/Deliverables/AMPHORA_WP6_D2.5.pdf).
- [7] M.N. Keurhorst, P. Anderson, F. Spak, P. Bendtsen, L. Segura, J. Colom, J. Reynolds, C. Drummond, P. Deluca, B. van Steenkiste, A. Mierzecki, K. Kłoda, P. Wallace, D. Newbury-Birch, E. Kaner, T. Gual, M.G.H. Laurant, Implementing training and support, financial reimbursement, and referral to an internet-based brief advice program to improve the early identification of hazardous and harmful alcohol consumption in primary care (ODHIN): study protocol for a cluster rando, *Implement. Sci.* 8 (2013) 11. doi:10.1186/1748-5908-8-11.
- [8] K. Donoghue, R. Patton, T. Phillips, P. Deluca, C. Drummond, The effectiveness of electronic screening and brief intervention for reducing levels of alcohol consumption: a systematic review and meta-analysis., *J. Med. Internet Res.* 16 (2014) e142. doi:10.2196/jmir.3193.
- [9] K.B. Carey, L.A.J. Scott-Sheldon, J.C. Elliott, J.R. Bolles, M.P. Carey, Computer-delivered interventions to reduce college student drinking: a meta-analysis., *Addiction.* 104 (2009) 1807–19. doi:10.1111/j.1360-0443.2009.02691.x.
- [10] P. Wallace, P. Bendtsen, Internet applications for screening and brief interventions for alcohol in primary care settings - implementation and sustainability., *Front. Psychiatry.* 5 (2014) 151. doi:10.3389/fpsy.2014.00151.
- [11] J. Proudfoot, D. Goldberg, A. Mann, B. Everitt, I. Marks, J.A. Gray, Computerized, interactive, multimedia cognitive-behavioural program for anxiety and depression in general practice., *Psychol. Med.* 33 (2003) 217–27. <http://www.ncbi.nlm.nih.gov/pubmed/12622301> (accessed August 31, 2015).

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- [12] E.B. Davies, R. Morriss, C. Glazebrook, Computer-delivered and web-based interventions to improve depression, anxiety, and psychological well-being of university students: a systematic review and meta-analysis., *J. Med. Internet Res.* 16 (2014) e130. doi:10.2196/jmir.3142.
- [13] P. Bendtsen, U. Müssener, N. Karlsson, H. López-Pelayo, J. Palacio-Vieira, J. Colom, A. Gual, J. Reynolds, P. Wallace, L. Segura, P. Anderson, Implementing referral to an electronic alcohol brief advice website in primary healthcare: results from the ODHIN implementation trial., *BMJ Open.* 6 (2016) e010271. doi:10.1136/bmjopen-2015-010271.
