Universitat Autònoma de Barcelona

Impacto de la implementación de una herramienta de colaboración clínica en red (ECOPIH) entre profesionales de atención primaria y especializada en la reducción del número de derivaciones

David Lacasta Tintorer

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Impacto de la implementación de una herramienta de colaboración clínica en red (ECOPIH) entre profesionales de atención primaria y especializada en la reducción del número de derivaciones

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A mi padre

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Lista de abreviaciones

ECOPIH: Herramienta de Comunicación Online entre Primaria y Hospital

AP: Atención Primaria

AE: Atención Especializada

CoPC: Comunidad de Práctica Clínica

PC: Primary Care

SC: Specialist Care

TIC: Tecnología de la Información y Comunicación

CoP: Comunidad de Práctica

TAM: Technology Acceptance Model

SAP: Servicio de Atención Primaria

CAP: Centro de Atención Primaria

AFE: Análisis Factorial Exploratorio

Logit: Regresión Logística Binaria

DPO: Dirección por Objetivos

ENT: Entrevistado

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1. Resumen

En las consultas de Atención Primaria (AP) se abordan multitud de problemas de salud. Disponer de sistemas de comunicación con los profesionales de la Atención Especializada (AE) ayuda a manejar estos problemas de una forma autónoma, eficaz, eficiente y satisfactoria tanto para el paciente como para el profesional. En los últimos años las consultorías presenciales han perdido peso a favor la telemedicina. Existen multitud de experiencias de telemedicina destinadas a mejorar esta comunicación.

En el año 2009 se diseñó la plataforma ECOPIH (Herramienta de Comunicación Online entre Primaria y Hospital), que es una Comunidad de Práctica Clínica (CoPC) que pone en contacto profesionales sanitarios (personal médico y de enfermería) de AP con otros profesionales de AE, permitiendo consultar casos clínicos y compartir información de interés. Creemos que el uso de esta herramienta puede lograr disminuir las derivaciones desde AP, así como mejorar la comunicación entre niveles asistenciales.

Los resultados obtenidos muestran que el uso de la plataforma ECOPIH permite disminuir el número de derivaciones de AP a AE, en las especialidades de Cardiología, Endocrinología y Gastroenterología. Los factores que determinan un mayor uso por parte de los médicos de AP son la utilidad percibida para reducir los costes (tiempo y costes económicos) que el uso de ECOPIH implica y el perfil de usuario en términos de frecuencia de uso de las redes sociales. Por otro lado, para las enfermeras de AP, los factores discriminantes fueron la utilidad para mejorar la calidad de la práctica clínica y la percepción de facilidad de uso de la plataforma.

En cuanto a la valoración cualitativa, se ha detectado que la rapidez, eficacia, la transferencia a la práctica clínica y el aspecto colaborativo son aspectos positivos de la herramienta. Por otro lado, para lograr la sostenibilidad de una CoPC es preciso contar con el apoyo de la institución, que implemente los cambios organizativos necesarios para

asegurar un tiempo de dedicación y un reconocimiento de la participación de los profesionales, en forma de compensación económica o incluyéndolo en la cartera de servicios.

2. Abstract

A multitude of health problems are addressed in Primary Care (PC) surgeries. Having systems for communication with Specialist Care (SC) professionals helps to ensure that such problems are dealt with in a more autonomous, effective, efficient and satisfactory way for both the patient and the healthcare professional. In recent years, face-to-face consultations have lost ground to telemedicine. There are many telemedicine experiences aimed at improving such communication.

In 2009, the *Online Communication Tool between Primary Care and Hospital Care* (ECOPIH) was designed. It is a Community of Clinical Practice (CoCP) that puts PC healthcare professionals (physicians and nurses) in touch with SC professionals, thus allowing clinical cases to be raised for consultation, and information to be shared. We believe that using this tool can reduce the number of referrals from PC and improve communication between care levels.

The results obtained show that using ECOPIH enables the number of referrals from PC to SC to be reduced in three specialties: Cardiology, Endocrinology and Gastroenterology. The factors determining PC physicians' greater use of ECOPIH are the perceived usefulness for reducing costs (time and financial costs), which the platform's use implies, and the user profile in terms of frequency of social media use. For PC nurses, on the other hand, the discriminant factors are the platform's usefulness in terms of improving the quality of clinical practice, and its perceived ease of use.

Regarding the qualitative assessment, the tool's positive aspects were found to be speed, effectiveness, transferability to clinical practice and collaboration. Meanwhile, to ensure that a CoCP is sustainable, the support of the institution in which it is deployed is required in order to implement the necessary organisational changes. Such changes include

allowing staff to have dedicated time to spend on using a CoCP, and recognising the healthcare professionals’ involvement in it by means of financial reward or by incorporating it into the service portfolio.

3. Introducción

3.1. Gestión de las dudas

El papel de la AP es fundamental en el marco actual de contención del gasto sanitario, porque gestionada eficazmente se convierte en un instrumento útil para evitar derivaciones innecesarias y reducir las listas de espera [1–3]. Las consultas médicas de AP se caracterizan por atender a un elevado número de pacientes, con varios problemas de salud y mayor complejidad clínica [4–6], cosa que obliga a los médicos a manejar varios motivos de consulta, que pueden generar multitud de dudas en la práctica clínica diaria [7–10]. Es decir, que aunque el índice de resolución de problemas en la consulta de AP supera el 90%, a menudo surgen dudas sobre la actitud a tomar que dificultan o impiden la toma de decisiones (un estudio de Louro González en 2009 detectó 1,7 dudas/paciente, el 92% sobre problemas clínicos, el 51,6% se resolvían el mismo día y el 37,7% generaban nuevas citas, ya sea en la misma consulta o con el médico especialista) [5]. Es por ello que estos profesionales requieren de un sistema eficaz de búsqueda y obtención de información que no sólo les permita actualizar sus conocimientos, sino además poder dar respuesta a los problemas de los pacientes de forma eficiente y eficaz [11–13]. Aunque las dudas son un aspecto consustancial al propio trabajo diario, los médicos de AP deben aprender a convivir tanto con éstas como con su manejo en resolverlas [5]. Obtener una rápida respuesta a estas preguntas es, además de una potente herramienta de ayuda en el manejo del paciente [14], una eficaz vía de aprendizaje [15]. Por otro lado, la progresiva expansión del conocimiento médico, debido al incremento en la complejidad de la atención sanitaria y el envejecimiento de la población, dificultan mantener el conocimiento y la práctica actuales [7–9], por lo que los médicos tienen que ser capaces de refrescar sus recuerdos y actualizar sus conocimientos [16], sobre todo cuando se ha demostrado que la disminución de los conocimientos del médico está en relación con el aumento de los años de práctica [17].

Según Del Fiol, el clínico busca respuesta a gran parte de las dudas que se generan en la consulta [10], y hasta un tercio de ellas lo hace en el mismo momento en que surgen [18,19]. Las preguntas no contestadas constituyen una oportunidad para mejorar la atención al paciente y para el auto-aprendizaje basado en la propia práctica clínica [10], y los estudios han demostrado que la búsqueda de información tiene un efecto positivo en el rendimiento de los clínicos y los resultados en los pacientes [20–22]. El tiempo que se destina a buscar estas respuestas es muy variable, entre 2 y 5 minutos según la complejidad de la cuestión y hasta 32 minutos si se busca fuera de la consulta, y en ocasiones puede llegar a ser mayor que el tiempo necesario para atender a un paciente [10,14,16,23]. A pesar de eso, con la introducción de la tecnología se redujo de forma drástica el tiempo que se destinaba a la búsqueda de la evidencia [16]. Existen diferentes obstáculos que dificultan hallar respuestas, siendo la falta de tiempo el más frecuente [10,12,16,23–25], por lo que la rapidez con la que se accede a la información es un aspecto clave [16]. Otras barreras que se han encontrado han sido: las interrupciones, la falta de habilidades con las Tecnologías de la Información y Comunicación (TICs), la creencia que la respuesta no se hallará o que la que se encuentre no será relevante o resolutiva, el desconocimiento de dónde encontrar esa información, la incapacidad de la búsqueda en la literatura para responder directamente preguntas clínicas o la falta de evidencia científica para responder las cuestiones concretas que aparecen en la práctica clínica [16,18,19,26]. Por lo tanto, los profesionales valoran que se acceda a la información de forma rápida y con un esfuerzo cognitivo mínimo [5,10], con consejos prácticos que se puedan aplicar directamente a la atención al paciente, mediante una interfaz amigable e intuitiva (con función de búsqueda o índice rápido de usar) y con la información concreta, bien organizada y disponible las 24 horas del día [12,14,18,27].

Las sesiones clínicas y las conversaciones individuales con la AE, presenciales o telefónicas, son opciones que permiten resolver estas cuestiones. Pero ante la saturación del sistema sanitario, la comunicación entre la AP y la AE no es fácil, rápida ni eficaz [28–31], generándose muchas derivaciones a la AE mediante la hospitalización o la interconsulta en el área de consultas externas. Este hecho no sólo implica una excesiva demora en las citaciones [5,32], sino que además supone un incremento importante de los costes económicos, temporales y psicológicos que sufren médicos y pacientes. Y es que tal y como señalan Horner *et al*., un 65% de las derivaciones son inapropiadas y hasta un 30% de las mismas podrían ser evitadas [33]. Las tasas de derivaciones en nuestro país son próximas a las tasas europeas [34].

Entre los factores asociados a una mayor tasa de derivación destacan la escasa coordinación entre niveles asistenciales y la falta de formación [28,35–37]. Mejorar esta colaboración no sólo mejoraría la atención de la salud, sino que además sería de gran valor educativo y supondría un uso más coste-efectivo de los servicios de salud [2,38]. Otros factores relacionados son la presión ejercida sobre el médico, el derecho del paciente a ser visto por especialistas, la presión de los medios de comunicación, la falta de coordinación entre niveles, la presión asistencial, la falta de recursos, la práctica de una medicina defensiva, la poca tolerancia a la incertidumbre por parte de los médicos de AP, la falta de formación, las listas de espera y aspectos asociados a la relación médico-paciente [28,35–37]. Además del número de derivaciones es importante la adecuación de las mismas [39]. Dada la complejidad del tema, cualquier intervención que pretenda modificar las tasas de derivaciones debe tener en cuenta todos estos factores relacionados con el profesional individual, con el paciente y la organización sanitaria [36,39]. Se han llevado a cabo numerosos análisis de acciones para reducir el número de derivaciones, la mayoría de ellas de escasa rigurosidad, siendo las intervenciones educativas por parte de los especialistas y el uso de plantillas estructuradas de derivación los métodos que mayor eficacia han demostrado [40,41].

Entre los recursos más tradicionales para resolver las dudas destacan el contacto directo con otros profesionales mediante consultorías presenciales, la vía telefónica (muy útil para cuestiones urgentes) o las conversaciones informales de pasillo [33], resaltando el poder de la comunicación verbal para comentar de forma más precisa y comprensible los casos [27,42]. Cada una estas vías de comunicación posee unas características muy positivas en cuanto a la inmediatez de la respuesta o el poder tener en cuenta detalles o matices a la hora debatir un caso, pero también importantes limitaciones, como lo disruptivas que son las llamadas telefónicas para la actividad laboral de quien las recibe (a pesar de que son adecuadas para la gestión de casos urgentes [27]), la limitación en cuanto a espacio y tiempo de las consultorías presenciales, o la excesiva informalidad de las consultas de pasillo, sin posibilidad de acceso a la historia clínica del paciente.

Según diversos estudios, a pesar del aumento en el acceso a fuentes electrónicas de información, los médicos de AP suelen consultar sus dudas en primer lugar con otros colegas, siendo el acceso a internet la segunda opción [12,26,43,44]. No hay que olvidar que, según Gabbay, el acceso hacia la mejor práctica clínica posible fue, para los profesionales de AP, a través de sus redes profesionales con otros médicos. Rara vez usaron evidencia explícita directamente de fuentes formales, sino que confiaron en sus propias "guías mentales" construidas colectivamente e internalizadas tácitamente, y creadas mediante lecturas cortas y sobre todo interacciones informales con otros compañeros. Por tanto, la habilidad real del profesional se construye a través del aprendizaje de forma fiable del conocimiento que proviene de fuentes de confianza, ya sean individuales o a través de comunidades de práctica. El resultado es un práctica clínica diaria basada en un el conocimiento constituido por un grupo de personas [45].

3.2. La telemedicina

En los últimos años cada vez está más extendido el uso de la telemedicina. Se entiende como telemedicina la utilización de la TICs para la transferencia de la información médica con finalidades diagnósticas, terapéuticas y educativas [44]. Existen multitud de definiciones de telemedicina y la mayoría de ellas coinciden en una serie de características [46]. Por un lado, el alcance de las tecnologías utilizadas en la telemedicina es amplio en naturaleza y complejidad, y van desde las simples tecnologías de almacenamiento y reenvío basadas en correo electrónico hasta las complejas técnicas quirúrgicas remotas que emplean la robótica. Por otro lado, es una modalidad de prestación de atención médica que tiene la tecnología como uno de sus componentes principales, es decir, el canal para el intercambio de información médica, y que pretende salvar distancias entre individuos mediante el uso de las TICs.

Entre los sistemas de telemedicina, destacan el correo electrónico, las videoconferencias o las consultorías virtuales, o aquellos que hacen uso de herramientas web 2.0, como pueden ser las comunidades de práctica clínica. Según Horner, los diferentes métodos han sido ampliamente estudiados [33], concluyendo que son de fácil uso, precisan menos tiempo de dedicación que las consultas tradicionales, se obtiene una rápida respuesta, son altamente resolutivos y confiables, permiten que los médicos de AP se sientan más capacitados para manejar los pacientes por ellos mismos, son especialmente útiles en zonas rurales y países en desarrollo [47] y son menos disruptivos que las llamadas telefónicas [48]. También han demostrado disminuir el número de derivaciones a la AE (entre un 8,9% y un 51%) y las pruebas complementarias, reducir el tiempo de espera para la visita con el especialista y mejorar la atención médica, con el consiguiente ahorro económico (en visitas a especialistas y desplazamientos del paciente) [16,33,47,49–56], así como mejorar la comunicación entre los dos niveles asistenciales [57–59]. En Catalunya existe un observatorio de experiencias de telemedicina disponible en http://www.ticsalut.cat/observatori/.

Se han detectado una serie de elementos facilitadores a la hora de adoptar una herramienta de telemedicina por parte de los profesionales sanitarios [60]: que responda a una necesidad claramente percibida por los mismos, que el núcleo del liderazgo incorpore a clínicos que tenga en cuenta las necesidades de los profesionales y que desde el diseño inicial se establezca una estrategia para la sostenibilidad y normalización de la herramienta.

Por otro lado, la mayor problemática que tienen las teleconsultas es su uso limitado por parte de los profesionales, que podría aumentar en la medida que mejore la confianza con la tecnología y con las visitas no presenciales [33], con la aplicación de incentivos para el médico especialista y al disponer de un tiempo reservado para dedicarse a ellas. Asimismo, se detectan numerosas barreras que dificultan la correcta implementación: cuestiones organizativas (necesidad de formación, rediseño del modelo asistencial, redefinición de roles, necesidad de inclusión en la cartera de servicios de la administración autonómica), tecnológicas (interfaz poco amigable, necesidad de formación), humanas (resistencia al cambio, competencia individual en informática, creencias previas respecto a la telemedicina, carga de trabajo, preferencia de los pacientes por la visita presencial), y económicas (no hay un reembolso por la actividad asistencial prestada mediante telemedicina si ésta no está incluida en la cartera de servicios de la administración sanitaria) [59,61–63]. De todas formas, las teleconsultas nunca reemplazarán por completo las llamadas telefónicas (muy útiles para cuestiones urgentes) o las conversaciones informales, aunque pueden ser muy útiles para especialistas que dan consejos de manejo en lugar de practicar procedimientos, o en patologías que se basan más en datos de laboratorio que en el examen físico [33].

Se han desarrollado muchos proyectos que en sus fases de prueba han mostrado buenos resultados clínicos y de coste-efectividad, pero que no han conseguido integrarse y dentro de la práctica médica habitual [64,65].

3.3. La Web 2.0 y las Comunidades de Práctica

El término Web 2.0 fue acuñado por el americano Dale Dougherty de la editorial O'Reilly Media durante el desarrollo de una conferencia en el año 2004. Esta denominación surgió para referirse a nuevos sitios web que se diferenciaban de aquellos más tradicionales englobados bajo la denominación Web 1.0. La característica diferencial es la participación colaborativa de los usuarios. En el año 2005, Tim O'Reilly definió y ejemplificó el concepto: “Web 2.0 es la red como plataforma, extendiéndose a todos los dispositivos conectados: las aplicaciones Web 2.0 son aquellas que utilizan lo mejor de las ventajas intrínsecas de dicha plataforma: distribuyendo software como un servicio constantemente actualizado que es mejor cuanto más gente lo utiliza, consumiendo y remezclando datos de múltiples fuentes incluyendo usuarios individuales, mientras proporcionan sus propios datos y servicios de manera que permiten a otros remezclarlos, creando efectos de red a través de una ‘arquitectura de participación’”[66].

Así, la Web 2.0 (también conocida como web social o web participativa) se refiere a los sitios web que se caracterizan por los contenidos generados por los propios usuarios, la facilidad de uso, la cultura de participación y la interoperabilidad (compatible con otros productos, sistemas y dispositivos) para los usuarios finales. Esto contrasta con la primera generación de sitios web 1.0, donde los usuarios estaban limitados a visualizar los contenidos de una manera pasiva [67]. Ejemplos de Web 2.0 incluyen, entre otros, las redes sociales (p.e. Facebook), blogs, wikis, folksonomías (etiquetar con palabras en las páginas web o los enlaces), sitios de intercambios de vídeos (p.e. YouTube), aplicaciones web (“apps”) y comunidades de práctica virtuales.

Por tanto, la web 2.0 se caracteriza por la participación y la colaboración entre los usuarios de internet, que dejan de ser simples consumidores de información que otros crean para ellos, para ser los propios creadores de los contenidos. Por tanto, no se trata de una nueva tecnología en sí misma, sino de la aplicación de un conjunto de herramientas de software presentes en internet que son gratuitas y fáciles de utilizar a través únicamente del navegador [66,68,69]. Las características de la creación de contenidos mediante la Web 2.0 son: la libre contribución de todo usuario de Internet que quiera ofrecer su conocimiento, la compartición del mismo con otros usuarios que tengan permisos para acceder, la colaboración a la creación del contenido entre todos los usuarios (posible interacción social mediante conversaciones entre los participantes) y la actualización constante de los contenidos que refleja el entorno cambiante y la confianza entre los proveedores de contenidos y los expertos en el tema [70]. Aunque es habitual el uso de Internet para búsqueda de información por parte de los profesionales sanitarios a través de enlaces en documentos (web 1.0), no lo es tanto hacer uso de herramientas web 2.0 para acceder a información relacionada con la salud por parte de estos mismos profesionales [71].

Aplicada al ámbito de la medicina, el uso de las redes sociales puede ser visto como un método eficiente y eficaz para obtener una formación actualizada y compartir conocimientos con otros médicos dentro de la comunidad y mejorar así la atención al paciente.

El conocimiento en áreas específicas ya no está proporcionado sólo por expertos en el tema mediante un repositorio centralizado, sino también por otros compañeros que poseen las mismas capacidades, y a las que se accede mediante una comunicación interactiva y colaborativa a través de comunidades virtuales en internet, o comunidades de práctica (CoP). Estas son grupos de personas que están interesadas en los mismos temas y comparten una tarea común en el mismo plazo de tiempo, aunque no compartan la ubicación geográfica, y aprenden a hacerlo mejor mediante la interacción regular [70,72,73]. Aplicadas al ámbito sanitario, las llamadas CoP clínicas (CoPC) son plataformas online que aprovechan las ventajas de la Web 2.0 para construir conocimiento entre los profesionales sanitarios de diferentes niveles asistenciales [45]. Las CoPC ofrecen a los médicos nuevos métodos de descubrimiento de información que superan las limitaciones de otros sistema de búsqueda como Medline, que a pesar de todos sus beneficios ya no es un mapa suficientemente detallado de la literatura médica [68,74]. Así, los médicos noveles aprenden mediante la interacción con los expertos, que a su vez también pueden adquirir conocimientos, y además se crea un conocimiento disponible para la comunidad a lo largo del tiempo [75–77]. Con el tiempo, la acumulación de experiencias aumentará no sólo el conocimiento explícito del grupo (documentos escritos, planes de cuidados estandarizados), sino también su conocimiento tácito o práctico, que emerge a través de la práctica reflexiva y la recopilación y el intercambio de casos entre los profesionales. Esto es especialmente importante en pacientes de AP, con multimorbilidad, porque la atención a estos pacientes requiere flexibilidad y coordinación permanente, ya que a menudo se debe adaptar a las circunstancias individuales [73].

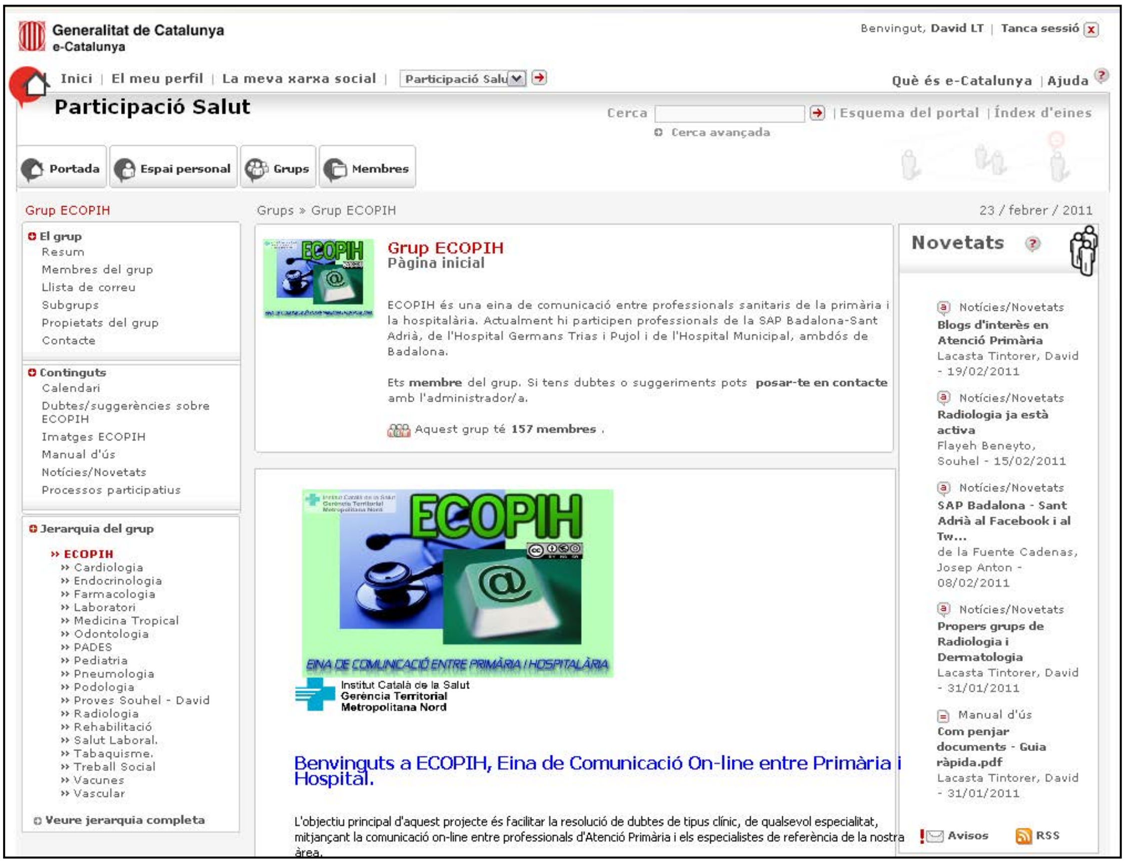
Aunque la evidencia que demuestra su utilidad es más limitada [78,79], estas comunidades virtuales han mostrado una gran capacidad para transferir los conocimientos adquiridos a la práctica clínica diaria [80–82] así como un gran potencial a nivel formativo [79,83–86]. Además, las CoP virtuales pueden ayudar a evitar el aislamiento de médicos generales en formación que trabajan en zonas rurales o aisladas, así como superar factores como la escasez de personal y mejorar la calidad de la atención que se ofrece en estas áreas, incluso en países en desarrollo [68,76,87–89].