- [14] P. Anderson, P. Bendtsen, F. Spak, J. Reynolds, C. Drummond, L. Segura, M.N. Keurhorst, J. Palacio-Vieira, M. Wojnar, K. Parkinson, J. Colom, K. Kłoda, P. Deluca, B. Baena, D. Newbury-Birch, P. Wallace, M. Heinen, A. Wolstenholme, B. van Steenkiste, A. Mierzecki, K. Okulicz-Kozaryn, G. Ronda, E. Kaner, M.G.H. Laurant, S. Coulton, T. Gual, Improving the delivery of brief interventions for heavy drinking in primary health care: outcome results of the ODHIN five country cluster randomized factorial trial, *Addiction.* (2016). doi:10.1111/add.13476.
- [15] P. Wallace, P. Struzzo, R. della Vedova, C. Tersar, L. Verbano, H. Lygidakis, R. MacGregor, N. Freemantle, E. Scafato, Randomised controlled non-inferiority trial of primary care based facilitated access to an alcohol reduction website (EFAR-FVG), *Addict. Sci. Clin. Pract.* 8 (2013) A83. doi:10.1186/1940-0640-8-S1-A83.
- [16] Departament de Salut. [Generalitat de Catalunya, Òmnibus de la Generalitat de Catalunya, 2016.](#)
- [17] L.L. Alpay, O.B. Henkemans, W. Otten, T.A.J.M. Rövekamp, A.C.M. Dumay, E-health applications and services for patient empowerment: directions for best practices in The Netherlands., *Telemed. J. E. Health.* 16 (2010) 787–91. doi:10.1089/tmj.2009.0156.
- [18] L. Griebel, B. Sedlmayr, H.-U. Prokosch, M. Criegee-Rieck, M. Sedlmayr, Key factors for a successful implementation of personalized e-health services., *Stud. Health Technol. Inform.* 192 (2013) 965. <http://www.ncbi.nlm.nih.gov/pubmed/23920739> (accessed June 23, 2016).
- [19] H. Christensen, J. Reynolds, K.M. Griffiths, The use of e-health applications for anxiety and depression in young people: challenges and solutions., *Early Interv. Psychiatry.* 5 Suppl 1 (2011) 58–62. doi:10.1111/j.1751-7893.2010.00242.x.
- [20] F. Saigí-Rubió, J. Torrent-Sellens, A. Jiménez-Zarco, Drivers of telemedicine use: comparative evidence from samples of Spanish, Colombian and Bolivian physicians., *Implement. Sci.* 9 (2014) 128. doi:10.1186/s13012-014-0128-6.
- [21] G. Tognoll, F. Marcatto, S. Plet, P. Struzzo, P. Wallace, D. Ferrante, Usability Testing of a Website about Alcohol and Health: A Case Study, in: *Trieste Symp. Percept. Cogn. Trieste, Italy, Vol. TSPC2014. Proc. Trieste Symp. Percept. Cogn., 2014.*
- [22] K. Lindblom, T. Gregory, C. Wilson, I.H.K. Flight, I. Zajac, The impact of computer self-efficacy, computer anxiety, and perceived usability and acceptability on the efficacy of a decision support tool for colorectal cancer screening, *J. Am. Med. Informatics Assoc.* 19 (2012) 407–412. doi:10.1136/amiajnl-2011-000225.
- [23] The International Organization for Standardization, Ergonomics of human-system interaction — Part 11: Usability: Definitions and concepts, (2010). <https://www.iso.org/obp/ui/#iso:std:iso:9241:-11:dis:ed-2:v1:en> (accessed December 15, 2015).

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- [24] H.K. Sam, A. Ekhsan, A. Othman, Z.S. Nordin, Computer Self-Efficacy , Computer Anxiety , and Attitudes toward the Internet : A Study among Undergraduates in Unimas Purpose of the research, 8 (2005) 205–219.
- [25] A. Bandura, Guide for constructing self-efficacy scales, *Self-Efficacy Beliefs Adolesc.* (2006) 307–337.
- [26] G. Torkzadeh, T.P. Van Dyke, Effects of training on Internet self-efficacy and computer user attitudes, *Comput. Human Behav.* 18 (2002) 479–494. doi:10.1016/S0747-5632(02)00010-9.
- [27] O. Khorrami-Arani, Researching computer self-efficacy, *Int. Educ. J.* 2 (2001) 17–25. <http://www.flinders.edu.au/education/iej>.
- [28] M.Y. Yi, Y. Hwang, Predicting the use of web-based information systems: Self-efficacy, enjoyment, learning goal orientation, and the technology acceptance model, *Int. J. Hum. Comput. Stud.* 59 (2003) 431–449. doi:10.1016/S1071-5819(03)00114-9.
- [29] A. Bangor, P. Kortum, J. Miller, Determining what individual SUS scores mean: Adding an adjective rating scale, *J. Usability Stud.* 4 (2009) 114–123. doi:66.39.39.113.
- [30] S.J. Czaja, N. Charness, A.D. Fisk, C. Hertzog, S.N. Nair, W.A. Rogers, J. Sharit, Factors predicting the use of technology: findings from the Center for Research and Education on Aging and Technology Enhancement (CREATE)., *Psychol. Aging.* 21 (2006) 333–352. doi:10.1037/0882-7974.21.2.333.
- [31] K. Glaister, The presence of mathematics and computer anxiety in nursing students and their effects on medication dosage calculations., *Nurse Educ. Today.* 27 (2007) 341–7. doi:10.1016/j.nedt.2006.05.015.
- [32] F.J. Kay-Lambkin, A.L. Simpson, J. Bowman, S. Childs, Dissemination of a computer-based psychological treatment in a drug and alcohol clinical service: an observational study., *Addict. Sci. Clin. Pract.* 9 (2014) 15. doi:10.1186/1940-0640-9-15.
- [33] L.H. Schneider, H.D. Hadjistavropoulos, When in doubt, ask the audience: Potential users’ perceptions of Internet-delivered cognitive behavioural therapy for chronic pain., *Pain Res. Manag.* 19 (2014) 173–8. <http://www.ncbi.nlm.nih.gov/pubmed/24911177>.
- [34] S.R. Partridge, M. Allman-Farinelli, K. McGeechan, K. Balestracci, A.T.Y. Wong, L. Hebden, M.F. Harris, A. Bauman, P. Phongsavan, Process evaluation of TXT2BFIT: a multi-component mHealth randomised controlled trial to prevent weight gain in young adults., *Int. J. Behav. Nutr. Phys. Act.* 13 (2016) 7. doi:10.1186/s12966-016-0329-2.
- [35] B.M. Bewick, S.J. Ondersma, M.T. Høybye, O. Blakstad, M. Blankers, H. Brendryen, P.F. Helland, A.B. Johansen, P. Wallace, K. Sinadinovic, C. Sundström, A.H. Berman, Key Intervention Characteristics in e-Health: Steps Towards Standardized Communication, *Int. J. Behav. Med.* 24 (2017) 659–664. doi:10.1007/s12529-016-9630-3.
- [36] C. Lygidakis, P. Wallace, C. Tersar, F. Marcatto, D. Ferrante, R. Della Vedova, F. Scafuri, E. Scafato, P. Struzzo, Download Your Doctor: Implementation of a Digitally Mediated Personal Physician Presence to Enhance Patient Engagement With a Health-Promoting Internet Application., *JMIR Res. Protoc.* 5 (2016) e36. doi:10.2196/resprot.5232.
- [37] H. López-Pelayo, P. Wallace, L. Segura, L. Miquel, E. Díaz, L. Teixidó, B. Baena, P. Struzzo, J. Palacio-Vieira, C. Casajuana, J. Colom, A. Gual, A randomised controlled non-inferiority trial of primary care-based facilitated access to an alcohol reduction website (EFAR Spain): the study