Diferentes estudios han analizado los factores que condicionan un mayor y menor uso de las redes sociales en general y de las CoP en concreto, según el Modelo de Aceptación de la Tecnología (TAM, Technology Acceptance Model) [90]. Según McGowan, los factores que determinan un mayor uso de una nueva tecnología por parte de la comunidad son la percepción de utilidad de la misma y la facilidad de uso. Por otro lado, los factores que suponen una barrera para la adopción son el tiempo y la seguridad o privacidad de los datos [79,91].

Es necesario conocer más datos acerca de la implementación de las herramientas de telemedicina, su efectividad y sus costes, tanto de las experiencias exitosas como las que no lo han sido, y preferentemente en nuestro sistema de salud [33,60,92–95], ya que la evidencia científica de la que disponemos presenta un conjunto de problemas recurrente: tamaños de muestra reducidos, inexistencia de grupos de control, proyectos de corta duración con poca capacidad de análisis sobre el uso sistemático, dificultades en el cálculo de costes... [96]. Además, puede ser necesario abordar la evaluación a partir de un conjunto de principios que la entienda como una práctica social más que como un estricto test científico, incluyendo así los estudios cualitativos [97,98].

3.4. La plataforma ECOPIH

En el año 2009 fue creada ECOPIH (del acrónimo en lengua catalana: “Eina de Comunicació Online entre Primària i Hospital”, en español: “Herramienta de Comunicación Online entre Primaria y Hospital“), que es una CoPC que usa una plataforma Web 2.0 para la comunicación entre profesionales sanitarios de centros de AP y especialistas de diversos hospitales, en Badalona y Sant Adrià de Besós (dos ciudades en el área metropolitana de Barcelona, España) [99,100]. Mediante esta plataforma, los profesionales de AP de un área sanitaria pueden consultar las dudas relativas a un total de 31 especialidades (ver figura 1).


Generalitat de Catalunya
e-Catalunya
Benvingut, David LT | Tanca sessió
Inici | El meu perfil | La meva xarxa social | Participació Salu
Què és e-Catalunya | Ajuda
Participació Salut
Cerca
| Esquema del portal | Índex d'eines
Cerca avançada
Portada
Espai personal
Grups
Membres
Grup ECOPIH
Grups » Grup ECOPIH
23 / febrer / 2011
El grup
Resum
Membres del grup
Llista de correu
Subgrups
Propietats del grup
Contacte
Continguts
Calendari
Dubtes/suggerències sobre ECOPIH
Imatges ECOPIH
Manual d'ús
Notícies/Novetats
Processos participatius
Jerarquia del grup
» ECOPIH
» Cardiologia
» Endocrinologia
» Farmacologia
» Laboratori
» Medicina Tropical
» Odontologia
» PADES
» Pediatria
» Pneumologia
» Podologia
» Proves Souhel - David
» Radiologia
» Rehabilitació
» Salut Laboral.
» Tabaquisme.
» Treball Social
» Vacunes
» Vascular
Veure jerarquia completa
ECOPIH
EINA DE COMUNICACIÓ ENTRE PRIMÀRIA I HOSPITALÀRIA
Institut Català de la Salut
Gerència Territorial
Metropolitana Nord
Novetats
Avisos
RSS

Grup ECOPIH
Pàgina inicial

ECOPIH és una eina de comunicació entre professionals sanitaris de la primària i la hospitalària. Actualment hi participen professionals de la SAP Badalona-Sant Adrià, de l'Hospital Germans Trias i Pujol i de l'Hospital Municipal, ambdós de Badalona.

Ets **membre** del grup. Si tens dubtes o suggeriments pots **posar-te en contacte** amb l'administrador/a.

Aquest grup té **157 membres** .

Benvinguts a ECOPIH, Eina de Comunicació On-line entre Primària i Hospital.

L'objectiu principal d'aquest projecte és facilitar la resolució de dubtes de tipus clínic, de qualsevol especialitat, mitjançant la comunicació on-line entre professionals d'Atenció Primària i els especialistes de referència de la nostra àrea.

Notícies/Novetats
Blogs d'interès en Atenció Primària
Lacasta Tintorer, David - 19/02/2011

Notícies/Novetats
Radiologia ja està activa
Flayeh Beneyto, Souhel - 15/02/2011

Notícies/Novetats
SAP Badalona - Sant Adrià al Facebook i al Tw...
de la Fuente Cadenas, Josep Anton - 08/02/2011

Notícies/Novetats
Propers grups de Radiologia i Dermatologia
Lacasta Tintorer, David - 31/01/2011

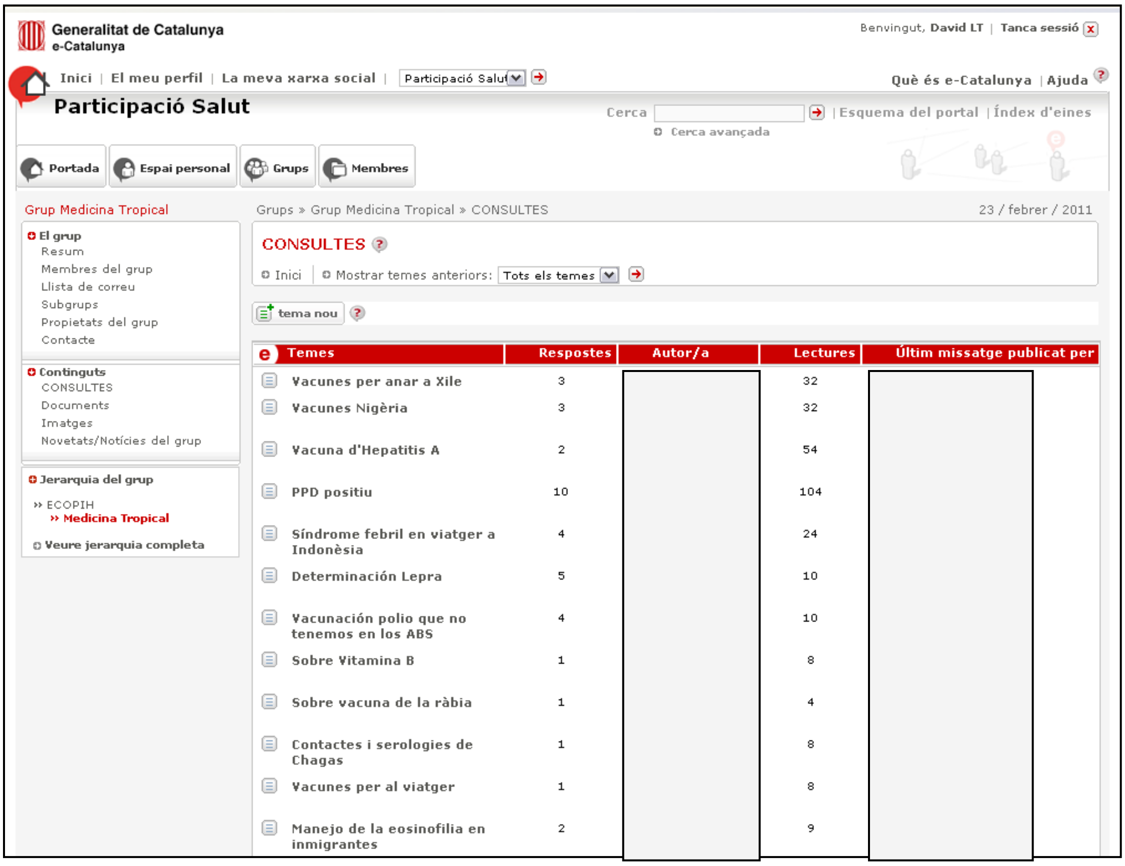
Manual d'ús
Com penjar documents - Guia ràpida.pdf
Lacasta Tintorer, David - 31/01/2011

Figura 1. Captura de pantalla de la página inicial de la plataforma ECOPIH

Como gestor de contenidos se usó la plataforma e-Catalunya, que dispone de las siguientes herramientas:

- Fórum (Figura 2). Se plantea una pregunta y todos los miembros de la comunidad pueden leer tanto la pregunta como la respuesta y participar en la discusión del caso. Los casos quedan abiertos, de forma que pueden ser actualizados a lo largo del tiempo, así como ser consultados con posterioridad.
- Repositorio de imágenes. Para complementar la información de una consulta (imagen radiológica, electrocardiograma, fotografía de una úlcera o lesión cutánea…).
- Repositorio de documentos. Utilizado habitualmente para complementar la respuesta con su correspondiente fuente bibliográfica o documento explicativo.

- Blog. Se pueden hacer recomendaciones, difusión de enlaces de internet, documentos de interés, jornadas de formación…).


Generalitat de Catalunya
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Cerca
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Cerca avançada
Portada
Espai personal
Grups
Membres
Grup Medicina Tropical
El grup
Resum
Membres del grup
Llista de correu
Subgrups
Propietats del grup
Contacte
Continguts
CONSULTES
Documents
Imatges
Novetats/Notícies del grup
Jerarquia del grup
» ECOPIH
» Medicina Tropical
Veure jerarquia completa
Inici
Mostrar temes anteriors: Tots els temes
tema nou

Grups » Grup Medicina Tropical » CONSULTES 23 / febrer / 2011

CONSULTES

Temes	Respostes	Autor/a	Lectures	Últim missatge publicat per
Vacunes per anar a Xile	3	[redacted]	32	[redacted]
Vacunes Nigèria	3	[redacted]	32	[redacted]
Vacuna d'Hepatitis A	2	[redacted]	54	[redacted]
PPD positiu	10	[redacted]	104	[redacted]
Síndrome febril en viatger a Indonèsia	4	[redacted]	24	[redacted]
Determinación Lepra	5	[redacted]	10	[redacted]
Vacunación polio que no tenemos en los ABS	4	[redacted]	10	[redacted]
Sobre Vitamina B	1	[redacted]	8	[redacted]
Sobre vacuna de la ràbia	1	[redacted]	4	[redacted]
Contactes i serologies de Chagas	1	[redacted]	8	[redacted]
Vacunes per al viatger	1	[redacted]	8	[redacted]
Manejo de la eosinofilia en inmigrantes	2	[redacted]	9	[redacted]

Figura 2. Captura de pantalla de la sección de Consultas de la plataforma ECOPIH

e-Catalunya es un sistema de información ofrecido por la Generalitat de Catalunya y usado con éxito durante los últimos 15 años para dar soporte a las necesidades de colaboración y compartición de conocimiento de empleados públicos, profesionales y ciudadanos, organizados en CoP vinculadas a la prestación de servicios públicos o a proyectos internos o externos que se alinean con las políticas públicas. Es una plataforma enfocada a la colaboración y compartición de conocimiento a través de las fronteras organizativas en un entorno seguro [101].

Las normas de utilización de ECOPIH son preservar la confidencialidad del paciente, de forma que no se pueden incorporar datos que permitan identificarlos; registrarse en la plataforma, con aceptación por parte de los administradores de la misma, aportando nombre, apellidos, especialidad y centro de trabajo; y mantener exento de responsabilidad al profesional especialista, mientras el paciente no sea derivado. Los creadores y administradores de la plataforma velan por el cumplimiento de estas normas.

Tras dos años de seguimiento (2011-2012), ECOPIH reporta que se realizaron más de 1000 intervenciones en las seis especialidades, que conllevaron más de 12200 lecturas (aproximadamente se obtuvieron 10 lecturas por cada aportación) y se realizaron 209 consultas de casos clínicos en estas tres especialidades. Estos datos son similares a los obtenidos en los análisis de otras CoP [102], sin olvidar a los participantes observadores o lectores que también se benefician del conocimiento de los expertos ("legitimate peripheral participants") [103,104]. En el Anexo 1 se detalla la actividad realizada en la plataforma en cada una de las especialidades disponibles durante los dos años de estudio, y en el Anexo 2 se muestra la actividad de todas las especialidades de ECOPIH desde su inicio hasta la actualidad.

Después de varios años de seguimiento, el estudio de ECOPIH permitiría conocer los resultados de la implementación de un sistema de consultoría entre niveles asistenciales mediante una CoPC, a largo plazo y en un entorno real, y detectar así su impacto en la actividad asistencial de los profesionales de AP y AE de una forma realista. Con el objetivo de obtener una información más global, que reflejase el impacto de esta plataforma desde diferentes perspectivas, se llevó a cabo un análisis mixto. Por un lado, se realizó un estudio cuantitativo que pretendía evaluar la disminución de derivaciones de los usuarios de ECOPIH [99]; y por otro, un estudio cualitativo que abordaría este mismo aspecto desde la visión subjetiva de los profesionales, así como otros puntos de interés como la calidad de las derivaciones, su impacto a nivel formativo, la satisfacción laboral, la comunicación entre niveles asistenciales y también sus limitaciones en su uso.

4. Hipótesis

La utilización de la herramienta telemática ECOPIH en la comunicación entre profesionales de AP y AE supone una reducción significativa en el número de derivaciones de AP hacia AE, y su estudio en profundidad permitiría conocer el perfil de los profesionales usuarios y determinar las características ideales que debería tener una herramienta de consultoría online entre profesionales.

5. Objetivos

5.1. Objetivo principal

Determinar si el uso de la plataforma ECOPIH reduce el número de derivaciones de pacientes que el médico de AP realiza hacia AE en las especialidades de Cardiología, Endocrinología, Gastroenterología, Nefrología, Neumología y Neurología.

5.2. Objetivos secundarios

1. Establecer cuáles son los factores determinantes que influyen en la intención de utilizar ECOPIH entre los profesionales de AP.
2. Determinar la fidelización de los usuarios, medida a través de la utilización continuada de la herramienta ECOPIH a lo largo del tiempo.
3. Conocer las opiniones de los profesionales sanitarios sobre la utilidad de las CoPC en relación con la disminución de las derivaciones entre niveles asistenciales y otros aspectos relacionados con la práctica clínica diaria.
4. Analizar cuáles son las claves del éxito de una CoP clínica para su uso en la práctica clínica diaria.

6. Contribuciones

6.1. Presentación de las contribuciones

La investigación desarrollada a lo largo de esta tesis doctoral se ha concretado en cuatro trabajos publicados en dos revistas de ámbito internacional, una de ellas indexada en el segundo cuartil en la categoría Primary Health Care de la publicación Journal Citation Reports (JCR), y la otra indexada en el tercer cuartil de la categoría Health Care Sciences and Services (Tabla 1). Las revistas fueron escogidas a partir de la temática, priorizando aquellas centradas en aspectos relativos a la Atención Primaria y/o la implementación de nuevas tecnologías en la práctica clínica, y que preferiblemente fueran de acceso abierto.

La observación en conjunto de todos los artículos publicados sigue un hilo argumental que ofrece una visión global sobre el tema motivo de la investigación.

La **Contribución número 1** [99] consistió en la publicación del protocolo del estudio, con el objetivo de dar a conocer a la comunidad científica la herramienta que estaba a punto de implementarse en el territorio, explicar cuáles eran los beneficios que se esperaba obtener en términos de eficiencia y cómo se pretendía evaluar este impacto, y destacar los aspectos diferenciales respecto a otras investigaciones similares. La novedosa utilización de una plataforma colaborativa destinada a consultar casos y compartir conocimiento entre profesionales de AP y AE, podía disminuir el número de derivaciones que se realizaban desde AP hacia el segundo nivel asistencial, y este era el objetivo principal del trabajo. Con tal fin se diseñó un estudio abierto, multicéntrico, controlado, no aleatorio y de dos años de duración, a través del cual se calcularían las derivaciones realizadas por usuarios y no usuarios de ECOPIH antes y después de 2 años de seguimiento. También se esperaba observar diferencias en las derivaciones realizadas en función de la frecuencia de uso de la herramienta. Se esperaba, asimismo, que este efecto se observara tanto en los participantes activos en la plataforma como, en menor medida, en los que tan sólo eran lectores de los contenidos. Este trabajo era innovador en cuanto a su metodología, puesto que no se encontró ningún estudio previo que evaluase una herramienta colaborativa destinada a la comunicación entre niveles asistenciales, en un entorno real no controlado y durante un período largo de seguimiento.

Más adelante se publicó la **Contribución número 2** [105] en la cual se analizaron, mediante la aplicación del Modelo de Aceptación Tecnológica modificado, los factores discriminantes que determinaban el uso de una CoPC por parte de los profesionales sanitarios (médicos/as y enfermeros/as). Se contrastaron los siguientes supuestos:

1. La percepción de utilidad de ECOPIH influye sobre la intención de uso de la plataforma (1.1. mejora de la práctica clínica; 1.2. reducción de costes).
2. La percepción de facilidad de uso de ECOPIH influye sobre la intención de uso de la plataforma.
3. La percepción de seguridad y confidencialidad de ECOPIH influye sobre la intención de uso.
4. El perfil de uso de las TICs influye sobre la intención de uso (4.1. dispositivos móviles; 4.2. redes sociales).

Para comprender los efectos del uso clínico de las CoP en los resultados de salud, era crucial realizar un análisis para determinar qué factores explicaban el uso de las CoPC por parte de los médicos. Obtener y comparar esta evidencia representaba una contribución importante a la literatura, en el sentido que permitiría evaluar los determinantes del uso clínico de las CoP.

Más adelante se llevó a cabo el trabajo que daría lugar a la **Contribución número 3** [106]. En él se diseñó un estudio cualitativo en el cual, mediante la realización de dos grupos focales, tres grupos triangulares y cinco entrevistas individuales, se recogieron las opiniones y experiencias de 29 usuarios y no usuarios de ECOPIH. El objetivo de este artículo era explorar las opiniones de los profesionales de la salud sobre los CoCP y los cambios que debían realizarse en el entorno habitual de la práctica profesional. Con base en sus experiencias con ECOPIH y en sus puntos de vista, se analizaron las características que deberían contribuir a la mayor disposición de los profesionales de la salud para usar la CoCP, así como los cambios que debían hacerse para que pudiesen integrarlo en su práctica clínica diaria.

Finalmente, desarrollamos la investigación que concluyó con la **Contribución número 4** [107]**.** Este último y definitivo trabajo consistía en un doble estudio. Por un lado, se analizaron los perfiles de los usuarios de ECOPIH durante la fase de implementación y de consolidación (dos años más tarde). Con ello se pretendía evaluar el grado de fidelidad de los usuarios. Por otro lado, basándose en los factores discriminantes de uso por parte de los médicos durante la fase de implementación, se comprobó si, efectivamente, se observaba una disminución del número de derivaciones desde AP al siguiente nivel asistencial, registradas en bases de datos oficiales.

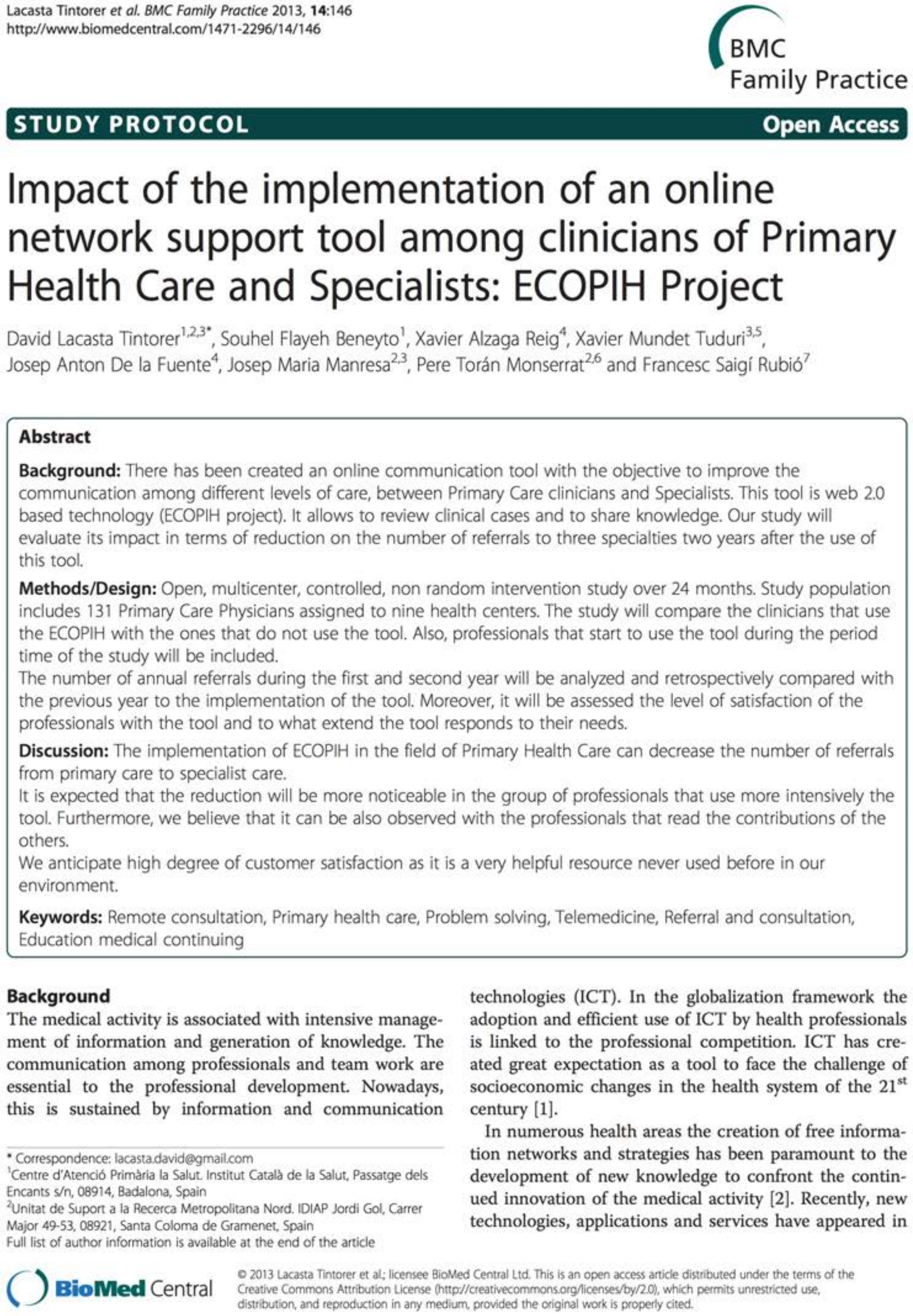
Tabla 1. Características de las contribuciones de la tesis doctoral

	Contribución 1	**Contribución 3**	**Contribución 4**	**Contribución 5**
Título	Impact of the implementation of an online network support tool among clinicians of primary health care and specialists: ECOPIH Project	Understanding the discriminant factors that influence the adoption and use of clinical communities of practice: the ECOPIH case	Keys to success of a community of clinical practice in primary care: a qualitative evaluation of the ECOPIH project	Efficiency as a determinant of loyalty among users of a Community of Clinical Practice: A comparative study between the implementation and consolidation phases
Revista	BMC Family Practice	BMC Health Services Research	BMC Family Practice	BMC Family Practice
Año	2013	2015	2018	2020
Índice y cuartil	JCR: 1,735. Q2 en Primary Health Care	JCR: 1,606. Q3 en Health Care Sciences and Services	JCR: 2.431. Q2 en Primary Health Care	JCR: 2.431 (2018). Q2 en Primary Health Care
Citaciones (SCI/SSCI)	3	2	4	1
Objetivo del estudio	Evaluar el impacto de la ECOPIH en el número de derivaciones desde un área de AP a la AE de Cardiología, Endocrinología y Gastroenterología	Describir los factores que explican el uso de una CoPC por parte de los profesionales sanitarios de AP	Conocer la visión de los profesionales sanitarios usuarios de la plataforma, y qué mejoras son necesarias	- Conocer el grado de fidelidad de los profesionales en el uso de ECOPIH. - Determinar si el uso de una CoPC tiene un impacto directo en el número de derivaciones desde AP a AE
Correspondencia con objetivos de tesis	Objetivo principal	Objetivo secundario 1	Objetivos secundarios 3 y 4	Objetivo secundario 2 y Objetivo principal
Metodología	Publicación del protocolo de investigación	Cuantitativa. Modelo de Aceptación de la Tecnología (TAM)	Cualitativa	Cuantitativa
Instrumentos	Análisis de registros oficiales	Encuesta	Entrevistas individuales, grupos triangulares y grupos focales	Encuesta. Análisis de registros oficiales
Muestra	507 médicos de AP	166 profesionales sanitarios	29 profesionales sanitarios	507 médicos de AP

6.2. Contribución 1. Impact of implementation of an online network support tool among clinicians of Primary Health Care and Specialists: ECOPIH Project.

Lacasta Tintorer D, Flayeh Beneyto S, Alzaga Reig X, Mundet Tuduri X, De la Fuente JA, Manresa JM, et al. Impact of the implementation of an online network support tool among clinicians of primary health care and specialists: ECOPIH Project. BMC Fam Pract 2013;14:146. doi:10.1186/1471-2296-14-146.

Índex Journal Citation Reports 2016: 1,735. Q2 en Primary Health Care.



Lacasta Tintorer *et al. BMC Family Practice* 2013, **14**:146
http://www.biomedcentral.com/1471-2296/14/146

BMC
Family Practice

STUDY PROTOCOL **Open Access**

Impact of the implementation of an online network support tool among clinicians of Primary Health Care and Specialists: ECOPIH Project

David Lacasta Tintorer[1,2,3*], Souhel Flayeh Beneyto[1], Xavier Alzaga Reig[4], Xavier Mundet Tuduri[3,5], Josep Anton De la Fuente[4], Josep Maria Manresa[2,3], Pere Torán Monserrat[2,6] and Francesc Saigí Rubió[7]

Abstract

Background: There has been created an online communication tool with the objective to improve the communication among different levels of care, between Primary Care clinicians and Specialists. This tool is web 2.0 based technology (ECOPIH project). It allows to review clinical cases and to share knowledge. Our study will evaluate its impact in terms of reduction on the number of referrals to three specialties two years after the use of this tool.

Methods/Design: Open, multicenter, controlled, non random intervention study over 24 months. Study population includes 131 Primary Care Physicians assigned to nine health centers. The study will compare the clinicians that use the ECOPIH with the ones that do not use the tool. Also, professionals that start to use the tool during the period time of the study will be included.

The number of annual referrals during the first and second year will be analyzed and retrospectively compared with the previous year to the implementation of the tool. Moreover, it will be assessed the level of satisfaction of the professionals with the tool and to what extend the tool responds to their needs.

Discussion: The implementation of ECOPIH in the field of Primary Health Care can decrease the number of referrals from primary care to specialist care.

It is expected that the reduction will be more noticeable in the group of professionals that use more intensively the tool. Furthermore, we believe that it can be also observed with the professionals that read the contributions of the others.

We anticipate high degree of customer satisfaction as it is a very helpful resource never used before in our environment.

Keywords: Remote consultation, Primary health care, Problem solving, Telemedicine, Referral and consultation, Education medical continuing

Background

The medical activity is associated with intensive management of information and generation of knowledge. The communication among professionals and team work are essential to the professional development. Nowadays, this is sustained by information and communication technologies (ICT). In the globalization framework the adoption and efficient use of ICT by health professionals is linked to the professional competition. ICT has created great expectation as a tool to face the challenge of socioeconomic changes in the health system of the 21st century [1].

In numerous health areas the creation of free information networks and strategies has been paramount to the development of new knowledge to confront the continued innovation of the medical activity [2]. Recently, new technologies, applications and services have appeared in

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Internet. They are Web 2,0 elements that go for creativity, apomediation, aggregation and share of information (not only for scientists) and collaboration through social networks, wikis or blogs among others. Internet users, geographically scattered, are organized around communities of common interests giving room to non-formal or unregulated learning.

In everyday clinical activity primary health care doctors face numerous uncertainties, between 0,7 and 18,5 questions per 10 patients [3]. Clinical sessions and individual conversations (in person and over the phone), together with specialist care, are options that allow such issues to be resolved. On the other hand, the learning capacity of doctors improves when they confront real problems in their daily activity that do not represent long time investment [3,4]. Given that the health system is at saturation point, communication between primary and specialist care is not easy, quick or effective, and it leads to many referrals to specialist care (hospitalisation or specialist consultations) that generally entail excessive delays for appointments [5].

Given these communication difficulties [6], several telemedicine approaches have been tried out in recent years. Of these, e-mail and videoconferencing [5,7,8] have proven to be of particular benefit in terms of efficiency, cost-effectiveness and improved medical care [9]. A number of studies that have assessed healthcare professionals' levels of satisfaction with the use of telemedicine platforms applied to information and communication have produced good results in terms of improved medical care and use of time [10-12].

Newer still is the creation of communities of practice in the field of healthcare [13]. These are online platforms that draw on the advantages of Web 2.0 to build knowledge among healthcare professionals working at different levels of care [14]. These virtual communities have proven capable of solving healthcare professionals' information and communication problems in a much simpler way. Moreover, they have been found to improve the functioning of organisations [13] by generating the kind of tacit knowledge that emerges from interactions among colleagues [14,15].

We could not find any study that assesses this issue at the level of a primary care area and its different health centers in the long run. On the other hand, the effectiveness of Community of Practice (CoP) on the functioning of health organizations has not been evaluated in a proper way [16].

Due to the expansion and emerging interest that ICT has generated in the society, ECOPIH project (Online Communication Tool Between Primary and Hospital Care) was created. It lies in the design and implementation of a virtual network with web 2.0 technology that allows interaction and communication among health professionals (doctors and nurses) of primary care and specialist care (Figure 1). Our aim is to design a study that assesses the efficacy of this tool to decrease referrals from primary care to specialist care and hospitals.

Methods/Design

Hypothesis

1st Hypothesis

Primary care professionals confront more everyday with patients with multiple pathologies and chronic processes. This has dramatically increased the complexity of health care. They are supported by specialist care through hospitalization or referral to the specialist consultation. The implementation of ICT tool ECOPIH with fluid flow of information between the two levels of care and promoting the creation of virtual communities would decrease significantly the number of referrals from primary care to the clinical specialties of Cardiology, Endocrinology and Gastroenterology.

2nd Hypothesis

The use of the ECOPIH tool would increase primary care clinician satisfaction and improve their ability to manage chronic patients.

Objectives

General objective

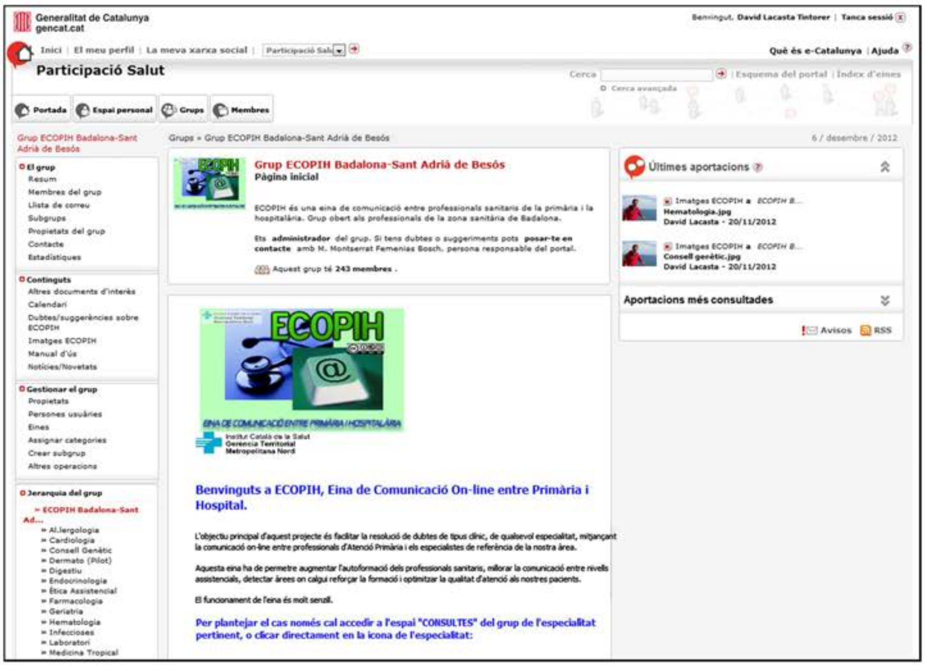
To assess the impact of the ECOPIH on the number of referrals from a primary health care area to the specialist care of Cardiology, Endocrinology and Gastroenterology.

Specific objectives

1. To compare the number of referrals from the primary care clinicians that use ECOPIH with the clinicians that do not use it.
2. To determine if there is a connection between the frequency on the use of the ECOPIH and the reduction of the referral rate for each clinician.
3. To evaluate the referral rate between the clinicians that inquiry about clinical cases with the clinicians that only consult their colleague's contributions.
4. To analyze the frequency of utilization of ECOPIH according to the different features of the participants: age, gender, health center, number of inquiries, number of contributions and number of clinical consultations.
5. To evaluate the level of satisfaction among clinicians using ECOPIH.

Design

Open, multicenter, controlled, non random intervention study over 24 months of follow up.


Generalitat de Catalunya
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Benvingut, David Lacasta Tintorer | Tanca sessió
Inici | El meu perfil | La meva xarxa social | Participació Sal
Què és e-Catalunya | Ajuda
Participació Salut
Cerca
Esquema del portal | Índex d'eines
Cerca avançada
Portada
Espai personal
Grups
Membres
Grup ECOPIH Badalona-Sant Adrià de Besós
El grup
Resum
Membres del grup
Llista de correu
Subgrups
Propietats del grup
Contacte
Estadístiques
Continguts
Altres documents d'interès
Calendari
Dubtes/suggerències sobre ECOPIH
Imatges ECOPIH
Manual d'ús
Notícies/Novetats
Gestionar el grup
Propietats
Persones usuàries
Eines
Assignar categories
Crear subgrup
Altres operacions
Jerarquia del grup
ECOPIH Badalona-Sant Ad...
Al.lergologia
Cardiologia
Consell Genètic
Dermato (Pilot)
Digestiu
Endocrinologia
Ètica Assistencial
Farmacologia
Geriatria
Hematologia
Infeccioses
Laboratori
Medicina Tropical
Grups » Grup ECOPIH Badalona-Sant Adrià de Besós
6 / desembre / 2012
ECOPIH
EINA DE COMUNICACIÓ ENTRE PRIMÀRIA I HOSPITALÀRIA
Institut Català de la Salut
Gerència Territorial
Metropolitana Nord
Últimes aportacions
Imatges ECOPIH a ECOPIH B...
Hematologia.jpg
David Lacasta - 20/11/2012
Imatges ECOPIH a ECOPIH B...
Consell genètic.jpg
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Aportacions més consultades
Avisos
RSS

Grup ECOPIH Badalona-Sant Adrià de Besós
Pàgina inicial

ECOPIH és una eina de comunicació entre professionals sanitaris de la primària i la hospitalària. Grup obert als professionals de la zona sanitària de Badalona.

Ets **administrador** del grup. Si tens dubtes o suggeriments pots **posar-te en contacte** amb M. Montserrat Femenias Bosch, persona responsable del portal.

Aquest grup té **243 membres** .

Benvinguts a ECOPIH, Eina de Comunicació On-line entre Primària i Hospital.

L'objectiu principal d'aquest projecte és facilitar la resolució de dubtes de tipus clínic, de qualsevol especialitat, mitjançant la comunicació on-line entre professionals d'Atenció Primària i els especialistes de referència de la nostra àrea.

Aquesta eina ha de permetre augmentar l'autoformació dels professionals sanitaris, millorar la comunicació entre nivells assistencials, detectar àrees on calgui reforçar la formació i optimitzar la qualitat d'atenció als nostres pacients.

El funcionament de l'eina és molt senzill.

Per plantejar el cas només cal accedir a l'espai "CONSULTES" del grup de l'especialitat pertinent, o clicar directament en la icona de l'especialitat:

Figure 1 Home page of ECOPIH.

The study will be carried out in a Health Service Area of Barcelona Province with 9 primary health care centers and 624 health staff that server 227.151 population. All clinicians of the Primary Care System will be analyzed (131 physicians). All facilities and staff belong to the public health system of Catalonia (Spain).

Inclusion criteria

Clinicians of the primary care area (SAP Badalona Sant Adrià) of the study that are working at least one year in the same health center.

Exclusion criteria

Pediatricians of primary care.

Other non-clinician staff.

Sample size

64 clinicians out of the 131 working in the area joined up the ECOPIH network since 1st July 2011 (ratio ECOPIH / non ECOPIH 0.955). Average referral rate per clinician is 33.5 (SD 8.0) per 100 patients that consulted in 2010. With a bilateral level of significance of 5% and power 80% a sample of 120 clinicians would allow to detect an interaction at 2 levels (ECOPIH / non-ECOPIH) with a minimum difference of 1.5977 units in a variance analysis for repeated measures, assuming a correlation coefficient between two times measures of 0.1 and a participants ratio (ECOPIH / non-ECOPIH) of 1:1, 2:1 or 3:1. (StudySize 2.0 was used for calculations) [17].

Evaluation of the ECOPIH platform

The ECOPIH project is a web 2.0-based virtual network that allows online interaction and communication among health professionals (physicians and nurses) from primary and specialist care. The tool is used to seek advice for clinical cases with the specialist. The inquires are available to all members of the network and they can contribute to the discussion. Also, it is possible to attach any document related to the issue that is considered of interest.

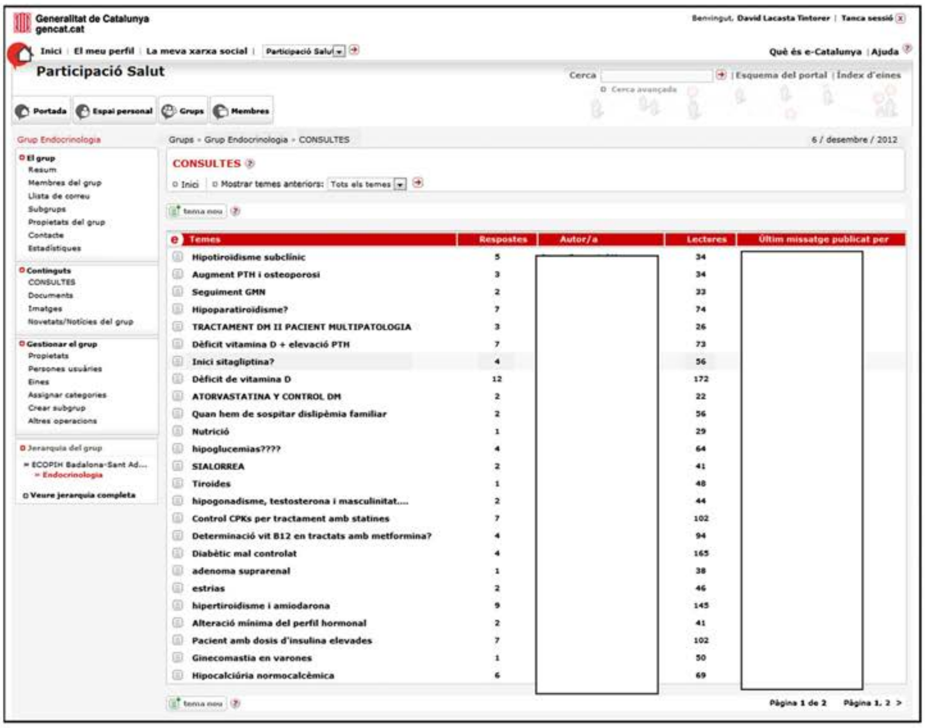
The platform e-Catalunya (http://ecatalunya.gencat.cat) was selected as Content Management System because offers directly a great number of applications, incremental deployment options and integration with well-known environments, which enables users to quickly share information and easy. It also lets you work with corporate level standards that provide security, privacy, management and integration into a stable platform and closed. It includes a forum ("Consultation"), a space to attach documents ("Documents") and images ("Images") and a blog ("News / Novelties") where everyone can add comments and get information about other groups. It also has a tool ("Participation") that allows to make surveys among participating members, as well as a calendar ("Calendar") and a tool for online document editing ("e-Wiki"). The platform has other features that were deactivated to simplify it use.

The mentioned platform is adapted to the particular needs of the network tool. When a clinician wants to inquire about a clinical case it has to write it in the forum providing protocols or bibliography about the case if necessary (Figure 2). Can also provide documents (Figure 3) that illustrate the case (photos, x-ray images, clinical reports, electrocardiograms). The referral specialist answers the issues raised and provides literature or clinical protocols that expand their response if necessary. The rest of the primary care members can read the documents and participate in the discussion as well as sharing documents or contributing to the blog. Participation of primary care clinicians and nurses is voluntary. Documents can be searched using various attributes and document content.

The head of each specialty department was contacted in order to present the project and to explain the role of the participant in the ECOPIH as a consultant (to reply queries and attach interesting documents) being important that the process does not take more than 48 hours.

With these contacts with the heads the specialties involved have increased substantially being nowadays 30 active specialties. Among them Cardiology, Palliative Care, Dermatology, Endocrinology, Pharmacology, Gastroenterology, Laboratory, Pneumology. It is expected to include all the surgical and medical specialties of the hospitals. That will represent an important contribution to the integration of different public institutions of the health sector.

Patient confidentiality is a key issue and it is taken into account to run ECOPIH. Only the age and gender will be recorded.


Generalitat de Catalunya
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Benvingut, David Lacasta Tintorer | Tanca sessió
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Cerca
Esquema del portal | Índex d'eines
Cerca avançada
Portada
Espai personal
Grups
Membres
Grup Endocrinologia
El grup
Resum
Membres del grup
Llista de correu
Subgrups
Propietats del grup
Contacte
Estadístiques
Continguts
CONSULTES
Documents
Imatges
Novetats/Notícies del grup
Gestionar el grup
Propietats
Persones usuàries
Eines
Assignar categories
Crear subgrup
Altres operacions
Jerarquia del grup
ECOPIH Badalona-Sant Ad...
Endocrinologia
Veure jerarquia completa
Grups » Grup Endocrinologia » CONSULTES
6 / desembre / 2012
CONSULTES
Inici
Mostrar temes anteriors: Tots els temes
tema nou
Pàgina 1 de 2
Pàgina 1, 2 >

Temes	Respostes	Autor/a	Lectures	Últim missatge publicat per
Hipotiroidisme subclínic	5	[redacted]	34	[redacted]
Augment PTH i osteoporosi	3	[redacted]	34	[redacted]
Seguiment GMN	2	[redacted]	33	[redacted]
Hipoparatiroïdisme?	7	[redacted]	74	[redacted]
TRACTAMENT DM II PACIENT MULTIPATOLOGIA	3	[redacted]	26	[redacted]
Dèficit vitamina D + elevació PTH	7	[redacted]	73	[redacted]
Inici sitagliptina?	4	[redacted]	56	[redacted]
Dèficit de vitamina D	12	[redacted]	172	[redacted]
ATORVASTATINA Y CONTROL DM	2	[redacted]	22	[redacted]
Quan hem de sospitar dislipèmia familiar	2	[redacted]	56	[redacted]
Nutrició	1	[redacted]	29	[redacted]
hipoglucemias????	4	[redacted]	64	[redacted]
SIALORREA	2	[redacted]	41	[redacted]
Tiroides	1	[redacted]	48	[redacted]
hipogonadisme, testosterona i masculinitat....	2	[redacted]	44	[redacted]
Control CPKs per tractament amb statines	7	[redacted]	102	[redacted]
Determinació vit B12 en tractats amb metformina?	4	[redacted]	94	[redacted]
Diabètic mal controlat	4	[redacted]	165	[redacted]
adenoma suprarenal	1	[redacted]	38	[redacted]
estrias	2	[redacted]	46	[redacted]
hipertiroidisme i amiodarona	9	[redacted]	145	[redacted]
Alteració mínima del perfil hormonal	2	[redacted]	41	[redacted]
Pacient amb dosis d'insulina elevades	7	[redacted]	102	[redacted]
Ginecomastia en varones	1	[redacted]	50	[redacted]
Hipocalciúria normocalcèmica	6	[redacted]	69	[redacted]

Figure 2 Consultations Forum.

– A specific anonymous questionnaire will be distributed to the participants to assess user satisfaction and whether the tool is user friendly.

Statistical analysis

It will be analyzed if there is a association between participating in the ECOPIH network and the evolution of the mean percentage of referrals by 100 visited patients. It will be considered a significant difference of 1.57 units. ANOVA Repeated Measures (One within factor) will be used to compare basal values (12 months before) with data obtained between 1 to 24 months after.

It is foreseen to do a descriptive analysis of the two group variables. Qualitative variables will be described in absolute and relative frequencies. Quantitative variables will include mean and standard deviation. If there is skewed distribution then median and quartiles will be used. Confidence interval will be 95%.

To compare proportions Pearson, Fisher or Chi square tests for lineal trend will be used. To compare quantitative variables t- Student test will be used for independent or paired data. In case of skewed distribution U Mann Whitney, Wilcoxon or McNemar tests will be used according to the conditions of application.

Level of significance will be $p \leq 0.05$. Statistical analyses will be performed using the SPSS v.18for Windows 18.0.

Ethics

Confidentiality will be preserved at all levels ensuring that professionals and patients will not be identified. From ECOPIH platform is not possible to access the medical history of patients. Information will be obtained from existing data and subject identifying information will be coded and anonymized. Consequently, there is no need for informed consent.

This project follows the national regulation (Spanish Law 14/2007, 3rd July, Biomedical Research) and International regulations for ethical issues (Helsinky and Tokio declarations). The features of the intervention exclude the study to meet the national regulations for clinical trials. On the other hand, confidentiality is guaranteed under the Personal Data Protection Law (15/1999, 13th December). All participants will be in-writing informed about their participation on the study. No information about the intervention will be provided to avoid bias.

The research protocol has been reviewed and approved by the Ethics Committee and Clinical Research of the Primary Care Research Institute IDIAP Jordi Gol (Barcelona, Spain).

Discussion

The inclusion of ICT in the field of health care, specifically applied to the communication among professionals at different levels of care, should improve better coordination among professionals and decrease the number of referrals from primary to specialist care. The integration of web 2.0 concept allows the community members to provide contents and to share knowledge improving the communication among professionals. Therefore their clinical practice improves by learning form others' experiences and updating their knowledge.

For this reason a tool has been designed to allow the discussion of clinical cases from more than 30 specialties. It is also a reservoir of documents and has a blog where information can be shared and updated.

ECOPIH enables the transmission of knowledge among health professionals to solve doubts regarding actual clinical situations and is also becoming a collaboration and continuous training to maintain updated knowledge. The project has raised much interest in other primary health care regions of Catalonia. A nearby region has already implemented it, and other two will do it the near future. The management of ECOPIH will be uniform in all regions but the everyday running will be independent as each region has its own reference specialists, except, for five specialties: Smoking, Ethics, Immunization/Vaccines, Ulcers and Podiatry that have the same references for overall Catalonia.

It's important to analyze the impact of the implementation of this kind of web 2.0 tools on the reduction of the number of referrals, as well as to assess the level of interest from the professionals to this technology and their preferences and opinions in order that they can be part of the tools commonly used in primary care.

There are some limitations to the study. There is the possibility that many professionals register to ECOPIH during the follow up period. We have foreseen the development of an "informative campaign" to attract all hesitant professionals that would decide to register later on. The analysis at 24 months will include clinicians with at least 12 months in the network. Furthermore, in the sample size calculation we foresee the participation ratio of ECOPIH / non- ECOPIH from 1:1 to 3:1.

It is highly unlikely that all clinicians register to ECOPIH network (it is voluntary). In this case the analysis would evaluate the whole clinician group and the clinicians according to the level of utilization of the network.

Could be the bias that professionals working with ECOPIH platform are people especially motivated by some aspect of clinical practice that makes their referrals to specialists be made in a differentiated manner. This bias would affect the analysis in this group. We have foreseen to analyze the reduction of referrals of each professional related to the ones before the implementation of the study. Hence, this possible bias would be controlled by the study design.

The number of referrals from a specific area can be affected by several factors like difficulty to request additional tests, long waiting lists or lack of time to use the tool. However this will affect both arms of the study and will be controlled by the analysis.

We foresee the following consequences of the intervention:

- To take advantage of the communication among clinicians incrementing the organization's knowledge.
- Better communication among professionals and optimization of the utilization of health resources.
- To include web 2.0 tools in daily practice of primary care professionals.
- To improve continuing medical training and clinical competence of practitioners to encourage self-learning based on problems linked to practice.

If it is confirmed that the implementation of a ECOPIH tool in a primary health care area will improve clinicians knowledge this will have repercussions on better care to patients. Patients would have virtual access to their cases. The improvement of the resolution of clinical cases at primary level will end on the reduction of the number of referrals. If the project confirms the expected results then we will have a collaborative working system among clinicians that will benefit at three axes: better quality of health care, better professional competency and empowerment, and finally improvement on the efficiency of the health system.

Therefore, we think that the obtained results will prove a valuable knowledge for a better planning and utilization of health resources and professional practice.

Abbreviations

CoP: Community of Practice; ECOPIH: Eina de Comunicació entre Primària i Hospitalària (Online Communication Tool between Primary and Hospital Care); ICT: Information and communication technologies; PCP: Primary care providers; PHC: Primary Health Care; SAP: Servei d'Atenció Primària (Primary Health Service Area).