Hugo López-Pelayo<sup>1</sup>, Paul Wallace<sup>3</sup>, Laia Miquel<sup>2</sup>, Lidia Segura<sup>4</sup>, Begoña Baena<sup>4</sup>, Pablo Barrio<sup>1</sup>, Joan Colom<sup>4</sup>, Antoni Gual<sup>2</sup> on behalf of EFAR group.

- protocol., *BMJ Open*. 4 (2014) e007130. doi:10.1136/bmjopen-2014-007130.
- [38] P. Wallace, E. Murray, J. McCambridge, Z. Khadjesari, I.R. White, S.G. Thompson, E. Kalaitzaki, C. Godfrey, S. Linke, On-line randomized controlled trial of an internet based psychologically enhanced intervention for people with hazardous alcohol consumption., *PLoS One*. 6 (2011) e14740. doi:10.1371/journal.pone.0014740.
- [39] A. Gual, L. Segura, M. Contel, N. Heather, J. Colom, AUDIT-3 AND AUDIT-4: EFFECTIVENESS OF TWO SHORT FORMS OF THE ALCOHOL USE DISORDERS IDENTIFICATION TEST, *Alcohol Alcohol*. 37 (2002) 591–596. <http://alcalc.oxfordjournals.org/content/37/6/591.abstract>.
- [40] X. Badia, A. Schiaffino, J. Alonso, M. Herdman, Using the EuroQol 5-D in the Catalan general population: Feasibility and construct validity, *Qual. Life Res.* 7 (1998) 311–322. doi:10.1023/A:1008894502042.
- [41] X. Badia, M. Roset, S. Montserrat, M. Herdman, A. Segura, [La versión española del EuroQol: Descripción y aplicaciones](#), *Med. Clin. (Barc)*. 112 (1999) 79–86. <http://www.scopus.com/inward/record.url?eid=2-s2.0-0006942658&partnerID=tZOtx3y1>.
- [42] K.A. Bradley, A.F. DeBenedetti, R.J. Volk, E.C. Williams, D. Frank, D.R. Kivlahan, AUDIT-C as a Brief Screen for Alcohol Misuse in Primary Care, *Alcohol. Clin. Exp. Res.* 31 (2007) 1208–1217. doi:10.1111/j.1530-0277.2007.00403.x.
- [43] C. Lygidakis, P. Wallace, C. Tersar, F. Marcatto, D. Ferrante, R. Della Vedova, F. Scafuri, E. Scafato, P. Struzzo, Download your doctor: use of digitally-mediated personal physician presence to enhance patient engagement with health-promoting internet applications, *JMIR Res. Protoc.* (under Rev. (n.d.)).
- [44] EFAR, *Alcohol y Salud*, (2014). [www.alcoholysalud.cat](http://www.alcoholysalud.cat) (accessed December 15, 2015).
- [45] T. Teo, J.L.K. Hwee, Assessing the dimensionality of computer self-efficacy among pre-service teachers in Singapore : a structural equation modeling approach, *Int. J. Educ. Dev. Using Inf. Commun. Technol.* 6 (2010) 7–18.
- [46] A. Bangor, P.T. Kortum, J.T. Miller, An Empirical Evaluation of the System Usability Scale, *Int. J. Hum. Comput. Interact.* 24 (2008) 574–594. doi:10.1080/10447310802205776.
- [47] J. Sauro, Measuring Usability With The System Usability Scale (SUS), *Meas. Usability.* (2011) 1–5.
- [48] M.S. Kim, J.S. Shapiro, N. Genes, M. V Aguilar, D. Mohrer, K. Baumlin, J.L. Belden, A pilot study on usability analysis of emergency department information system by nurses., *Appl. Clin. Inform.* 3 (2012) 135–53. doi:10.4338/ACI-2011-11-RA-0065.
- [49] A.M. Lindquist, P.E. Johansson, G.I. Petersson, B.-I. Saveman, G.C. Nilsson, The Use of the Personal Digital Assistant (PDA) Among Personnel and Students in Health Care: A Review, *J. Med. Internet Res.* 10 (2008) e31. doi:10.2196/jmir.1038.
- [50] J.M. Ortega Egea, M.V.R. González, M.R. Menéndez, eHealth usage patterns of European general practitioners: a five-year (2002-2007) comparative study., *Int. J. Med. Inform.* 79 (2010) 539–53. doi:10.1016/j.ijmedinf.2010.05.003.
- [51] R.J. Spaulding, T. Russo, D.J. Cook, G.C. Doolittle, Diffusion theory and telemedicine adoption by Kansas health-care providers: critical factors in telemedicine adoption for improved patient access., *J. Telemed. Telecare.* 11 Suppl 1 (2005) 107–9. doi:10.1258/1357633054461903.

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[52] A. Roth, O. Rogowski, Y. Yanay, M. Kehati, N. Malov, M. Golovner, Teleconsultation for cardiac patients: a comparison between nurses and physicians: the SHL experience in Israel., *Telemed. J. E. Health.* 12 (2006) 528–34. doi:10.1089/tmj.2006.12.528.

[53] [AIAQS, Central de Resultados Atención primaria Versión para la ciudadanía, 2012.](#)

[54] R. Villaescusa Sáiz, A. Puente, R. Pérez, G. Martín, Cargas de trabajo de los médicos de atención primaria del Instituto Catalán de la Salud, *Atención Primaria.* 43 (2011) 214–215. doi:10.1016/j.aprim.2010.03.015.

[55] [Departament de Salut. Generalitat de Catalunya, Els serveis per a la salut: mirant cap al futur. Mapa sanitari, sociosanitari i de salut pública, 2010.   
http://salutweb.gencat.cat/web/.content/home/ambits\\_tematicos/linies\\_dactuacio/model\\_as\\_sistencial/mapa\\_sanitari\\_sociosanitari\\_i\\_salut\\_publica/que\\_es/documents/ssalut\\_futur.pdf.](#)

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