Competing interests

The author(s) declare that they have no competing interests.

Authors' contributions

All the authors have had a substantial contribution to the research design and study protocol. DLT (ECOPIH Community Manager) is the coordinator of the investigation and has participated in the elaboration of the protocol of investigation and the writing of this article. Also involved in the collection and analysis of results. SFB (ECOPIH Community Manager) participation in the drafting of the study protocol, data collection and dissemination of results. FSR contributed to formulating the research question, study design, interpretation of results and drafting the article. Expert in telemedicine and health 2.0 tools XAR participation in the study design, literature search, interpretation and dissemination of results. Expert in Health 2.0 tools. XMT protocol design, interpretation of results, drafting the article. JAF methodology and protocol design, data manager, interpretation of results, drafting the article. JMM supervised the methodology of the protocol of investigation and will be responsible for the treatment of the data and statistical analysis. PTM contributed to formulating research question, study design, analysis and interpretation of results. All the authors have read, revised and approved the final manuscript.

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6.3. Contribución 2. Understanding the discriminant factors that influence the adoption and use of clinical communities of practice: the ECOPIH case.

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Understanding the discriminant factors that influence the adoption and use of clinical communities of practice: the ECOPIH case

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Abstract

Background: The aim of the study presented in this article is to analyse the discriminant factors that have an influence on the use of communities of practice by primary and specialist healthcare professionals (physicians and nurses) for information sharing. Obtaining evidence from an ex-ante analysis to determine what factors explain healthcare professionals' clinical community of practice use allows aspects of its use to be identified.

Methods: A theoretical model based on a modified technology acceptance model was used as the analysis tool, and a discriminant analysis was performed. An ad-hoc questionnaire was designed and sent to a study population of 357 professionals from the Badalona-Sant Adrià de Besòs Primary Care Service in Catalonia, Spain, which includes nine primary care centres and three specialist care centres. The study sample was formed by the 166 healthcare professionals who responded.

Results: The results revealed three main drivers for engagement in a CoP: First, for the whole sample, perceived usefulness for reducing costs associated with clinical practice was the factor with the greatest discriminant power that distinguished between users and non-users, followed by perceived usefulness for improving clinical practice quality, and lastly habitual social media website and application use. Turning to the two sub-samples of healthcare professions (physicians and nurses, respectively), we saw that the usefulness stemming from community of practice use changed. There were differences in the levels of motivation of healthcare professionals with regards to their engagement with CoP. While perceived usefulness for reducing costs associated with clinical practice was the main factor for the physicians, perceived usefulness of the Web 2.0 platform use for communication for improving clinical practice quality and perceived ease of use were the main factors for the nurses.

Conclusions: In the context of communities of practice, the perception of usefulness of Web 2.0 platform use for communication is determined by organisational, technological and social factors. Specifically, the position that professionals have within the healthcare structure and particularly the closer healthcare professionals' activity is to patients and their professional experience of using social networks and ICTs are crucial to explaining the use of such platforms. Public policies promoting Web 2.0 platform use for communication should therefore go beyond the purely technological dimension and consider other professional and social determinants.

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Background

In the current context of healthcare spending containment, the role of primary care (PC) is fundamental in preventing unnecessary referrals and reducing waiting lists [1–3], and experiencing long term conditions that are often complex with multiple co-morbidities. However, a characteristic feature of PC surgeries is that they have to attend to a high number of patients suffering from many different health problems, whose clinical complexity is considerable [3–6]. This means that healthcare professionals have to deal with several aspects at once, which may raise a multitude of issues in day-to-day clinical practice [7–10] that require an effective system to search for information and solve problems [11, 12].

Clinical sessions and individual conversations (in person and over the phone), together with specialist care, are options that allow such issues to be resolved. Given that the health system is at saturation point, communication between PC and specialist care is not easy, quick or effective, and it leads to many referrals to specialist care (hospitalisation or specialist outpatient consultations) that generally entail excessive delays for appointments [10, 13].

For some time now, several approaches that draw on the advantages that telemedicine offers with regard to improving communication between PC and specialist care have been tried out [14, 15], with significant benefits in terms of efficiency, cost-effectiveness and improved medical care [16]. Other studies that have assessed healthcare professionals' levels of satisfaction with the use of different telemedicine tools applied to communication have shown a high degree of confidence in terms of improved medical care and use of time [17–19]. Newer still is the creation of communities of practice (CoP) in the field of healthcare. These are described as a group of people who share an interest in a domain of human endeavour and engage in collective learning that creates bonds among them, sharing knowledge and solving problems in the process [20], and giving healthcare professionals working at different levels of care the chance to collaboratively build knowledge [21, 22]. These virtual communities have not only proven capable of solving problems in a much simpler way, but also of improving the functioning of organisations by generating the kind of tacit knowledge that emerges from interactions among colleagues [23].

In order to understand the effects of clinical CoPs use on health outcomes, it is crucial to analyse the prior step, that is to say, to perform an ex-ante analysis to determine what factors explain physicians' clinical Communities of Practice use. Obtaining and comparing this evidence represents an important contribution to the literature, in the sense that it will allow the determinants of clinical CoPs use to be evaluated.

The aim of this article is to analyse the discriminant factors that have an influence on the use of CoPs by PC and specialist healthcare professionals (physicians and nurses) for information sharing. To that end, it presents the use of the Web 2.0 Platform for Communication between PC and specialist care called ECOPIH, from the acronym in the Catalan language of "Eina de Comunicació Online entre Primària i Hospitalària" ("Online Communication Tool between Primary and Hospital Care" in English). It is a clinical CoP that includes healthcare professionals from PC centres and specialists from several hospitals in Badalona and Sant Adrià de Besòs (two cities in the Barcelona metropolitan area, Spain) and allows online interaction and communication among healthcare professionals from primary and specialist care to seek advice on clinical cases [24].

Methods

Hypothesis and model

The technology acceptance model (TAM) is the theoretical proposal most widely applied to research into the acceptance of new information technologies in the professional sphere [25–31]. In particular, the model has the capacity to robustly explain variance in the intention to use information and communication technologies (ICTs) and ICT use behaviour, taking into account the individual's perceptions of technology. Specifically, in the original model proposed at the end of 1980, these are [1] perceived usefulness and [2] perceived ease of use [32, 33]. According to Davis, perceived usefulness refers to the extent to which a person believes that using a particular system will improve his or her performance at work. Whereas perceived ease of use refers to the extent to which a person believes that using a particular system will render the effort to perform his or her tasks less arduous [25–28]. However, some studies conducted in the field of healthcare have shown that Information and Communication Technologies use has a two-fold usefulness. Firstly, it improves clinical practice quality [34, 35], and secondly, it reduces the economic, time and human costs associated with clinical practice [36, 37]. Thus, we propose the following hypothesis in relation to the influence that perceived usefulness has on use:

> *H1. The perceived usefulness of ECOPIH has an influence on the healthcare professional's intention to use it.*
>
> *H1.1. The perception of improved clinical practice quality has an influence on the healthcare professional's ECOPIH use.*
>
> *H1.2. The perception of reduced costs associated with clinical practice has an influence on the healthcare professional's ECOPIH use.*

Regarding the second variable, the TAM shows how the perceived ease of use of ICTs has a two-fold effect on the individual. Firstly, a greater intention to use technology; and secondly, greater perceived usefulness of it. In this respect, Davis et al. [26] argued that improved ease of use could be instrumental in contributing to an increase in medical professionals' efficiency. In this respect, the second hypothesis proposed is related to the influence of the ease of use of ECOPIH, and it is established in the following terms:

> *H2. The perceived ease of use of ECOPIH in clinical practice has an influence on the healthcare professional's use of it.*

Despite its widespread acceptance, this model has a series of limitations that mainly stem from the fact that it does not take the influence of other types of variables into account. Bagozzi [38] and Venkatesh et al. [39] underscored the need to increase the explanatory power of this model by incorporating additional variables. According to Davis, identifying variables like these in the TAM can increase the explanatory power of the system users' acceptance [27, 40]. This is particularly important to the development of TAMs in the field of healthcare, where the consideration of variables relating to information security and protection constitutes one of the main incentives for or barriers to technology acceptance [30, 40–42]. In this respect, the third hypothesis is proposed in the following terms:

> *H3. The perception of information security and confidentiality offered by ECOPIH use has an influence on the healthcare professional's use of it.*

Finally, it should be noted that healthcare professionals use ICTs in their professional and personal lives. As ICT users, they may have their preferences when it comes to using different digital devices and applications in their professional and personal lives. In this respect, social aspects [43] play a role in defining the ICT user profile, as do other circumstantial variables such as experience and training [44]. The development of mixed-approach models comprising elements that refer to both the user profile and to technology, such as Parasuraman's theory of technology readiness (TR) [45], allowed us to consider the need to incorporate elements that refer to the user profile and the user's relationship with ICTs. That is why we incorporated the healthcare professional's ICT user profile as an explanatory factor of his or her intention to use Information and Communication Technologies at an advanced level in his or her usual practice. In this respect, we propose the following hypothesis in relation to the influence of the healthcare professional's profile as an individual:

> *H4. The ICT user profile of the healthcare professional's – as an individual, in his or her personal life – has an influence on ECOPIH use.*
>
> *H4.1. The use of different mobile devices has an influence on ECOPIH use.*
>
> *H4.2. The use of different social media websites and applications has an influence on ECOPIH use.*

Figure 1 summarises the variables that foster ECOPIH use by the healthcare professionals (Fig. 1).

Data collection, empirical methodology and validation

As mentioned previously, this study assesses the Web 2.0 Platform for Communication between PC and specialist care (ECOPIH). It is a clinical CoP that uses the e-Catalunya platform (http://ecatalunya.gencat.cat) as its content management system. It enables users to share information quickly and easily due to its numerous applications, incremental deployment options and easy integration into well-known environments. A series of sub-groups have been created on the system (one for each active specialty). The following tools are available within each group: i) a forum where queries about clinical cases are raised for consultation; ii) a document repository and an image repository; iii) a blog where news that people want to share is published; iv) a calendar and a tool for online document editing [44]. The forum rules of use include respect for the confidentiality of the patient and the identification of the healthcare professional involved. Posts are not moderated prior to publication, though they are reviewed to ensure that they comply with the rules. The platform has a notification system that allows members to receive daily, weekly or monthly e-mails, containing updates on news available on ECOPIH [24].

The research presented in this article is the result of a collaboration between the Badalona-Sant Adrià de Besòs

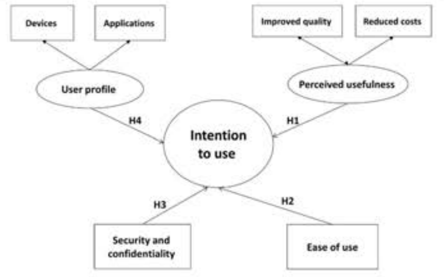


Fig. 1 Intention to use ECOPIH TAM

Primary Care Service (PCS) in Catalonia, Spain, and the Open University of Catalonia (UOC), Spain. The Badalona-Sant Adrià de Besòs PCS includes nine PC centres and three specialist care centres: Germans Trias i Pujol University Hospital, Badalona Municipal Hospital and the Barcelonès Nord International Health Unit, with a total of 624 healthcare professionals. These centres serve 227,151 inhabitants.

The data collection instrument used was an anonymous survey that included a combination of open and closed questions. The questionnaire was designed collaboratively by both organisations, and it was divided into three sections: 1) sociodemographic and professional background; b) access to and use of ICTs in professional and personal settings; and c) perceptions and use of ECOPIH. Two versions of the questionnaire were produced; one for PC professionals and another for specialist healthcare professionals. The questionnaires were anonymous and optional, and potential respondents were informed about the scientific objectives pursued and the confidentiality of data obtained.

An invitation to complete the questionnaire was sent by e-mail to 357 healthcare professionals bound by common practice in caring for the population of Badalona-Sant Adrià de Besòs PCS and who were regular users of ECOPIH. Among the 357 were 66 supply staff and resident physicians, and 89 specialist professionals could freely send the questionnaire to other colleagues. The questionnaire was completed by a total of 166 healthcare professionals, who formed the study sample and determined the overall response rate, which was 46.4 %, slightly lower than half of the eligible study population. The high response rate reflected by this percentage ensured that the sample was representative of the ECOPIH community population. This was also confirmed after analysing the sociodemographic profile of the individuals comprising the sample (see Table 2).

Likewise, the finite size of the population meant that it was possible to work with low margins of error (+5.6 %, 95 % confidence level), thus allowing the results obtained to be extrapolated.

The fieldwork was carried out between 1 December 2011 and 31 January 2012. Table 1 shows the study specifications. Table 2 shows the variables used in the study.

Table 1 Study specifications

Universe	
Universe	357 healthcare professionals
Sample	166
Margin of error	5.6 % ($p = q$) 95 % confidence level
Data collection method	Questionnaire
Sampling method	Random
Fieldwork	December 2011

The model described in section 1 presents the professional use of ECOPIH as a dependent variable. The rest of the model's variables are explanatory and act as independent variables in the model (see Table 2). It should be noted that the two variables used to measure perceived usefulness – *Perceived usefulness for improving clinical practice quality*, and *Perceived usefulness for reducing costs* – were obtained from principal component analysis. The multidimensional nature of these variables suggested that exploratory factor analysis (EFA) should be performed to calculate them. EFA is a data dimensionality reduction technique. Starting with the analysis of a set of original variables, it seeks to determine the smallest number of dimensions capable of explaining the maximum amount of information contained in the data [46].

In order to extract the factor dimensions, nine variables were considered in total. Each of them was related to the healthcare professionals' perceived benefits of using ECOPIH. In particular, some of these variables refer to the benefits relative to quality improvement, while others are relative to the cost reduction that ECOPIH can offer its users. The variable *Perceived usefulness of ECOPIH* has two dimensions: *Perceived usefulness for improving clinical practice quality*, and *Perceived usefulness for reducing costs*. Both dimensions were obtained using principal component factor analysis. By conducting a set of statistical tests, we were able to establish the suitability of the analysis, as well as the reliability of the scale. All the variables of the correlation matrix showed high correlations and the value of their determinant was 0.041. The Kaisser-Meyer-Olkin index value was 0.924 and Bartlett's test of sphericity value was 1983.717, with a significance of 0.000. This analysis explained 86.846 % of the variance, and Cronbach's alpha values were higher than 0.81 in all the scales. According to Nunnally [47], this indicator must have values higher than 0.7 in general, and 0.6 in the case of new scales. Thus, it is possible to assume that the scales used were reliable. Additionally, the content and construct scales' discriminant, convergent and nomological validity were also addressed. With regard to the content, the scales were developed following a major review of the literature (Table 3).

The results obtained from the data analysis are shown in the following sections. In order to establish the healthcare professional's profile, univariate analyses were performed on the different sociodemographic and ICT use variables for the selected sample. In addition, in order to identify the discriminant variables of ECOPIH use for the sample as a whole and for the sub-samples (physicians and nurses, respectively), discriminant analysis was performed.

Ethics

The ECOPIH project has been reviewed and approved by the Ethics Committee and Clinical Research of the

Table 2 Variables used in the study

Model variable		
ECOPIH use		The healthcare professional uses ECOPIH. Dichotomous variable, where 0 = no and 1 = yes.
Perceived usefulness of ECOPIH	Perceived usefulness for improving clinical practice quality (PU1)	Metric variable obtained from a principal component analysis (see Table 3) determining the extent to which the healthcare professionals perceived that ECOPIH use improved clinical practice quality.
	Perceived usefulness for reducing costs (PU2)	Metric variable obtained from a principal component analysis (see Table 3) determining the extent to which the healthcare professionals perceived that ECOPIH use reduced clinical practice costs (in time and effort invested in getting hold of information).
Perceived ease of use of ECOPIH		Variable measured on a 5-point Likert scale indicating the healthcare professionals' perceived ease of use of ECOPIH.
Security and confidentiality		Variable measured on a 5-point Likert scale indicating the level of patient data security and confidentiality that ECOPIH has.
Healthcare professional profile		Dichotomous variable indicating the individual's professional profile. 1 = physician and 0 = nurse.
Ict user profile	Mobile device use	Categorical variable indicating the extent to which the ICT user uses different types of mobile device. 1 = low, 2 = medium, 3 = high, 4 = advanced.
	Social media website and application use	Categorical variable indicating the extent to which the ICT user uses social media technologies (access to social networks). 1 = low, 2 = medium, 3 = high, 4 = advanced.
Professional specialization level		Dichotomous variable indicating professional specialisation level in the healthcare sector. 0 = nurse, 1 = physician.

Table 3 Factor analysis results. Perceived usefulness of ECOPIH

	Improved quality	Reduced costs
ECOPIH allows the number of referrals to be reduced	0.950	
ECOPIH allows the quality of referrals to be improved	0.967	
ECOPIH allows patient care to be improved	0.958	
ECOPIH improves communication between levels of care	0.921	
The platform that ECOPIH uses (e-Catalunya platform) is satisfactory in terms of displaying information.		0.891
The time it takes to get answers to my queries on ECOPIH is satisfactory for my needs		0.831
The quality of ECOPIH content is good		0.911
Access to specialists to consult on particular cases is easy		0.891
The ability to look up old cases for resolving new issues is useful		0.912
Eigenvalue	3.602	1.938
Variance explained	68.769	18.077
Cronbach's alpha	0.963	0.932

Primary Care Research Institute IDIAP Jordi Gol (Barcelona, Spain) [24].

The ECOPIH project follows the national regulation (Spanish Law 14/2007, 3rd July, Biomedical Research) and International regulations for ethical issues (Helsinky and Tokio declarations). The features of the intervention exclude the study to meet the national regulations for clinical trials. On the other hand, confidentiality is guaranteed under the Personal Data Protection Law (15/1999, 13th December).

All Participants were informed about the research objectives before completing the questionnaire. Furthermore, it was also specified that the information obtained would be used for further research purposes. By completing this questionnaire, participants were giving their implied consent to participate in the study.

From ECOPIH platform is not possible to access the medical history of patients.

Results

Healthcare professional sociodemographic profile

The sample comprised a total of 166 healthcare professionals. Of these, 65.6 % were physicians, as shown in Table 3. Regarding gender, 68.1 % were female. Based on professional profile (physician *versus* nurse), we found that these percentages differed; just over half of the physicians (56.9 %) were female whereas the large majority of nurses (89.5 %) were female (see Table 4).

Most professionals had many years of work experience as 56 % of the sample were over 45 years of age. Based

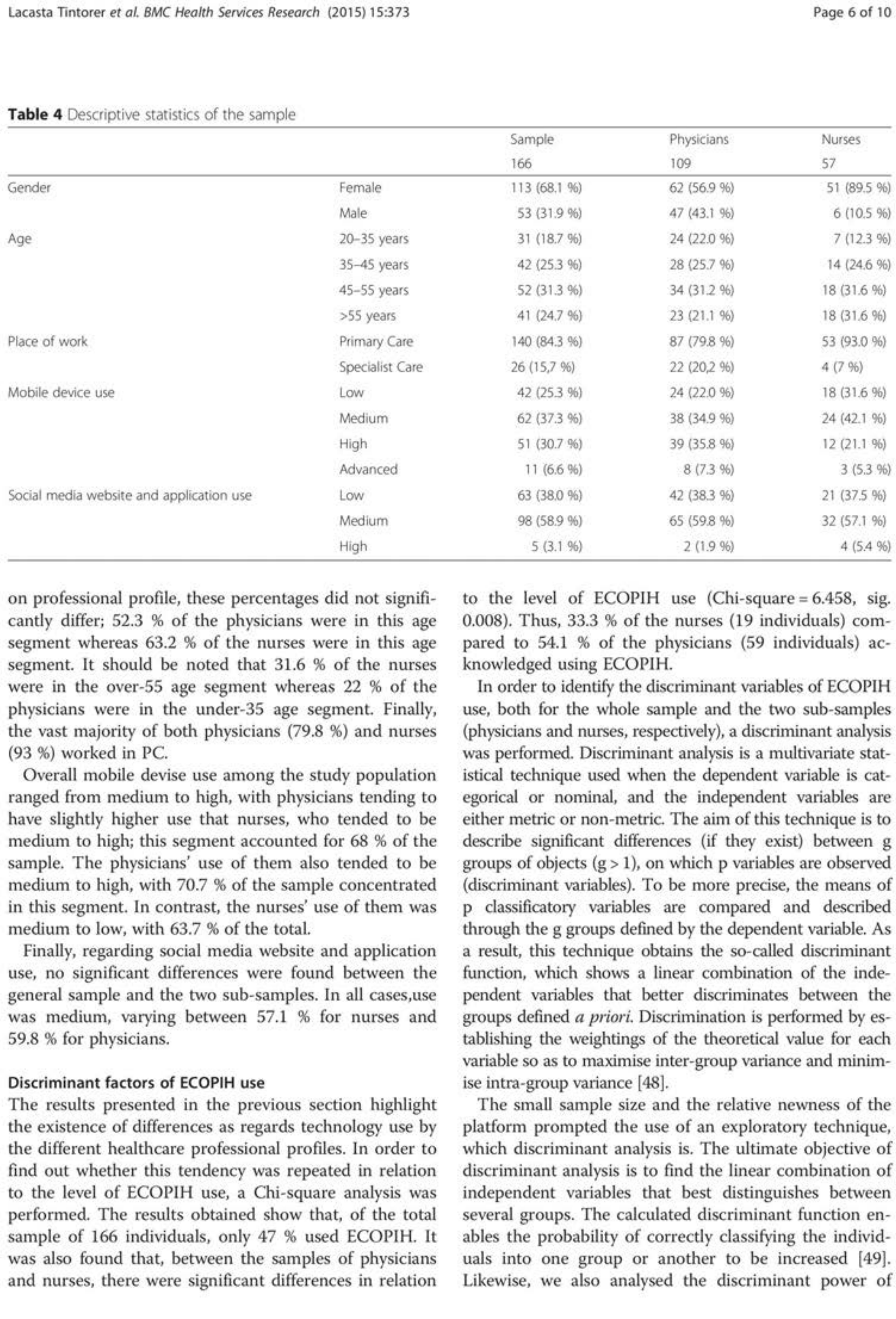


Table 4 Descriptive statistics of the sample

		Sample 166	Physicians 109	Nurses 57
Gender	Female	113 (68.1 %)	62 (56.9 %)	51 (89.5 %)
	Male	53 (31.9 %)	47 (43.1 %)	6 (10.5 %)
Age	20–35 years	31 (18.7 %)	24 (22.0 %)	7 (12.3 %)
	35–45 years	42 (25.3 %)	28 (25.7 %)	14 (24.6 %)
	45–55 years	52 (31.3 %)	34 (31.2 %)	18 (31.6 %)
	>55 years	41 (24.7 %)	23 (21.1 %)	18 (31.6 %)
Place of work	Primary Care	140 (84.3 %)	87 (79.8 %)	53 (93.0 %)
	Specialist Care	26 (15,7 %)	22 (20,2 %)	4 (7 %)
Mobile device use	Low	42 (25.3 %)	24 (22.0 %)	18 (31.6 %)
	Medium	62 (37.3 %)	38 (34.9 %)	24 (42.1 %)
	High	51 (30.7 %)	39 (35.8 %)	12 (21.1 %)
	Advanced	11 (6.6 %)	8 (7.3 %)	3 (5.3 %)
Social media website and application use	Low	63 (38.0 %)	42 (38.3 %)	21 (37.5 %)
	Medium	98 (58.9 %)	65 (59.8 %)	32 (57.1 %)
	High	5 (3.1 %)	2 (1.9 %)	4 (5.4 %)

on professional profile, these percentages did not significantly differ; 52.3 % of the physicians were in this age segment whereas 63.2 % of the nurses were in this age segment. It should be noted that 31.6 % of the nurses were in the over-55 age segment whereas 22 % of the physicians were in the under-35 age segment. Finally, the vast majority of both physicians (79.8 %) and nurses (93 %) worked in PC.

Overall mobile devise use among the study population ranged from medium to high, with physicians tending to have slightly higher use that nurses, who tended to be medium to high; this segment accounted for 68 % of the sample. The physicians' use of them also tended to be medium to high, with 70.7 % of the sample concentrated in this segment. In contrast, the nurses' use of them was medium to low, with 63.7 % of the total.

Finally, regarding social media website and application use, no significant differences were found between the general sample and the two sub-samples. In all cases,use was medium, varying between 57.1 % for nurses and 59.8 % for physicians.

Discriminant factors of ECOPIH use

The results presented in the previous section highlight the existence of differences as regards technology use by the different healthcare professional profiles. In order to find out whether this tendency was repeated in relation to the level of ECOPIH use, a Chi-square analysis was performed. The results obtained show that, of the total sample of 166 individuals, only 47 % used ECOPIH. It was also found that, between the samples of physicians and nurses, there were significant differences in relation to the level of ECOPIH use (Chi-square = 6.458, sig. 0.008). Thus, 33.3 % of the nurses (19 individuals) compared to 54.1 % of the physicians (59 individuals) acknowledged using ECOPIH.

In order to identify the discriminant variables of ECOPIH use, both for the whole sample and the two sub-samples (physicians and nurses, respectively), a discriminant analysis was performed. Discriminant analysis is a multivariate statistical technique used when the dependent variable is categorical or nominal, and the independent variables are either metric or non-metric. The aim of this technique is to describe significant differences (if they exist) between g groups of objects ($g > 1$), on which p variables are observed (discriminant variables). To be more precise, the means of p classificatory variables are compared and described through the g groups defined by the dependent variable. As a result, this technique obtains the so-called discriminant function, which shows a linear combination of the independent variables that better discriminates between the groups defined *a priori*. Discrimination is performed by establishing the weightings of the theoretical value for each variable so as to maximise inter-group variance and minimise intra-group variance [48].

The small sample size and the relative newness of the platform prompted the use of an exploratory technique, which discriminant analysis is. The ultimate objective of discriminant analysis is to find the linear combination of independent variables that best distinguishes between several groups. The calculated discriminant function enables the probability of correctly classifying the individuals into one group or another to be increased [49]. Likewise, we also analysed the discriminant power of each factor, taking into account the role of the healthcare professional: physician vs. nurse.

Table 5 shows the goodness-of-fit and explanatory power statistics of the discriminant analyses performed for the whole sample and the two sub-samples, and the standardised coefficients of the calculated discriminant functions. The goodness of fit of the models was confirmed by the values and levels of significance reached by Box's M test and the Chi-square statistic. Likewise, the eigenvalues of the discriminant functions were high, as were the canonical correlation values, thus indicating that the calculated function had high discriminant power.

Regarding the whole sample, we can see that the two dimensions making up perceived usefulness discriminate between the healthcare professionals that use the platform and those who do not. Specifically, perceived usefulness for reducing costs associated with clinical practice is the factor with the greatest discriminant power ($\beta = 0.547$). In descending order of importance, it is followed by perceived usefulness for improving clinical practice quality ($\beta = 0.476$), and lastly by habitual social media website and application use, which is also a factor that makes a greater contribution to the discriminant function, with a coefficient of $\beta = 0.237$. Thus, through both the high level of significance (99 %) as the value of β coefficients obtained by the variables *perceived usefulness for improving clinical practice quality and perceived usefulness for reducing cost*, it is possible to conclude that hypothesis H1 was confirmed. In addition, taking into account the result for the variable *social media website and application use*, it is possible to conclude that hypothesis H4.2 was confirmed. Finally, given the lack of significance of the results obtained, the rest of the hypotheses proposed in the theoretical model were rejected.

If we turn to the two sub-samples of healthcare professions, we can see that the usefulness stemming from ECOPIH use changes. Thus, for the physicians, perceived usefulness for reducing costs associated with clinical practice is the main factor when it comes to discriminating between using or not using the platform ($\beta = 0.943$). For the nurses, however, it is the perceived usefulness of the platform for improving clinical practice quality that ranks highest, and the one that has the biggest influence on their decision to use it ($\beta = 0.523$). Taking into account the values obtained for the variables *perceived usefulness for reducing cost* and *social media website and applications*, it is possible to conclude that hypotheses H1.2 and H4.2 were confirmed for the physicians.

Also in the case of the nurses, the factor that has greater discriminant power is perceived ease of use ($\beta = 0.542$). For the physicians, however, habitual social media website and application use is the second factor with discriminant power within the function ($\beta = 0.304$). Taking into account the values obtained for the variables *perceived usefulness for improving clinical practice quality and perceived ease of use*, and its high degree of significance, it is possible to conclude that hypotheses H1.2 and H4.2 were confirmed for the physicians.

To sum up, Table 6 shows the accepted and rejected hypotheses for each of the samples.

Discussion

The research revealed three main results. First, for the whole sample, the main discriminant factor that distinguished between ECOPIH users and non-users was the perception of reduced costs associated with clinical practice. It was followed by the healthcare professional's perception of usefulness for improving clinical practice quality. Finally, habitual social media website and application use completes the configuration of the discriminant factors of ECOPIH use. These results suggest that the discriminant factors associated with organisational dynamics (reduced costs), clinical activity outcomes (improved quality) and with technology use are those that have the greatest influence on the

Table 5 Standardised coefficients of the discriminant function

	Whole sample function	Physician sample function	Nurse sample function
Perceived usefulness for improving clinical practice quality	0.476***		0.523***
Perceived usefulness for reducing costs	0.547***	0.943***	-
Perceived ease of use	-	-	0.542***
Security and confidentiality	-	-	-
Mobile device use	-	-	-
Social media website and application use	0.237***	0.304***	-
Box's M	46.720 (0.000)	26.227 (0.000)	25.74 (0.000)
Chi-square	104.974 (0.000)	53.835 (0.000)	55.394 (0.000)
Eigenvalue	0.908	0.662	0.648
Canonical correlation	0.690	0.631	0.626

***$p = 0.000$

Table 6 Hypothesis confirmation

	Whole sample function	Physician sample function	Nurse sample function
H1.1. The perception of improved clinical practice quality has an influence on the healthcare professional's ECOPIH use.	YES	NO	YES
H1.2. The perception of reduced costs associated with clinical practice	YES	YES	
H2. The perceived ease of use of ECOPIH in clinical practice has an influence on the healthcare professional's use of it.	NO		YES
H3. The perception of information security and confidentiality offered by ECOPIH use has an influence on the healthcare professional's use of it.	NO	NO	NO
H4.1. The use of different mobile devices has an influence on ECOPIH use.	NO	NO	NO
H4.2. The use of different social media websites and applications has an influence on ECOPIH use.	YES	YES	NO

healthcare professionals' decision to use the platform. In this respect, it is important to note the importance of considering personal, organisational and outcome elements to foster ICT use in the field of healthcare.

Second, the results obtained from the discriminant analysis are clearly differentiated for the two subsamples (physicians and nurses, respectively). For the physicians, the main discriminant factor was their perception of reduced costs brought about by using ECOPIH. For the nurses, however, the discrimination resulted from their perceptions of improved clinical practice quality and of the platform's ease of use. As the TAM suggests, the statistical significance of these two discriminant factors refers to the importance of the perception of usefulness and ease of use when the use of a technology needs to be explained [32, 33]. On the other hand, this distinct discriminant orientation is probably the result of a different approach to using the platform, as a consequence of a care service provision that is also different. The physicians, with greater strategic and organisational responsibilities within the healthcare centres, see ECOPIH as a useful platform in the decision-making and cost-reduction process at a time of evident difficulties for the health system. In contrast, the nurses, whose approach to care is more pragmatic, rate the platform's improved clinical practice quality and ease of use dimensions more highly.

Finally, habitual social media website and application use is of secondary importance in the configuration of the discriminant factors of ECOPIH use by the physicians. Although some physicians seem to be reluctant to move into social network applications, new models for staying abreast of and sharing medical knowledge with other physicians is needed due to the vast amount of medical knowledge required for patient care in PC fields [50]. It is, therefore, reasonable to assume that physicians are increasingly seeking alternatives for sharing information, and clinical VCoPs could provide an efficient and effective means of achieving this.

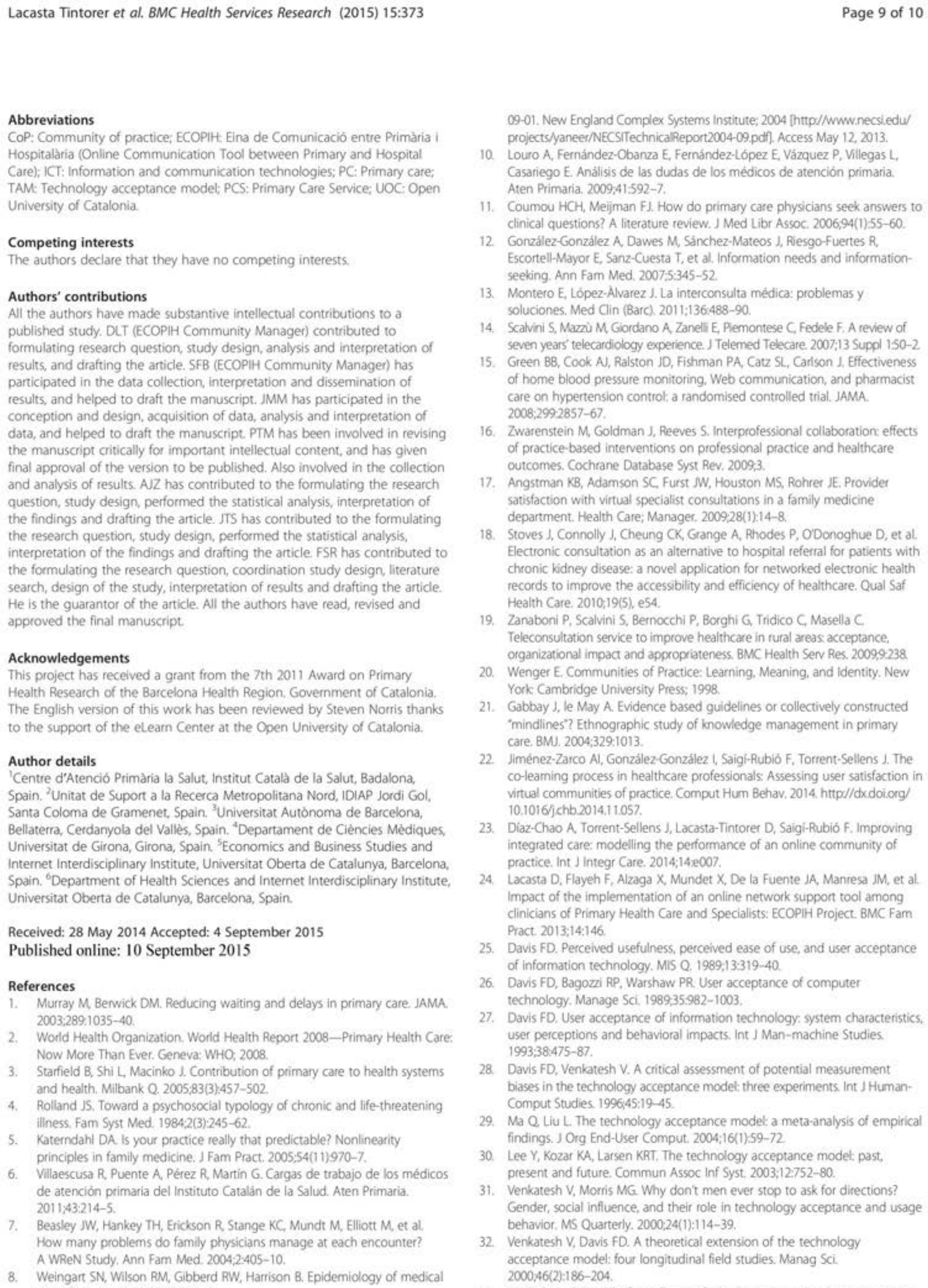
In most of the studies published to date, teleconsultation and data transfer is limited to Primary Care physicians and specialists without including other healthcare professionals, but our study provides new evidence because it finds that this perception of usefulness varies depending on the professional group analysed.

The research presented here has a number of limitations, particularly sample size, the constructs and indicators used, and the lack of a longer time series. Nevertheless, given the importance to the healthcare system of using Web 2.0 communication platforms like this one, and the availability of data for a group of professionals, it brings new evidence to the debate. Recommendations for future study therefore include increasing sample size, extending the analysis and incorporating new explanatory dimensions.

Conclusions

In the context of communities of practice, two substantive conclusions can be drawn from this work. First of all, the perception of usefulness of Web 2.0 platform use for communication between primary and specialist healthcare professionals in the integration across primary and hospital care is determined by organisational, technological and social factors. Specifically, the position that professionals have within the healthcare structure and particularly the closer healthcare professionals' activity is to patients and their professional experience of using social networks and ICTs are crucial to explaining the use of such platforms. Public policies promoting the use of ICTs in the field of medicine in general, and in communities of practice in particular, should therefore go beyond the purely technological dimension and consider other professional and social determinants, as well as those of an organisational and contextual nature.

Finally, a dynamic approach to the design of Web 2.0 communication platform use by PC professionals and specialists is needed, particularly when it targets a variety of end-users. Hence the importance of conducting studies prior to using such platforms, and attempting to identify which of the above-mentioned variables could exert an influence and how.



Abbreviations

CoP: Community of practice; ECOPIH: Eina de Comunicació entre Primària i Hospitalària (Online Communication Tool between Primary and Hospital Care); ICT: Information and communication technologies; PC: Primary care; TAM: Technology acceptance model; PCS: Primary Care Service; UOC: Open University of Catalonia.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

All the authors have made substantive intellectual contributions to a published study. DLT (ECOPIH Community Manager) contributed to formulating research question, study design, analysis and interpretation of results, and drafting the article. SFB (ECOPIH Community Manager) has participated in the data collection, interpretation and dissemination of results, and helped to draft the manuscript. JMM has participated in the conception and design, acquisition of data, analysis and interpretation of data, and helped to draft the manuscript. PTM has been involved in revising the manuscript critically for important intellectual content, and has given final approval of the version to be published. Also involved in the collection and analysis of results. AJZ has contributed to the formulating the research question, study design, performed the statistical analysis, interpretation of the findings and drafting the article. JTS has contributed to the formulating the research question, study design, performed the statistical analysis, interpretation of the findings and drafting the article. FSR has contributed to the formulating the research question, coordination study design, literature search, design of the study, interpretation of results and drafting the article. He is the guarantor of the article. All the authors have read, revised and approved the final manuscript.

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6.4. Contribución 3. Keys to success of a community of clinical practice in primary care: A qualitative evaluation of the ECOPIH project.

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RESEARCH ARTICLE

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Keys to success of a community of clinical practice in primary care: a qualitative evaluation of the ECOPIH project

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Abstract

Background: The current reality of primary care (PC) makes it essential to have telemedicine systems available to facilitate communication between care levels. Communities of practice have great potential in terms of care and education, and that is why the Online Communication Tool between Primary and Hospital Care was created. This tool enables PC and non-GP specialist care (SC) professionals to raise clinical cases for consultation and to share information. The objective of this article is to explore healthcare professionals' views on communities of clinical practice (CoCPs) and the changes that need to be made in an uncontrolled real-life setting after more than two years of use.

Methods: A descriptive-interpretative qualitative study was conducted on a total of 29 healthcare professionals who were users and non-users of a CoCP using 2 focus groups, 3 triangular groups and 5 individual interviews. There were 18 women, 21 physicians and 8 nurses. Of the interviewees, 21 were PC professionals, 24 were users of a CoCP and 7 held managerial positions.

Results: For a system of communication between PC and SC to become a tool that is habitually used and very useful, the interviewees considered that it would have to be able to find quick, effective solutions to the queries raised, based on up-to-date information that is directly applicable to daily clinical practice. Contact should be virtual – and probably collaborative – via a platform integrated into their habitual workstations and led by PC professionals. Organisational changes should be implemented to enable users to have more time in their working day to spend on the tool, and professionals should have a proactive attitude in order to make the most if its potential. It is also important to make certain technological changes, basically aimed at improving the tool's accessibility, by integrating it into habitual clinical workstations.

Conclusions: The collaborative tool that provides reliable, up-to-date information that is highly transferrable to clinical practice is valued for its effectiveness, efficiency and educational capacity. In order to make the most of its potential in terms of care and education, organisational changes and techniques are required to foster greater use.

Keywords: Primary health care, Problem solving, Telemedicine, Referral and consultation, Education medical continuing

Background

A characteristic feature of primary (PC) surgeries is that they have to attend to a high number of patients suffering from many different health problems, whose clinical complexity is considerable [1, 2]. This means that physicians have to deal with several aspects at once, which may raise a multitude of issues in day-to-day clinical practice [3–6]. That is why such professionals require an effective system to search for and find information that enables them not only to update their knowledge, but also to solve problems efficiently and effectively [7–9].

Clinical sessions and individual conversations (in person and over the phone) with non-GP specialist care (SC) professionals are options that allow them to resolve such issues. However, given that the health system is at saturation point, communication between PC and SC is not easy, quick or effective, and it leads to many referrals

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to SC (hospitalisation or specialist outpatient clinics) that generally entail excessive delays for appointments [2, 10].

Despite the increase in access to electronic sources of information, PC physicians usually raise their queries with other colleagues in the first instance, resorting to the Internet as the second option [8, 11–13]. Several experiences that make the most of the advantages that telemedicine offers with respect to improving communication between PC and SC have proved to be beneficial in terms of efficiency, cost-effectiveness and improved medical care [14], with a high degree of satisfaction [15–17].

One of the latest approaches is the creation of communities of practice (CoPs) [18]. Applied to the field of healthcare, communities of clinical practice (CoCPs) are online platforms that draw on the advantages of Web 2.0 for the creation, dissemination and management of clinical knowledge by and among healthcare professionals working at different levels of care [19]. While evidence of their usefulness is still somewhat limited, these virtual communities have been shown to have not only a considerable capacity to transfer knowledge acquired in daily clinical practice [20–22], but also great educational potential [23–28].

While most studies have focused on analysing the results of CoCP use [29–31], on the promotion of evidence-based clinical practice [32, 33] and on final decision-making [34], it is crucial to consider the determinants of the use of CoCPs in order to fully understand the use thereof. In other words, it is necessary to perform an ex-ante analysis in the study of the determinants of COCP use instead of an ex-post analysis of the determinants of the results of CoCP use. Thus, this article presents an ex-ante analysis and aims to provide evidence of the determinants of CoCP use, beyond the study of the results thereof.

A CoCP called the ECOPIH was created in 2009. The abbreviation stands for *Eina de Comunicació Online entre Primària i Hospitalària* in the Catalan language, or Online Communication Tool between Primary and Hospital Care in English. It is a CoCP that uses a Web 2.0 platform for communication between PC and SC, bringing together healthcare professionals from PC centres and non-GP specialists from several hospitals in Badalona and Sant Adrià de Besòs (two cities in the Barcelona metropolitan area, Spain) [35]. The study of a CoCP after several years should enable an assessment to be made of whether it has met this need, by analysing the strengths and weakness that determine its use and identifying the changes that need to be made to ensure that it is used as standard in usual clinical practice.

The objective of this article is to explore healthcare professionals' views on CoCPs and the changes that need to be made in an uncontrolled real-life setting. Based on their experiences of ECOPIH and on their points of view, the characteristics that should contribute to the healthcare professionals' greater readiness to use the CoCP are analysed, as are the changes that need to be made for them to integrate it into their daily clinical practice.

Methods

Design

A descriptive-interpretative qualitative study was conducted through interviews of a group of key informants in order to learn about their perceptions of and opinions on the use and usefulness of the ECOPIH platform [36]. A qualitative methodology was appropriate for the purposes of achieving that objective because it enabled deeper knowledge to be gained of the context within which ECOPIH was used and, at the same time, it allowed the professionals' experiences and perceptions of and reasons for applying that tool to their daily practice to be evaluated [14, 37–39]. Taking into account the discourses of those professionals was essential in order to identify certain aspects that would otherwise be difficult to evaluate using other methodologies, such as social interaction between individuals and how it affects interprofessional collaboration and coordination, as well as the advantages stemming from the platform's use, and from technological and organisational changes.

Study setting

The study was conducted on the Barcelonès Nord-Maresme Primary Care Service (PCS) in Catalonia, Spain, which includes 10 PC centres and 3 SC centres (Metropolitana Nord International Health Centre in Santa Coloma de Gramenet, Barcelonès Nord i Maresme Occupational Health Unit in Badalona, and Germans Trias i Pujol University Hospital also in Badalona).

Participants and selection strategy

PC and SC professionals with communication skills were invited to take part in the study so that they could give comprehensive, in-depth opinions on the ECOPIH tool. They included a majority of users and a minority of non-users of the platform. The sampling method was theoretical, and it included professionals of different ages, professional disciplines (physicians/nurses), positions within the organisation (healthcare or managerial) and role within ECOPIH (participant or consultant). Pragmatic criteria of proximity, accessibility and ease of contact were also taken into account. Discursive representativeness was sought in order to ensure the most comprehensive breadth and depth of information and understanding of the phenomenon, and that is why a combined maximum variation sampling strategy was selected. The principal investigator approached the professionals in their workplace contexts by e-mail to request their participation in the study, looking for the predefined profiles mentioned above. This method offered the advantage of improving contact to request participation and, at the same time, it gave potential candidates greater autonomy to decide whether or not to participate in it. Moreover, we considered that, by having a closer relationship with the principal investigator, those candidates who accepted to participate would be more motivated to give their opinions. It could nevertheless be considered that this very factor might influence the sincerity with which criticism would be expressed. So, at the start of the interviews, special emphasis was placed on the importance of identifying the changes necessary to improve the tool and on the fact that the participants should express themselves with the greatest freedom. The study phenomenon is an innovative topic centred on a tool to facilitate communication between professionals working at different levels of care. Consequently, participation in the study meant that participants had to devote time to the interview in order to recount their experiences of and opinions on ECOPIH, showing critical capacity and interest in improving the tool. Informant selection was considered complete when the categories emerging from the analysis process were saturated. Under those circumstances, incorporating new informants into the study would have meant an unjustified burden for them and a greater analysis workload for the researchers, without providing any significant improvements to the findings [40–43]. A total of 30 professionals were invited to take part by e-mail. Those who accepted signed an informed consent form, which specified that the interviews would be audio recorded. Of those 30, only one person declined to take part because he/she did not want to be recorded. At the end of each session, the participants were offered the chance to receive a copy of the transcription for checking so that the research team could gather feedback from individual informants to assess the validity of findings and ensure that data were interpreted correctly.

Data-generating techniques

Data was obtained from focus groups, triangular groups and semi-structured individual interviews. These three types of interviews were used because they facilitated the informants' participation, given their geographical dispersion and other logistical aspects such as time availability for interviews. In addition, the triangular groups allowed topics to be covered in depth with less group pressure, thereby creating more interactive and productive dynamics.

The interviews were held at the centres where the professionals worked to make it easier for them. All the interviews were moderated by the study's principal investigator. Interview moderation was based on a pre-established topic script that the research team had agreed upon after a review of the literature and a pooling of their experience [see Additional file 1]. In addition, before the interviews started, the moderator stressed the need for the interviewees to express their opinions and experiences of ECOPIH in an honest manner, since the aim was not to obtain polite answers but instead to identify which elements of the tool could be improved. The participants' characteristics by interview technique type and length are shown in Table 1.

Data analysis

Verbatim transcriptions of the recordings were done by the principal investigator, and the informants' identifying data were anonymised [44]. To aid understanding in this article, quotations from the interviews have been translated into English by a professional academic translator and revised by the research team to verify that the meaning of the original discourse was maintained. The analysis procedures were done manually. A thematic interpretative content analysis [45, 46] was performed and the analysis procedures were done manually by the same

Table 1 Characteristics of the participants in the individual and group interviews

	Individual interviews	Triangular group	Focus group	TOTAL
Total number of participants	5	7	17	29
Number of interviews	5	3	2	10
Gender (M:F)	3:2	4:3	4:13	11:18
Age	< 35 years old: 0 35–50 years old: 4 > 50 years old: 1	< 35 years old: 0 35–50 years old: 4 > 50 years old: 3	< 35 years old: 2 35–50 years old: 10 > 50 years old: 5	< 35 years old: 2 35–50 years old: 18 > 50 years old: 9
PC:SC	2:3	2:5	17:0	21:8
Physician: Nurse	5:0	7:0	9:8	21:8
Number of directors	2	5	0	7
Use profile (NU:P:C)*	1:1:3	0:0:7	4:11:2	5:12:12
Length (minutes)	45–60	60–70	90–100	635

*Use profile. *NU* Non-user, *P* Participant, *C* Consultant investigator. Firstly, the transcriptions were read carefully and repeatedly in order to get an in-depth knowledge and full understanding of them. Such reading enabled pre-analytical intuitions to be developed. In the analysis phase, quotations were identified and coded, and categories were created based on the script of topics explored in the interviews. These were then regrouped and, after analysing each category and establishing relationships, an explanatory framework was finally created. In the case of discourse polarisation (relating to the collaborative virtual environment and to non-access to health records, for example), it was described, analysed and interpreted because it was felt that it offered a relevant point of view. Data collection and analysis was performed in parallel. Thus, as the analysis progressed, the results suggested the acquisition of new data in order to expand and improve the phenomenon's interpretation, hence the incorporation of new key informants. In particular, an in-depth analysis of the tool's weaknesses and the proposals for increasing its use was performed. In the analysis phase, the analyst held regular meetings with the research team to discuss and agree on the analysis categories. In addition, the findings were discussed with a researcher outside the project, who was an expert in qualitative research. Quotations from discussions have been included to illustrate the process of interpretation based on data relevance and clarity. The research team remained conscious of their backgrounds and experiences, and how their positionality might influence the analysis and the interpretation of the data. Indeed, the research team was mindful of this throughout every stage of the study and was very clear that the priority was to identify what points could be improved and what changes were needed to ensure that the tool could be incorporated into the context of usual practice within primary care and to contribute to the expected improvements by means of its application, which may have partly controlled for its influence on the results. The research team tried, at all times, to have an ethnographic attitude and to delve into the meanings of the informants' opinions on and experiences of ECOPIH. In addition, the verbatim transcriptions – and translations thereof – illustrating the data were selected on the basis of criteria of clarity and relevance, and they show the participants' critical capacity.

Results

A total of 29 participants were recruited to the study, among whom were 18 women, 21 physicians and 8 nurses. Of the interviewees, 21 were PC professionals, 24 were users of ECOPIH and 7 held managerial positions. A total of 2 focus groups, 3 triangular groups and 5 individual interviews were conducted (Table 1). Additional file 2 shows the profile of each participant.

Overview

For a system of communication between PC and SC to become a tool that is habitually used and very useful, the interviewees considered that it should have a series of specific characteristics. Table 2 summarises the key points identified in the interviews and focus groups. The analysis of each of the topics and the relationships among them led to the creation of an explanatory framework of the key points for the platform's success (Fig. 1).

PC query handling

Many aspects of ECOPIH were valued positively. A considerable number of the interviewees highlighted the effectiveness and speed of responses, as well as the ease of accessing the platform and contacting a non-GP specialist. This speed (responses within 24–48 h) might not be quick enough for some members of the nursing group, who are used to the immediacy of consulting with colleagues nearest to them as a way of resolving queries (Table 2).

Type of information that people want to find

The information obtained from the ECOPIH query was valued positively by the interviewees because they considered it comprehensive, reliable and up to date.

On the other hand, some professionals mentioned the common difficulty of finding information that is directly applicable to real PC patients, because such patients are often under-represented in clinical practice guides or training courses. Clinical cases specific to PC patients were found in ECOPIH, thus facilitating the transfer of advice given by the non-GP specialists to clinical practice.

Several participants (INT. 9, 16, 26) mentioned that this aspect improved when the consultant non-GP specialist was a professional who had an understanding of PC and was close to it, since there were greater similarities in patient focus. In addition, a more personal relationship could be established, thus increasing trust in the answer (Table 2).

Knowledge management

In the interviews, the professionals identified the need to establish an approach that would bring different areas of care closer together in order to achieve a collaborative working culture that would benefit patients.

Different communication mechanisms between care levels have traditionally been set up. Despite that, the participants in our study stated that contact via these channels of a more classic nature had major limitations. Thus, the telephone channel presented the difficulty of locating the non-GP specialist and, when located, he/she did not often show the necessary predisposition, or perhaps the moment was not right for such interaction, which he/she experienced as an interruption. Classic face-to-face consultation also had physical and temporal

Table 2 What characteristics should a PC-SC communication tool have?

Topic	Key points identified
PC query handling	*"You search for the specialty, you click and then you send it. You don't need to have any personal contact to get someone to resolve it." INT. 16 (PC physician, female).* *"I tend to approach the people I work with more (…). I ask the people around me, I think it's more immediate. I'm quite impatient, so I need immediate answers." INT. 24 (PC nurse, female, non-user)*
Type of information	*"(The specialists) give you much more comprehensive information than they do when giving an immediate, off-the-cuff answer." INT. 15 (PC physician, female)* *"It is a reliable source because they are the go-to people." INT. 19 (PC nurse, female)* *"You may have the clinical practice guide and then you come across patients whose cases fall between the gaps in all of them. The fact that it's a real patient (in ECOPIH) helps a lot because courses focus mostly on the topic, so then it's quite hard to adapt it to specific cases that present in the surgery, such as patients with complex conditions. When it comes to providing care, they are real cases that you have to deal with and really need to consult on." INT. 15 (PC physician, female)*
Knowledge management	*"What we need is a forum where we can discuss things; that would be the ideal clinical session, where you can sit down with your colleagues… that doesn't happen, or happens very little in the teams. It was the type of tool I needed, that I'd been looking for, and it was good for me." INT. 4 (PC director, male)* *"When we call the hospital, they answer as fast as they can, as if you were bothering them." INT. 15 (PC physician, male)* *"Virtual consultation is convenient, provides an answer for that patient and is very powerful. But I still think that they are complementary tools for dealing with knowledge. If I put that query on ECOPIH, I'm asking a more generic question and will find a more generic answer that I can use for other patients too, and thousands of other colleagues of mine will also see it." INT. 4 (PC director, female)* *"ECOPIH is about building pillars for the future. The other system, virtual consultation, is about improving day-to-day management, the speed of action is much quicker at strategic management level. ECOPIH will give you that in the long term." INT. 28 (PC director, male)* *"We have quite a few clinical issues to resolve every day over the phone. If more people could see them, perhaps they wouldn't need to ask about them again. There are many duplicate consultations. That's the philosophy that needs to prevail." INT. 2 (SC physician, male)* *"It's more enriching when everyone can see it, it's much more enriching for me." INT. 13 (PC physician, female)* *"The larger the audience, the greater the fear of giving answers; some are undoubtedly a bit more defensive. It has an influence; it curbs the spontaneity that there would otherwise be in certain cases (…). I'm sure it has an influence, and a negative one in some cases." INT. 8 (SC physician, male)*
Cultural aspects	*"(If ECOPIH had come from the hospital), it would have been used less. Because, if it comes from opposition rather than joint work, it is the hospital that puts its stamp of authority on it, while in primary care they act like automatons within models that may not be the best because there's been no debate." INT. 28 (PC director, male)* *"If ECOPIH had come from the hospital, it would have been seen as something quite natural (by the specialists). Instead, it's something that comes from below, from family doctors. It has created an attitude of anticipation rather than enthusiasm. (…). ECOPIH balances things out, that's what technologies do, they are very democratic. Here, you treat specialists as equals, but that isn't understood in the hospital. (…) It's a change of role. (…) and there's resistance to change." INT. 3 (SC director, male)* *"Above all, I think it's an attitude of wanting to be more proactive, of shaking off your fears and wanting to do things differently." INT. 2 (SC physician, male)* *"I'd consult more often, but my feeling of embarrassment is quite intense. It's an insurmountable embarrassment." INT. 9 (PC physician, female)* *"There aren't enough nursing topics to consult on because, in nursing, you make your bed and you lie in it. Maybe the direction in nursing is the opposite. In medicine, questions are asked, and in nursing, maybe the experts should be the ones who present news so that people can be informed or debate can be generated." INT. 23 (PC nurse, female)* *"I find that some of the topics aren't very specific, there are many medical things." INT. 19 (PC nurse, female)*
Technological aspects	*"Access needs to be more direct. So that at the time when you have a query about a patient, when its fresh in your mind, you can make it more dynamic." INT. 15 (PC physician, female)* *"We did have some training, but when you start using it again, you forget what you've learned." INT. 22 (PC nurse, male)*
Organisational changes	*"It's something connected with work, but when you're at work you can't find the time to do it." INT. 19 (PC nurse, female)* *"It depends a lot on how you understand your profession. If you're curious and need to increase your knowledge, you'll use ECOPIH or you'll study at home, you have to read, you need time." INT. 4 (PC director, female)* *"If you link it to senior management, you might undermine the tool to some extent because it is perceived as a form of managerial control. When MBO ends, the tool ends because there hasn't been any personal motivation. It's risky, it might by counterproductive for the tool." INT. 28 (PC director, male)* *"Recognition of the tool itself by provider companies is what's missing; they need to integrate it into the initial visits. The two managers, of primary care and hospital care, need to sit down and decide what it means, how to recognise this work." INT. 3 (SC director, male)*
Legal liability	*"I understand that it's a secure tool. It doesn't worry me, I do things that are much more insecure than this, for example, replying by e-mail, a telephone call… The thing here, though, is that it's in writing, and it stays that way forever. The legal ramifications of this don't worry me, but the very lack of definition of project makes me wonder: 'Here, if I make a mistake and I receive a complaint about something I've said here, would the Catalan Health Institute consider it theirs?'." INT. 3 (SC director, male)*

constraints (limited timetables, a lack of recording for subsequent consultations, limited information conveyed to both professionals), which forced anyone who wished to raise a query with a non-GP specialist to do so through personal contacts in informal conversations ("cronyism") or by interrupting clinics.

Regarding the coexistence of ECOPIH alongside other SC communication systems, whether traditional (e.g., face-to-face consultations) are more innovative (e.g., virtual specialist consultations through access to patients' health records), several interviewees highlighted that, without underestimating the obvious advantages of such systems, the consultations of

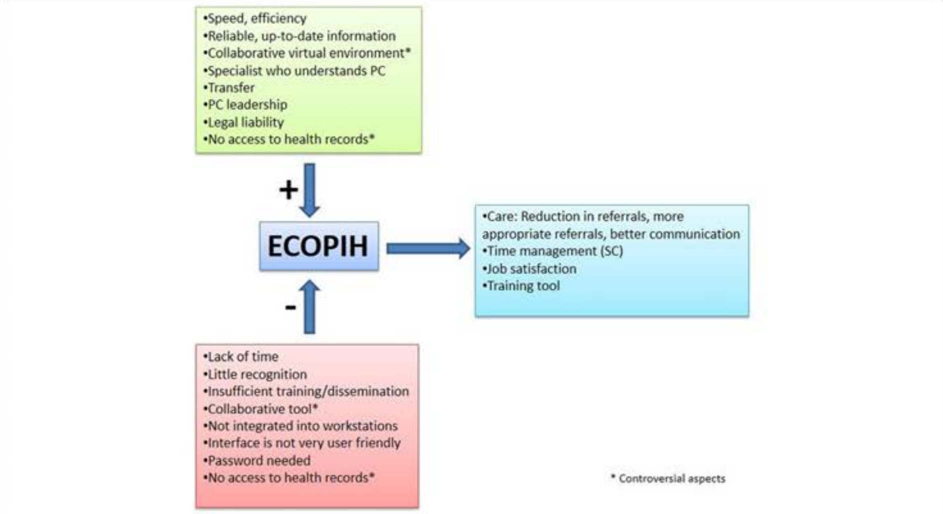
•Speed, efficiency
•Reliable, up-to-date information
•Collaborative virtual environment*
•Specialist who understands PC
•Transfer
•PC leadership
•Legal liability
•No access to health records*
+
ECOPIH
-
•Care: Reduction in referrals, more appropriate referrals, better communication
•Time management (SC)
•Job satisfaction
•Training tool
•Lack of time
•Little recognition
•Insufficient training/dissemination
•Collaborative tool*
•Not integrated into workstations
•Interface is not very user friendly
•Password needed
•No access to health records*
* Controversial aspects

Fig. 1 ECOPIH explanatory framework

clinical cases raised via ECOPIH were more interesting and comprehensive, and that they added educational value for future cases. The tools were therefore complementary.

Several participants explained that such communication should ideally take place virtually. They also said that it would be positive if it became a common forum for sharing clinical cases. For most of the interviewees, the fact that content was visible to all users, who in turn could get involved in the discussion about the case, was an advantage. They also felt that it should be used more widely, so long as patient confidentiality was assured. This form of consultation was enriching because it allowed people to learn about other ways of working and helped to reassure professionals who could see that other colleagues had the same queries as they did. The transmitted knowledge was spread widely and learning was fostered. This was also highlighted by the non-GP specialists, who considered that many of the consultations they received via e-mail were similar. Thus, a public discussion forum would prevent duplicate consultations.

Despite that, a few professionals considered that creating debates on consultations was not positive and that they should stay within a question-answer system. They also felt that tense situations might be created if there was disagreement with the non-GP specialist. Some PC users believed that the collaborative aspect of the tool might represent a barrier because some professionals are reluctant to express themselves in public, because it might lead to doubts about who has access to the content (management, senior management, etc.) and because it might make the consultants' answers more defensive (Table 2).

Cultural aspects

The interviewees mentioned the effect of the tool's origin on predisposition towards its use. Thus, the PC professionals said that they would have been more receptive if the tool had been created within PC itself, which would have led to greater use. SC had remained expectant for the same reason.

On the other hand, some professionals interviewed considered that one of the main determining aspects of ECOPIH use was people's attitudes towards such tools. Thus, qualities like being receptive to new ideas, proactivity, enthusiasm and predisposition towards sharing doubts in a group situation were essential, and the lack thereof partly explained a low level of participation. They also highlighted the importance of shaking off one's fears of embarrassment when expressing one's doubts in public, though they also mentioned that this concern could be resolved in part if the consultations were anonymous.

On this point, it should be noted that, according to some of the interviewees, the nursing group was less accustomed to sharing their doubts and therefore adopted a passive attitude more often. Together with the fact that other users felt that few specific nursing-related topics were mentioned, this aspect meant that the nursing group's use of the tool was lower (Table 2).

Technological aspects

Regarding the technological aspects, the main problem that users referred to was the high number of platforms and workstations used in daily practice, each with its own particular characteristics: electronic health records, shared health records, e-mail, other consultation systems, etc. The use of ECOPIH via the e-Catalunya platform did not present any major difficulties other than the personal skills of each user of the technology. That said, it seemed to be a platform that was not sufficiently easy to use because it required too many clicks and intermediate steps to get to the consultations. Older users found the platform more difficult to handle, and personal attitude was again the key factor in overcoming that limitation.

Regarding the e-Catalunya platform, several professionals suggested the following improvements: making access easier by integrating it into habitual workstations or a mobile app; grouping information by topic given that a lot of content was building up over time; having an e-mail notification system containing the text of new contributions; and having the option to use filters or lists of the most frequent consultations.

Regarding the possibility of accessing the patients' health records, the participants felt that, while it would make the tool more formal, it could jeopardise its immediacy and ease of use, and would introduce conflicts with respect to confidentiality and disseminating knowledge among other users.

Although the e-Catalunya platform's operation was straightforward for most users, some professionals needed more ongoing support or training to maintain their skills in order to use the tool (Table 2).

Organisational changes

One of the main determining factors of ECOPIH non-use was the lack of available time during the working day, despite the fact that the tool was wholly connected with work. Most of the interviewees rejected the idea of spending their own time on this task, although some considered that learning and trying to resolve unclear cases in their own time was part and parcel of the profession.

On the other hand, the interviewees highlighted the little or zero recognition of the activities that they undertook in ECOPIH by the senior management of the various services or provider companies. As the platform evolved, someone suggested including its use as an evaluation indicator in the Management by Objectives (MBO) appraisal [47] in order to foster and recognise its use. It was a controversial topic because, while some people did consider it a good strategy to increase its use, most of the users were against that option because it might cause rejection due to it being interpreted as something connected with senior management.

In short, several users mentioned that the organisation should decide whether or not it wanted roll out a tool like ECOPIH, reflecting that commitment in a contract or agreement to enable the associated tasks to be included in the service portfolio of each specialty. Thus, the work done could be recognised by counting it as if it were a referral for consultation (Table 2).

Legal liability

Finally, all of the PC professionals interviewed were very clear about the fact that legal liability would fall to the PC professional dealing with the patient because that was how it was stated in the ECOPIH usage rules. The non-GP specialists taking part in this study were not concerned about this issue because they considered that the opinion expressed was advice, corresponding to the non-GP specialists' theoretical action as it would have been taken in a consultation. They highlighted that they habitually undertook other consultation activities as if they were referrals, such as telephone calls and e-mails, which were rather more insecure in legal terms. Nevertheless, a few interviewees did express certain doubts about the legality of these types of actions because the answers were recorded in writing, as was the reply from the institution in the event of a complaint (Table 2).

Benefits derived from using ECOPIH

According to the interviews conducted, the use of ECOPIH offered a series of professional and organisational benefits (Table 3). To begin with, most of the interviewees considered that ECOPIH reduced the number of referrals for two reasons. Firstly, it enabled the doubt that would

Table 3 Benefits derived from using ECOPIH

"Of course, it reduced referrals. You refer when you have doubts about how to handle a case and you want to seek the opinion of an expert in another topic. If you manage to get this information by other means and you end up handling the case while counting on the non-GP specialist's support at all times, ultimately you don't refer it." INT. 16 (PC physician, female).
"If you come across a case that has already been discussed, you don't refer it because you have the answer." INT. 13 (PC physician, female).
"It could prevent referrals that are sometimes unnecessary. (…) It should save on visits and that means saving money and duplicate tests, so it could be an efficient tool." INT. 26 (SC physician, female).
"It isn't a huge reduction in referrals, it's referring properly… and learning." INT. 9 (PC physician, female).
"It's efficient in the sense that the patient doesn't have to go from one place to another. It prevents silly consultations from getting onto the waiting list (…) and has the potential to improve the care offered to the patient. It's a good tool, it's useful and relevant, it's safe, it has the ability to resolve issues and is probably efficient, although I can't assure you of that. It's a new way of operating that, if it saves work, will ultimately make us more efficient." INT. 3 (SC director, male).
"I think ECOPIH improves the quality of care the patient gets. It helps me and my patient." INT. 4 (PC director, female).
"It does reduce referrals a little, and if it doesn't, it means they are made properly. Sometimes it isn't as much as saying 'refer it to me' as saying 'refer it to me, but do this' or 'refer it to me with this priority'. It provides clarification when it comes to having to refer or not." INT. 29 (SC physician, female).

usually have led to a referral to be resolved, and secondly, it allowed the professionals to read the cases raised beforehand, thus leading to a better handling of patients in PC and, therefore, a reduction in the number of referrals and visits to SC. Many of the participants explained that, besides referring fewer patients, any referrals that were made would be more appropriate. The professionals therefore considered ECOPIH an efficient tool.

Even those interviewees who occupied managerial positions felt that it was an efficient tool that could reduce waiting lists, especially when a referral could not be justified for any particular reason.

There was more consensus among the users about the fact that the tool improved the quality of the referrals, for several reasons. It prevented inappropriate referrals and increased higher quality referrals. In addition, they were clinical cases in which more thought and work had been invested, so much so that on a few occasions, the simple fact of preparing a case for consultation in ECOPIH had enabled it to be resolved. Finally, for those cases that were discussed and ultimately referred, a higher number of supplementary tests had already been done. In other words, even though the response to the cases raised was to refer them, such referral was done in a more appropriate and timely way.

Table 4 Overall appraisal of the tool

"You have a query and, before you know it, you find it (the solution) right there and you're really relieved, you resolve it straight away, you learn, you sort it out." INT. 15 (PC physician, female).
"It's a trustworthy tool for family doctors." INT. 14 (PC physician, male).
"Satisfaction with the profession itself because, apart from experience that gives you time, what we need to do is increase our own knowledge." INT. 4 (PC director, female).
"ECOPIH helps to manage time. It removes the urgency of demands. It's the best way to manage time, knowing what you've got in front of you and being able to decide on the right order of execution." INT. 8 (SC physician, male).
"For us, being in ECOPIH is a strength. It's a way of becoming visible. It has helped to break down barriers, to bring professionals closer together, and that will also have reinforced its use. It's a very positive tool for improving communication among the entire community of physicians." INT. 8 (SC physician, male).
"Creating feedback between primary and non-GP specialist care is unbeatable, I think the idea is really great." INT. 29 (SC physician, female).
"It has the educational aspect that a virtual visit doesn't have, and it has the care aspect too, depending on how you apply that to a particular case while working. For a physician, training and practice are one and the same thing. If you're well-trained, your practice is better, if you're practice is better, you work better with your patients, that means everything, referrals, etc." INT. 28 (PC director, male).
"People who regularly go into ECOPIH… after one or two years those people know a lot more, if they're active, than people who've done courses on goodness knows what. (…) It is a much more pragmatic, clear and practical kind of training because you can apply it straight away and can improve care." INT. 28 (PC director, male).
"It's expert learning, it's case-based learning because your learning from the case (…)." INT. 11 (PC physician, female).
"I can see a lot of advantages in it for learning, I'm surprised by how much I manage to learn. It would be an à la carte continuing medical education because you can choose the topic." INT. 12 (PC physician, female).

Overall appraisal of the tool

Several PC physicians stated that that they were happy when they had time to raise cases for consultation on the platform, were relieved when they obtained solutions to their queries, were confident about how to handle patients and, finally, were satisfied with the profession itself because they had managed to achieve optimum handling of particular cases in an independent manner.

Most of the non-GP specialists also referred to this increase in satisfaction, and they also considered that ECOPIH was a useful tool for improving time management because it led to less interference in daily activities at work than other consultation systems, e.g., the phone (Table 4).

From the SC point of view, participation in ECOPIH was valued positively in the majority of cases because it was considered a tool that enabled communication between care levels to be improved.

Most of the interviewees considered that ECOPIH fulfilled both the educational and the care functions. This was due in part to the fact that the knowledge acquired (education) became applicable to clinical practice (care), thus implying that they were two interrelated concepts.

Some participants clarified that raising cases for consultation would mostly have a care-related function because it generally enabled real clinical cases to be resolved so long as answers were given quickly. They nevertheless felt that it would also have an educational function for other members reading the consultations made. In contrast, they considered that sharing documents would basically have an educational function. In addition, the non-GP specialists saw other advantages, such as identifying training needs for PC and even the fact that the tool could become a means of accessing self-learning in SC.

Several interviewees highlighted that ECOPIH came across as a powerful training tool, mainly because learning was based on real cases, was much more pragmatic and was directly applicable to clinical practice or to similar future cases. A few participants added that having many specialities available for consultation made it a kind of à la carte continuing medical education. It should be noted that it was pointed out on several occasions that acting solely as an observer or reader of content could increase learning.

Discussion

The need for healthcare professionals to be able to access trustworthy sources of information is well known, as is the fact that scientific literature may not be able to give direct answers to clinical questions arising in daily practice [7, 11, 48]. Having a tool that provides quick, practical and reliable information is essential for PC professionals given the multitude of queries arising in daily clinical practice [2, 6, 8, 49–51]. The opinions of ECOPIH users showed that the tool managed to meet that need. The fact that consultant non-GP specialists knew about the context within which AP physicians worked made a definitive contribution to that, and even more so if they were the go-to professionals for the PC area from which patients were referred.

According to the participating professionals, the gap between PC and SC could be bridged by implementing virtual communication tools [52–54]. ECOPIH includes the Web 2.0 concept in communication among professionals, and it does so via a CoCP, thereby triggering a change in how knowledge is managed. CoPs provide a useful model for knowledge management as well as a mechanism that facilitates and promotes a new way of working and learning based on collaborative working and the use of collective intelligence [55]. They can be especially useful in PC, where flexibility and constant coordination are key aspects of caring for patients with significant multimorbidity [56, 57].

Not surprisingly, the ECOPIH tool has a very powerful educational component that combines four aspects that, in our opinion, are essential: peer learning with the presence of an expert [32–34, 58]; learning based on real clinical cases that is directly applicable to clinical practice [20, 21]; the dissemination of knowledge to the entire community [59] (even without any active participation, i.e., lurkers); and social interaction, which is one of the main channels through which healthcare professionals create their own tacit knowledge [19, 60–64]. As in any CoP, recently qualified physicians learn by interacting with experts, who in turn may acquire new skills. In addition, collective knowledge is created and becomes available to the community over time [58, 65, 66]. They also learn together by focusing on problems that are directly connected with their work, and this is something that increases the participants' motivation, since their learning is linked to problematic situations that they can recognise or perceive as real and applicable to their work [20–22]. This is particularly relevant because the tool provides a framework for the professional development of individuals in the workplace through different forms of participation [67–69]. Hence, the ECOPIH platform offers advantages from the points of view of care and education because its use is not limited to resolving specific cases. The non-GP specialists' advice and the literature attached to it also enable other colleagues to resolve similar cases. The accumulation of experience increases not only the group's explicit knowledge, but also its tacit or practical knowledge, which emerges from reflective practice and from gathering and sharing cases among professionals [56].

On the other hand, it is also worth noting ECOPIH's considerable usefulness as time management tool for SC professionals, since it allows them to decide on how much time to spend on communicating with PC by avoiding interruptions and duplicate consultations. However, the participants often identified the lack of time as the main determining factor of ECOPIH use for resolving queries. The use of virtual communication tools like ECOPIH requires organisational changes to allow PC and SC professionals to have that time available regularly. Although participation in a CoP occurs partly because it has a certain value for the users, irrespective of whether or not it is an institutional directive [59, 70, 71], an institution must commit to the tool by incorporating it into its service portfolio [72] and by giving recognition to participants in general and to consultants in particular [20]. However, the latter issue must be addressed with care because certain incentives to use it, such as MBOs, may represent a barrier to its use. In fact, despite the implementation of networked clinical structures aimed at improving patient care and facilitating knowledge-sharing among healthcare professionals beyond the boundaries of organisations, certain bureaucratic, hierarchical and intra-professional barriers may still exist [73]. On the other hand, the time barrier could be overcome through training [74, 75], the promotion of the tool's potential usefulness, high-value content and improved technological aspects [24, 58]. More research in this field is required [76].

This point ties in with the technological issues. Ideally, the platform should be integrated into habitual workstations without the need to enter a new password [74, 77–79] and the interface should be user friendly [80]. The platform should also have a series of technical features that make it easy to use (information search and filter functions, a mobile app, etc.) [11, 48, 49, 81]. While there is some controversy surrounding the issue, it is generally considered unnecessary to have access to the patients' health records, mainly to ensure that ECOPIH's ease of use is not compromised. Nevertheless, if it were technically possible, it might be interesting to have an optional link to access patients' health records in specific instances, so long as such access is password protected and contained within a secure environment.

Concerns about legal liability stemming from advice given by a non-GP specialist via an online app have been identified in several studies, especially among SC members [15, 80, 82–86]. While virtual consultations are often considered informal, a number of peculiarities make the legalities surrounding them somewhat complex, so this is something that must be reviewed before the implementation of an online CoCP. In the case of ECOPIH, this was not a contentious issue because it was made very clear, in writing and right from the start, that the responsibility for the patients' care fell to the PC professionals; this was made explicit during the training and was visibly very prominent on the tool itself.

According to the scientific literature, a key factor for the success of a telemedicine project is that clinical professionals should be responsible for its leadership [38, 80, 87]. In our case, the experience was led by a PC professional who had a perfect understanding of the reality of professionals in that sphere and of their needs. This enabled him to adapt the tool technically and organisationally. All of this entails a series of intangible benefits, which were identified on numerous occasions in the interviews conducted, as well as in previous studies [55, 88, 89]. By improving communication between care levels, greater peace of mind and confidence when handling patients is achieved [90, 91]. This leads to improved job satisfaction for PC and SC professionals [67, 92]. According to the users of this CoCP, ECOPIH helped them reduce the number of referrals and make them more appropriate [84, 93]. However, in order to evaluate every dimension of the tool, further research should be done from a qualitative perspective on the impact of CoCPs in financial terms (a reduction in referrals and visits, and cost analysis) and clinical terms.

The rigorous procedures used (a detailed description of the context and the participants, the reflexivity of the research team and the theoretical sample to achieve discourse saturation) ensure the validity of the findings in our setting. However, caution is needed before transferring these results to other settings. In this respect, the sample selected in our study also took into account pragmatic criteria such as access to the interviewees, hence the discourses of professionals working in a rural setting were not taken into consideration. Nor was the possible effect of the population's socioeconomic position, which might have an influence on professional practice, on workload and on the information requested by citizens, thereby modifying ECOPIH use.

Conclusions

In the healthcare sphere, inter- and intra-organisational networks are crucial to the creation and dissemination of clinical knowledge because such knowledge is experiential, implicit or tacit [93]. The ECOPIH platform has proved to be a useful, satisfactory tool for improving the healthcare provided by PC professionals. It stands out as a collaborative tool that provides reliable, up-to-date information that is highly transferrable to clinical practice. The users valued its effectiveness, efficiency and educational capacity, and they considered that it improved job satisfaction. In order to make the most of its potential in terms of care and education, organisational changes are required to free up sufficient time for participants to access the tool habitually (whenever needed), as well as cultural changes for knowledge-sharing and networking, and technological changes linked to the platform and to its integration into the healthcare professionals' habitual workstations.

Additional files

Additional file 1: Table with the interview topic script developed by the research team. (DOC 45 kb)

Additional file 2: Table with the Interviewees' profiles of the 29 participants recruited to the study. (DOC 38 kb)

Abbreviations

CoCP: Community of clinical practice; CoP: Community of practice; ECOPIH: Eina de Comunicació entre Primària i Hospitalària (Online Communication Tool between Primary and Hospital Care); ICT: Information and communication technologies; PC: Primary care; PCS: Primary Care Service; SC: Non-GP specialist care; UOC: Open University of Catalonia

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Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

All the authors have made substantive intellectual contributions to a published study. DLT (ECOPIH Community Manager) contributed to formulating research question, literature search, study design, analysis and interpretation of results, and drafting the article. JMD has participated in the conception and design, acquisition of data, analysis and interpretation of data, and helped to draft the manuscript. EPR has participated in the design, analysis, interpretation of the data and results and made a critical review of the manuscript. SFB (ECOPIH Community Manager) has participated in the data collection, interpretation and dissemination of results, and helped to draft the manuscript. XMT has participated in the protocol design, interpretation of results and drafting the article. FSR has contributed to the formulating the research question, coordination study design, literature search, design of the study, interpretation of results and drafting the article. He is the guarantor of the article. All the authors have read, revised and approved the final manuscript.

Ethics approval and consent to participate

The study (P11/39) was approved by the Ethics and Clinical Research Committee of the Primary Care Research Institute IDIAP Jordi Gol, Barcelona, Spain, in 2011. All the participants signed informed consent forms before starting the interviews. All the recordings and transcriptions were stored in a coded manner, thereby ensuring the confidentiality and anonymity of the data. A commitment was also made to destroy the recordings on completion of the study.

Competing interests

The authors declare that they have no competing interests

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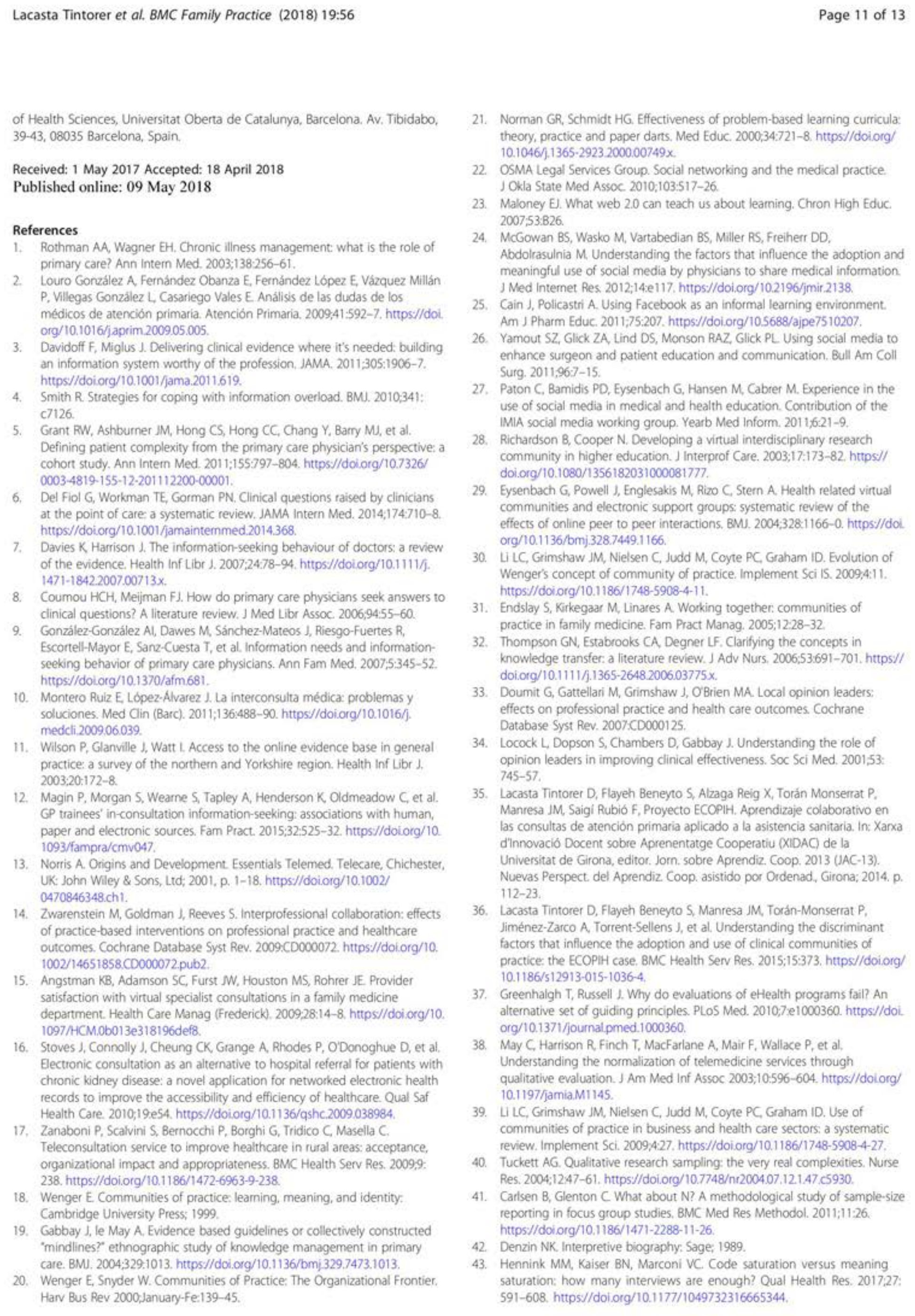

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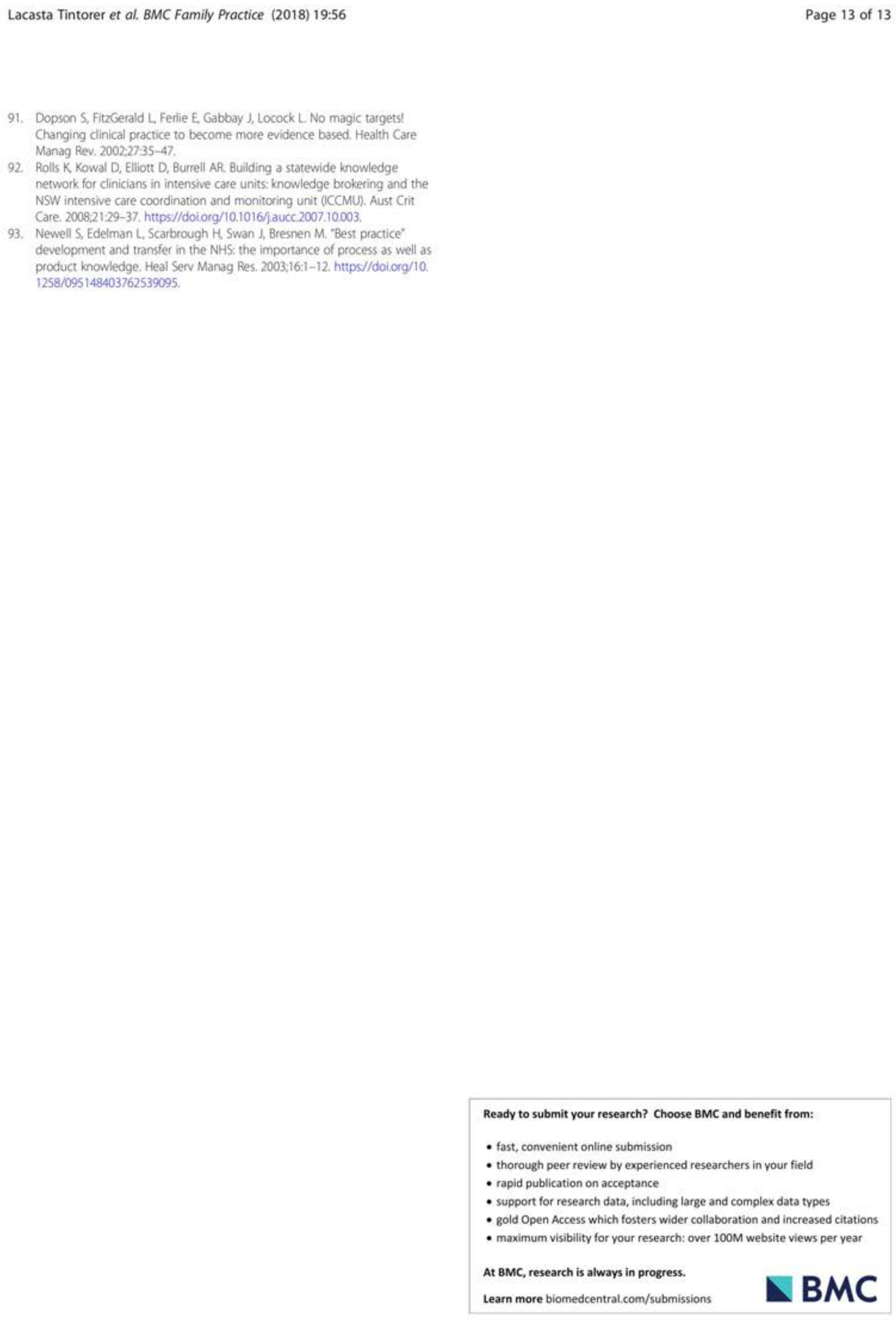

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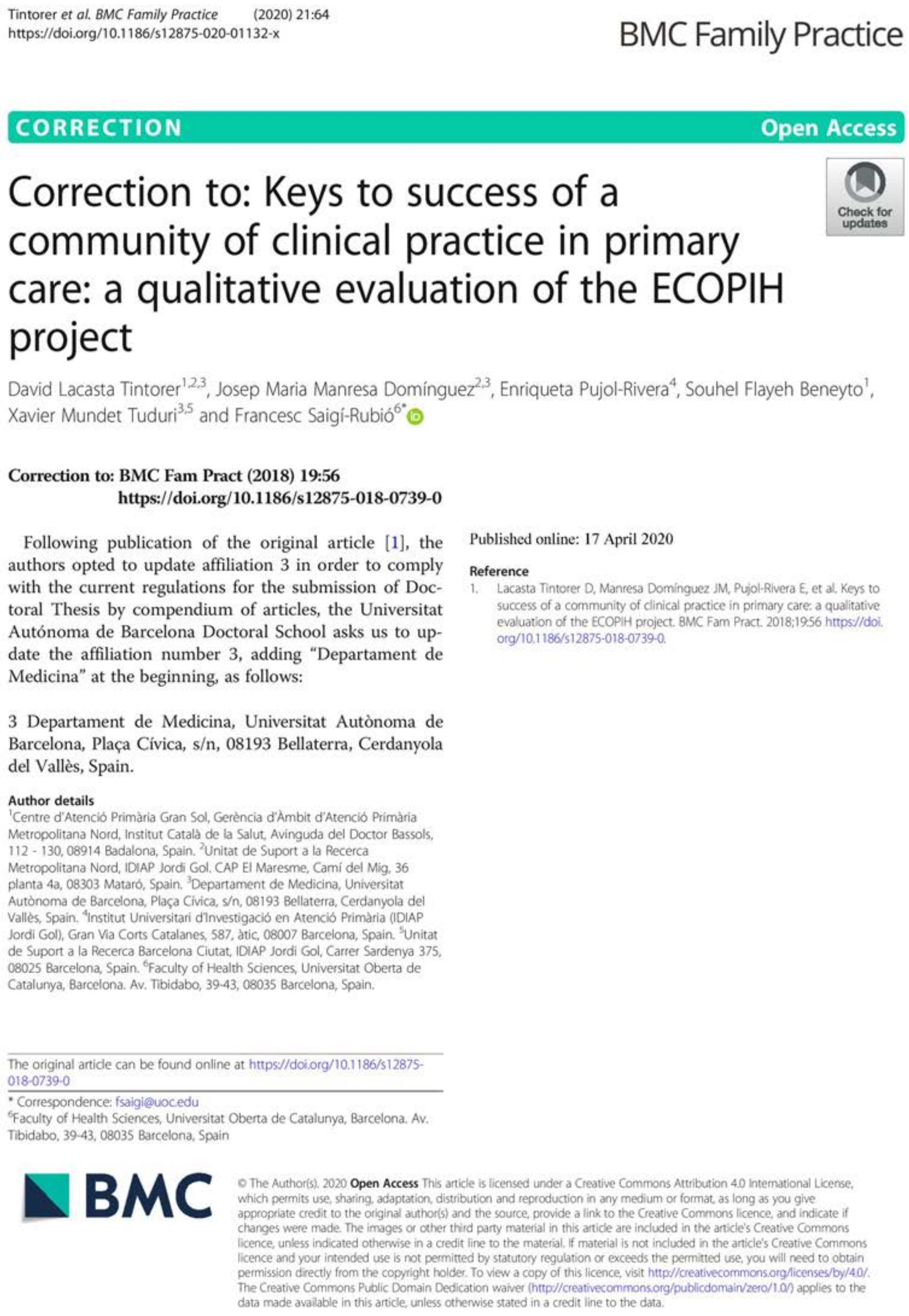

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CORRECTION **Open Access**

Correction to: Keys to success of a community of clinical practice in primary care: a qualitative evaluation of the ECOPIH project

David Lacasta Tintorer[1,2,3], Josep Maria Manresa Domínguez[2,3], Enriqueta Pujol-Rivera[4], Souhel Flayeh Beneyto[1], Xavier Mundet Tuduri[3,5] and Francesc Saigí-Rubió[6*]

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Following publication of the original article [1], the authors opted to update affiliation 3 in order to comply with the current regulations for the submission of Doctoral Thesis by compendium of articles, the Universitat Autónoma de Barcelona Doctoral School asks us to update the affiliation number 3, adding "Departament de Medicina" at the beginning, as follows:

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6.5. Contribución 4. Efficiency as a determinant of loyalty among users of a Community of Clinical Practice: A comparative study between the implementation and consolidation phases.

Lacasta Tintorer D, Manresa Domínguez JM, Jiménez-Zarco A, Rodríguez-Blanco T, Flayeh Beneyto S, Torán-Monserrat P, et al. Efficiency as a determinant of loyalty among users of a Community of Clinical Practice: a comparative study between the implementation and consolidation phases. BMC Fam Pract 2020;21:15. doi:10.1186/s12875-020-1081-x.

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RESEARCH ARTICLE **Open Access**

Efficiency as a determinant of loyalty among users of a Community of Clinical Practice: a comparative study between the implementation and consolidation phases

David Lacasta Tintorer[1,2,3], Josep Maria Manresa Domínguez[2,3], Ana Jiménez-Zarco[4], Teresa Rodríguez-Blanco[3,5], Souhel Flayeh Beneyto[1], Pere Torán-Monserrat[2,6], Xavier Mundet Tuduri[3,7] and Francesc Saigí-Rubió[8*]

Abstract

Background: A community of clinical practice called the *Online Communication Tool between Primary and Hospital Care* (ECOPIH) was created to enable primary care and specialist care professionals to communicate with each other in order to resolve real clinical cases, thereby improving communication and coordination between care levels. The present work seeks to analyse whether ECOPIH makes it possible to reduce the number of referrals. To that end, the objectives are: (1) To find out the degree of loyalty among ECOPIH users, by comparing the medical professionals' profiles in the tool's implementation phase to those in its consolidation phase. (2) To evaluate the degree of fulfilment of users' expectations, by establishing the determining factors that had an influence on the physicians' intention to use ECOPIH in the implementation phase and observing whether its use had an effective, direct impact on the number of patient referrals that primary care physicians made to specialist care professionals.

Methods: Two studies were conducted. Based on a survey of all the physicians in a Primary Care area, Study 1 was a descriptive study in ECOPIH's implementation phase. Study 2 was a randomised intervention study of ECOPIH users in the tool's consolidation phase. The results from both studies were compared. Various bivariate and multivariate statistical techniques (exploratory factor analysis, cluster analysis, logistic regression analysis and ANOVA) were used in both studies, which were conducted on a sample of 111 and 178 physicians, respectively.

Results: We confirmed the existence of an ECOPIH user profile stable across both phases: under-50-year-old women. Regarding the second objective, there were two particular findings. First, the discriminant factors that had an influence on greater ECOPIH use were habitual *Social media website and app use* and *Perceived usefulness for reducing costs*. Second, PC professionals who were ECOPIH members made fewer referrals to SC professionals in Cardiology, Endocrinology and Gastroenterology than older PC professionals who were not ECOPIH members.

Conclusions: The use of a community of clinical practice by primary care and specialist care professionals helps to reduce the number of referrals among medical professionals.

Keywords: Remote consultation, Primary health care, Problem solving, Telemedicine, Referral and consultation, Continuing medical education

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Background

In the current context of healthcare spending containment, the role of primary care (PC) is fundamental because, when managed effectively, it can prevent unnecessary referrals and reduce waiting lists [1–3]. However, people with multiple and complex health problems are cared for in PC clinics [4]. This means that physicians have to deal with several clinical aspects of patients at once; physicians may have doubts about how to manage complex patient needs in day-to-day clinical practice [5–8]. PC professionals therefore need an effective system that allows them to perform searches and find the necessary information to enhance their knowledge and find suitable solutions [9].

Face-to-face or telephone discussions with specialist care (SC) professionals enable PC professionals to address particular clinical concerns that crop up during patient care. However, given that the health system is at saturation point, communication between PC and SC may be difficult, slow, and ineffective [10–13], and it leads to many referrals to SC (hospitalisation or specialist outpatient clinics). In turn, this leads to excessive delays for appointments [14, 15] and to a significant increase in financial, time and psychological costs to physicians and patients. As Horner et al., have pointed out, 65% of referrals are inappropriate and up to 30% of them could be avoided [16].

Among the factors associated with a higher referral rate are the little coordination between care levels and the lack of training [10, 17–19]. Improving coordination between care levels would not only enhance healthcare, but also be of considerable educational value and lead to a more cost-effective use of health services [2, 20]. Telemedicine can improve communication between PC and SC, and thereby improve efficiency, cost-effectiveness, and medical care quality [21–27], with a high degree of patient satisfaction [28–30].. In addition, telemedicine can reduce the number of supplementary tests and referrals to SC (by between 8.9 and 51%) [30–32].

The formation of communities of practice (CoPs) is a recent approach [33]. Applied to the field of healthcare, communities of clinical practice (CoCPs) are online platforms that draw on the advantages of Web 2.0 to construct knowledge among healthcare professionals working at different levels of care [34]. Although there is limited evidence of their usefulness [35, 36], CoCPs have been shown to have considerable capacity to enable the transfer of knowledge gained in day-to-day practice [37–39], as well as a lot of potential in terms of professionals' education, regardless of their care level [36, 40–43].

Set up in 2009, *Eina de Comunicació Online entre Primària i Hospitalària* (ECOPIH as abbreviated in Catalan, or Online Communication Tool between Primary and Hospital Care as translated in English) is a CoCP based on a Web 2.0 platform. It facilitates communication between PC and SC professionals respectively working at a number of PC centres and hospitals in the cities of Badalona and Sant Adrià de Besòs in greater Barcelona, Spain [44]. It enables PC and SC professionals to share up-to-date information that is relevant to their interests, and PC professionals to raise clinical cases for consultation with specialists to improve patient management and to reduce the number of referrals to the next care level. After a two-year follow-up period (2011–2012), 1000 interventions had been made across six specialities through ECOPIH. Contributions had been read 12,200 times (each contribution approximately 10 times) and 209 clinical cases had been raised for consultation.

Presented in this article are the results from two ECOPIH follow-up studies conducted between 2011 and 2012, coinciding with the respective implementation (first year of ECOPIH use) and consolidation phases of that CoCP (end of the second year of use). Study 1 evaluated the discriminant factors that had an influence on the intention to use ECOPIH, and Study 2 performed a characterisation of ECOPIH users and analysed the impact of ECOPIH use on referrals. By comparing the results obtained from the two studies conducted, the present work seeks to analyse whether ECOPIH makes it possible to reduce the number of referrals to SC. To that end, the objectives are (Fig. 1):

(1) To find out the degree of loyalty among ECOPIH users. Specifically, by identifying and then comparing the medical professionals' profiles in the tool's initial implementation phase (Study 1) to those in its consolidation phase (Study 2) to see if they remained stable.

(2) To evaluate the degree to which users' expectations are fulfilled by establishing the determining factors that influence physicians' intention to use ECOPIH in the implementation phase (Study 1) and analysing whether the expectations identified in that phase were fulfilled by observing whether its use had an effective, direct impact on the number of patient referrals that PC physicians made to SC professionals (Study 2).

Methods

The research presented in this article is the result of a collaboration between the Badalona-Sant Adrià de Besòs Primary Care Service (PCS) in Catalonia, Spain, and the Open University of Catalonia (UOC, as abbreviated in the Catalan language), Spain. Some of the results obtained from this study relating to physicians' and nurses' adoption of the tool have been published elsewhere [45].

The Badalona-Sant Adrià de Besòs PCS includes nine PC centres and three SC centres: Germans Trias i Pujol University Hospital, Badalona Municipal Hospital and the Barcelonès Nord International Health Unit, with a

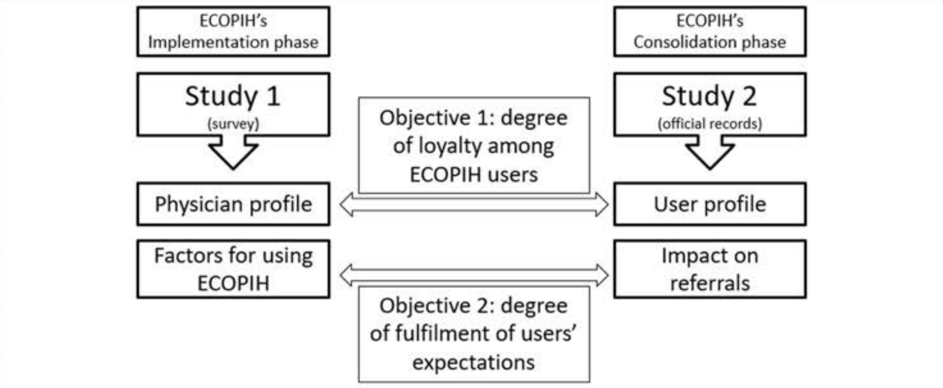
ECOPIH's Implementation phase
ECOPIH's Consolidation phase
Study 1
(survey)
Study 2
(official records)
Objective 1: degree of loyalty among ECOPIH users
Physician profile
User profile
Factors for using ECOPIH
Impact on referrals
Objective 2: degree of fulfilment of users' expectations

Fig. 1 Objectives and results obtained from the two studies conducted in the present work

total of 624 healthcare professionals. These centres serve 227,151 inhabitants.

Two studies were conducted. Study 1 was a descriptive study in ECOPIH's implementation phase. Study 2 was a randomised intervention study of ECOPIH users conducted two years later, when use of the tool had become consolidated.

Study 1 (implementation phase): characterisation of ECOPIH users during the implementation phase and description of discriminant factors that have an influence on the intention to use ECOPIH

Settings, sampling and type of study

Study 1 was a descriptive study on a sample of healthcare professionals from the Badalona-Sant Adrià de Besòs PCS, who had the potential to become regular users of ECOPIH. An anonymous, optional survey consisting of open and closed questions was used to gather data [45].

The questionnaires were divided into three sections: 1) sociodemographic and professional background; b) access to and use of Information and Communication Technologies (ICTs) in professional and personal settings; and c) perceptions and use of ECOPIH. Information about the scientific objectives and data confidentiality was made available to potential respondents. A total of 357 healthcare professionals were invited, by e-mail, to fill in the questionnaire. All of those professionals were (a) involved in caring for patients in the Badalona-Sant Adrià de Besòs PCS and (b) could potentially become routine ECOPIH users. All professionals were invited to take part by e-mail, though it was made clear that they could decline if they wished. The questionnaires were provided in additional files 1 and 2. The study sample was formed by a total of 111 physicians who filled in the questionnaire (31.9% response rate). The study was conducted over a two-month period, from 1 December 2011 to 31 January 2012. As reflected by the above-mentioned percentage, the high response rate meant that it was a representative sample of the ECOPIH community population. Also, given the population's finite size, it was possible to work with low margins of error (+ 7.7, 95% confidence level). This meant that the results could be extrapolated. Table 1 presents the study specifications, and Table 2 the variables used in the study.

Variables of study 1

The use of ECOPIH is a dependent variable and the rest are independent (explanatory) ones (Table 2). It should be pointed out that principal component analysis was used to obtain the two variables measuring perceived usefulness – *Perceived usefulness for improving clinical practice quality*, and *Perceived usefulness for reducing costs*. It was the multidimensional nature of these variables that suggested exploratory factor analysis (EFA) should be performed. EFA is a technique to reduce data dimensionality. By analysing a set of original variables, it seeks to determine the fewest dimensions capable of explaining the maximum amount of information within the data [46].

In total, nine variables were considered for the purpose of extracting the factor dimensions. Each variable was associated with the healthcare professionals' perceived benefits of using ECOPIH. Regarding the particular benefits that ECOPIH could offer its users, some of these variables referred to quality improvement, while others referred to cost reduction (see Table 3 in Lacasta et al. [45]).

Table 1 Study specifications

	Study 1	Study 2
Universe	357 healthcare professionals	357 physicians
Sample	111 physicians	178 physicians
Margin of error	7.7% ($p = q$) 95% confidence level	5.2% ($p = q$) 95% confidence level
Data collection method	Questionnaire	Official or institutional electronic records, from the clinical records management program, 2010 to 2012
Sampling method	Random[a]	Random[b]
Background work	December 2011	December 2012

[a]Based on an anonymous survey.
[b]Randomised intervention study of ECOPIH users.

As the 2015 study showed [45], performing a set of statistical tests enabled us to establish the suitability of the analysis and the reliability of the scale. All of the correlation matrix's variables displayed high correlations, and the value of their determinant was 0.041. The Kaiser-Meyer-Olkin index value was 0.924 and Bartlett's test of sphericity value was 1983.717, with a significance of 0.000. This analysis explained 86.846% of the variance, and Cronbach's alpha values were higher than 0.81 in all the scales. According to Nunnally [47], this indicator must have values higher than 0.7 in general and higher than 0.6 in the case of new scales. Thus, it is possible to assume that the scales used were reliable. In addition, the discriminant, convergent and nomological validity of the content and construct scales was addressed. Regarding the content, the scales were developed following a major review of the literature (see Table 3 in Lacasta et al. [45]).

Table 2 Variables used in Study 1

Model variable		
The use of ECOPIH		The healthcare professional uses ECOPIH. Dichotomous variable, where 0 = no and 1 = yes.
Perceived usefulness of ECOPIH	Perceived usefulness for improving clinical practice quality (PU1)	Metric variable obtained from a principal component analysis (see Annex 2) determining the extent to which the healthcare professionals perceived that ECOPIH use improved clinical practice quality.
	Perceived usefulness for reducing costs (PU2)	Metric variable obtained from a principal component analysis (see Annex 2) determining the extent to which the healthcare professionals perceived that ECOPIH use reduced clinical practice costs (in time and effort invested in getting hold of information).
Perceived ease of use of ECOPIH		Variable measured on a 5-point Likert scale indicating the healthcare professionals' perceived ease of use of ECOPIH.
Security and confidentiality		Variable measured on a 5-point Likert scale indicating the level of patient data security and confidentiality that ECOPIH has.
Healthcare professional profile		Dichotomous variable indicating the individual's professional profile. 1 = physician and 0 = nurse.
ICT user profile	Mobile device use	Categorical variable indicating the extent to which the ICT user uses different types of mobile device. 1 = low, 2 = medium, 3 = high, 4 = very high.
	Social media website and app use	Categorical variable indicating the extent to which the ICT user uses social media technologies (access to social networks). 1 = low, 2 = medium, 3 = high and 4 = very high.
Gender		Gender of the healthcare professional. 1 = female and 0 = male.
Age		Age of the healthcare professionals. The variable has four values: 1 = under 40 years old, 2 = between 40 and 49 years old, 3 = between 50 and 59 years old, and 4 = 60 years old or over.

Source: Lacasta et al. [45]

In order to establish the physicians' profiles, univariate analyses were performed on the different sociodemographic and ICT use variables for the selected sample. An important matter was to identify the physicians' profiles by gender and age. To that end, hierarchical cluster analysis was carried out.

To identify the variables determining ECOPIH use, binary logistic regression analysis (Logit) was performed.

Study 2 (consolidation phase): characterisation of ECOPIH users during the consolidation phase and impact of ECOPIH use on referrals

Settings, sampling and type of study

Study 2 was an open, multi-centre, controlled, randomised intervention study over a 24-month follow-up period. It was conducted on three PCSs in Barcelona Province (Badalona-Sant Adrià de Besòs PCS, SAP Santa Coloma de Gramenet PCS and Maresme PCS), with 25 PC centres and 507 PC physicians, all belonging to the public health system of Catalonia, Spain.

The inclusion criteria were: PC clinicians who had been working for at least 6 months at the same PC centre for whom full patient visit and referral data were available in the official electronic records of the institution. Since only adult medicine specialities were analysed, PC paediatricians were excluded.

The population of 357 physicians at the Badalona-Sant Adrià de Besòs, Santa Coloma de Gramenet and Maresme PCSs was the reference point, from which a sample comprising 178 physicians was taken. It should be noted that this random sample was different from the one used in Study 1, although the study universe was the same – and finite – in both studies.

Variables of study 2

In order to establish the healthcare professionals' profiles, hierarchical cluster analysis was performed, taking into account the *Gender*, *Age* and *ECOPIH member* variables.

The Background work for Study 2 was carried out in December 2012. Table 3 shows the variables analysed in that study.

In order to respond to the first objective, the healthcare professionals' profiles were defined according to the intention to use the CoCP in the implementation phase (Study 1). After the tool's consolidation, the professionals' profiles were analysed again, taking into account the effective use of the tool (Study 2). By comparing the profiles obtained from the two studies, it was possible to find out if potential users had become actual users (loyalty).

Regarding the second objective, in order to confirm whether the tool actually had an influence on the professionals' behaviour, an analysis was performed of the relationship between the profiles of the professionals using ECOPIH (Study 1) and the number of referrals they made in certain specialities (Study 2). Chi-square analysis was used to analyse the relationship of dependence between the variables.

Ethics approval

This project adhered to Spanish legislation (Spanish Law 14/2007 of 3 July on Biomedical Research) and to international regulations on ethical issues (Declaration of Helsinki and Declaration of Tokyo). The research protocol (P11/39) was reviewed and approved by the Ethics and Clinical Research Committee of the Primary Care Research Institute IDIAP Jordi Gol, Barcelona, Spain. All the participants were informed in writing about their participation in the study and data confidentiality. In order to avoid bias, no information about the intervention was provided. Written informed consent was obtained from all participants. Confidentiality was maintained at all levels, thereby ensuring that professionals and patients could not be identified. The patients' medical records could not be accessed from ECOPIH. Information was obtained from the survey responses and existing data related to visits and referrals, and subject-identifying information was coded and anonymised. The features of the intervention meant that it did not have to meet national regulations for clinical trials. Confidentiality was assured under the Spanish Personal Data Protection Law (15/1999 of 13 December).

Results

First objective: to find out the degree of loyalty among ECOPIH users

Implementation phase: sample profile study 1

At the start of ECOPIH implementation, sample distribution by sex and age was fairly balanced: 56.9% women and 43.1% men. Regarding age, 32.4% were under 40

Table 3 Variables used in Study 2

Model variable	
Ecopih member	The healthcare professional is a member of ECOPIH. Dichotomous variable. 0 = no and 1 = yes.
Gender	Gender of the healthcare professional. 1 = female and 0 = male.
Age	Age of the healthcare professional. The variable has four values: 1 = under 40 years old, 2 = between 40 and 49 years old, 3 = between 50 and 59 years old, and 4 = 60 years old or over.
Referrals made	Dependent variable. The number of patient referrals that the PC professional made in the last year. Categorical variable. 1 = low referral rate (fewer than 7 referrals), 2 = average referral rate (between 7 and 14 referrals), 3 = high referral rate (between 14 and 23 referrals) and 4 = very high referral rate (more than 23 referrals).

Table 4 Descriptive statistics of the sample (Study 1)

		Physicians (111)	Profile 1A (64)	Profile 1B (47)
Gender	Female	63 (56.9%)	42 (65.6%)	22 (46.8%)
	Male	48 (43.1%)	22 (34.4%)	25 (53.2%)
Age	< 40 years old	36 (32.4%)	36 (56.2%)	0
	40–49 years old	28 (25.2%)	28 (43.8%)	0
	50–59 years old	33 (29.7%)	0	33(70.2%)
	≥ 60 years old	14 (12.6%)	0	14 (29.8%)
Mobile device use	Low	24 (22.0%)	11 (17.2%)	13 (27.7%)
	Medium	39 (34.9%)	21 (32.8%)	17 (36.2%)
	High	40 (35.8%)	27 (42.2%)	14 (29.4%)
	Very high	8 (7.3%)	5 (7.8%)	3 (6.4%)
Social media website and app use	Low	43 (38.3%)	26 (41.3%)	31 (65.2%)
	Medium	66 (59.8%)	36 (56.6%)	16 (34.8%)
	High	2 (1.9%)	2 (3.2%)	0
Intention to use ecopih	Yes	59 (53.2%)	35 (54.7%)	24 (51.1%)
	No	52 (46.8%)	29 (45.3%)	23 (48.9%)

years old, 25.2% were between 40 and 49 years old, 29.7% were between 50 and 59 years old, and only 12.6% were 60 years old or over. Finally, it should be noted that the large majority's *Mobile device use* was medium-high (70.7%), whereas their *Social media website and app use* was medium (59.8%) or low (38.3%) (Table 4).

As shown in Table 5, the results obtained indicated the existence of two different groups. The first profile (1A) comprised 64 individuals, of whom 65.6% were under-50-year-old women, and the second profile (1B) comprised 47 individuals, of whom 53.2% were over-50-year-old men. The differences between the two groups were significant for both the *Age* variable and the *Gender* variable, with t-test values of 8.708 and 4.437, respectively, at 99 and 95% confidence levels (Table 5).

When analysing each group's relationship with technology, the distribution with respect to *Social media website and app use* was found to be quite homogenous and similar in both, hence the Chi-square value was not significant in either of them.

Consolidation phase: analysis of the ECOPIH users' profiles. Sample profile study 2

As shown in Table 6, the results obtained indicated the existence of two different groups. The first profile (2A) comprised 72 professionals under 50 years old (100%), most of whom were women (76.4%) and ECOPIH members (68.1%), and the second group (Profile 2B) comprised 106 individuals over 50 years old (100%), most of whom were women (62.3%) and not ECOPIH members (85.8%).

The healthcare professionals' profiles obtained from the analysis of the sample in the first year (Study 1, implementation phase) coincided with those obtained in the second year of ECOPIH development (Study 2, consolidation phase). Thus, a professional profile was observed in both the implementation and the consolidation phases (profiles 1A and 2A) corresponding to healthcare professionals who were young, mostly women, and habitual users of technology. In another profile (profiles 1B and 2B in the respective stages), the healthcare professionals were older, mostly men, whose ICT use was lower. This explains why the first segment's use of ECOPIH (profile 1A and 2A) was high (68.1%) and the second group's use of the tool (profile 1B and 2B) was very low (14.2%). We can therefore confirm the existence of an ECOPIH user profile – under-50-year-old women who habitually use ICTs – that was stable in both the implementation phase and the consolidation phase, thus maintaining their loyalty to the tool.

Table 5 Main cluster results at the start of ECOPIH implementation

		Profile 1A	Profile 1B	Significance (t-test)
Age	< 40 years old	62 (56.2%)	0	8.708 (0.004)
	40–49 years old	49 (43.8%)	0	
	50–59 years old	0	78 (70.2%)	
	≥ 60 years old	0	33 (29.8%)	
Gender	Male	38 (34.4%)	59 (53.2%)	4.437 (0.032)
	Female	73 (65.6%)	52 (46.8%)	
Final cluster centres				
Gender		1	2	
Age		1.44	3.30	

Table 6 Main cluster results (Study 2)

		Profile 2A (72)	Profile 2B (106)	Significance (t-test)
Age	< 40 years old	32 (44.4%)	0	43.250 (0.000)
	40–49 years old	40 (55.6%)	0	
	50–59 years old	0	86 (81.1%)	
	≥ 60 years old	0	20 (18.9%)	
Gender	Male	17 (23.6%)	40 (37.7%)	
	Female	55 (76.4%)	66 (62.3%)	
ECOPIH member	Yes	49 (68.1%)	15 (14.2%)	
	No	23 (31.9%)	91 (85.8%)	
Final cluster centres				
Gender		2		2
Age		1.56		3.19
ECOPIH member		1		9

Second objective: to evaluate the degree of fulfilment of users' expectations

Implementation phase: determinants of ECOPIH use

The model's goodness of fit was confirmed by the values and level of significance of the Chi-square statistic (68.228, sig. 0.000) and the Hosmer-Lemeshow test (10.224, $p = 0.250$). In addition, the value of Nagelkerke's statistic indicated that the model obtained explained 62.1% of the dependent variable's variance.

From the analysis in Table 7, it is possible to observe that the variables influencing frequency of use are, on the one hand, the user's profile in terms of his or her frequency of *Social media website and app use* (B = 1.933 $p = 0.002$) and, on the other, *Perceived usefulness for reducing costs* (time and financial costs) that ECOPIH use entails (B = 1.706 $p = 0.025$). No significant differences were found taking into account the professionals' gender or age.

Consolidation phase: impact of ECOPIH on referrals

Table 8 shows that the PC professionals' behaviour was significantly different for three of the specialities analysed. Thus, it was found that, ECOPIH members in PC professions made a low or average number of referrals to SC professionals in Cardiology, Endocrinology, and Gastroenterology, whereas older professionals who were not members of ECOPIH made a high or very high number of referrals. No significant differences were found with regard to the number of referrals made by each group at the start of the study period, so the differences found could be related to ECOPIH use.

For the remaining specialities (Nephrology, Respiratory Medicine and Neurology), no differences were found in the number of referrals. However, it should be noted that the three specialities in which differences were found were those that involved higher total numbers of referrals and healthcare professionals.

Discussion

The analysis of the results of the two studies shown has enabled us to respond to the two stated objectives:

(1) To find out the degree of loyalty among ECOPIH users, and;

(2) To evaluate the degree of fulfilment of users' expectations.

Both objectives are closely related since one of the main reasons why potential users become actual users is the fulfilment of their expectations from the tool.

Table 7 Equation variables (Study 1)

	B	E.T.	Wald	DF	Sig.	Exp(B)
Perceived usefulness for reducing costs (PU2)	1.706	0.761	5.026	1	0.025	5.508
Perceived usefulness for improving clinical practice quality (PU1)	0.793	0.636	1.553	1	0.213	2.211
Perceived ease of use of ECOPIH	−0.075	0.310	0.058	1	0.810	0.928
Security and confidentiality	0.016	0.311	0.003	1	0.958	1.016
Social media website and app use	1.933	0.619	9.748	1	0.002	6.907
Mobile device use	−0.011	0.339	0.001	1	0.973	0.989
Constant	−3.327	1.751	3.612	1	0.057	0.036

Table 8 Referrals in different specialities, by professional profile (Study 2)

Referral rate by speciality		Profile 2A (women, < 50 years old, ECOPIH users)	Profile 2B (men, > 50 years old, non-ECOPIH users)	SIGNIFICANCE (*F* value)
Cardiology	Low	11 (15.3%)	5 (4.7%)	0.023
	Average	7 (9.7%)	6 (5.7%)	
	High	18 (25.0%)	21 (19.8%)	
	Very high	36 (50.0%)	74 (69.8%)	
Endocrinology	Low	18 (25.0%)	10 (9.4%)	0.025
	Average	12 (16.7%)	29 (27.4%)	
	High	21 (29.2%)	29 (27.4%)	
	Very high	21 (29.2%)	38 (36.8%)	
Gastroenterology	Low	9 (12.5%)	5 (4.7%)	0.019
	Average	9 (12.5%)	7 (6.6%)	
	High	17 (23.6%)	16 (15.1%)	
	Very high	37 (51.4%)	78 (73.6%)	
Nephrology	Low	66 (91.7%)	94 (88.7%)	0.635
	Average	6 (8.3%)	11 (10.4%)	
	High	0 (0.0%)	1 (0.09%)	
	Very high	–	–	
Neurology	Low	12 (16.7%)	10 (9.4%)	0.455
	Average	9 (12.5%)	13 (12.3%)	
	High	19 (26.4%)	36 (34.0%)	
	Very high	32 (44.4%)	47 (44.3%)	
Respiratory Medicine	Low	11 (15.3%)	11 (10.4%)	0.443
	Average	15 (20.8%)	17 (16.0%)	
	High	17 (23.6%)	35 (33.0%)	
	Very high	29 (40.3%)	43 (40.6%)	

Regarding the first objective, after comparing the professional profiles in the implementation phase to those in the consolidation phase, two professional profiles were found to remain similar over time. In one profile, the healthcare professionals were young, mostly women, and habitual users of technology. In another, the healthcare professionals were older, mostly men, whose ICT use was lower.

The findings suggest that the degree of loyalty (from initial use to consolidated use) was high among the group of younger female professionals. This seems to be supported by the fact that those professionals in the segment comprising mostly under-50-year-old women who stated their intention to use ECOPIH in the implementation phase were actual members of it two years later.

The results obtained show that the professionals in the over-50-year-old profile were those who used ECOPIH to a lesser extent, as identified in Study 2. This segment bears considerable similarity to Profile 1B observed in Study 1 (except for gender), in which the professionals rated information security higher than cost reduction.

In order to respond to the second objective, the determining factors that had an influence on the use of ECOPIH in the implementation year were analysed. The impact of the tool's use on the number of referrals in an uncontrolled real-life setting was then evaluated, based on the medical professionals' voluntary use thereof. This enabled us to establish whether the expectations created at the start of ECOPIH use (specifically, that PC professionals felt that ECOPIH use would allow costs associated with clinical practice to be reduced), had been fulfilled.

Concerning the factors determining the adoption of ECOPIH, our study revealed that two factors explained physicians' use of this tool. Firstly, professionals' ICT user profiles influenced intention to use ECOPIH (B = 1.933 $p = 0.002$). All professionals, regardless of their age and whether or not they were ECOPIH users, habitually used mobile devices and extensively used social media websites and apps. It is logical to think that those who habitually used social media/online platforms would be more likely to use a CoP in a clinical setting because they are already more comfortable with online platforms. Furthermore, the majority of under-50-year-old professionals would have used ICTs intensively at various stages throughout their higher education and professional development. In contrast, many professionals among the over-50-year-old generation could be classified as late adopters of ICTs, mainly because such adoption occurred in the workplace. Consequently, some professionals were reluctant to use ICTs because they saw it as an obligation and considered them hard to use and not particularly useful.

In the explanation of the physicians' ECOPIH use, second in order of importance was *Perceived usefulness for reducing costs* (time and financial costs). Physicians decided to use the CoCP because they considered that it could become an effective tool for reducing various costs (B = 1.706 $p = 0.025$). Considering time strain, it is reasonable to think that healthcare professionals would opt for the development of more efficient professional activities. Thus, it is understood that the intention to use ECOPIH is conditional upon it being perceived as a tool that enables a correct diagnosis to be made while minimising the amount of time, effort and financial cost involved for both the physicians and the healthcare institutions [9]. However, this tendency appears to be more apparent among younger, especially female professionals than among older male professionals. The setting's cultural history might explain the gender differences between the two groups identified. Thus, the group of older professionals is mostly male because, at the start of the second half of the twentieth century in Spain, women's access to certain types of higher education – such as medicine or engineering – was quite limited. The medical profession underwent a gradual feminisation, meaning that those generations of healthcare professionals trained at the end of the last century included a high percentage of women. In the early twenty-first century, 70% of new medical students were women; this has since risen to 85% [48, 49]. Moreover, the younger generation of professionals is very aware of patients' service experience because of the more active role that patients play in healthcare provision models (empowerment and decision-making) [50] [51].

An important aspect that affects the professionals' decision to use the tool continuously over time is its ability to fulfil the expectations created in the implementation phase. Regarding the impact of the tool's use on the number of referrals in an uncontrolled real-life setting, and as seen in other studies [30], the degree of tool use has an influence on the tool's potential usefulness; this is linked to *Perceived usefulness for reducing costs* (time and financial costs) that ECOPIH use entails. The segment of physicians who predominantly used ECOPIH regularly had lower referral rates in those specialities for which it had been used the most. This particularly reinforces the idea that, for this group of professionals, the tool fulfilled their expectations in terms of its ability to reduce costs associated with clinical practice. These findings are consistent with the results from other studies on the use of telemedicine applied to consultations among professionals [32, 52]. These results indicate that the tool has great potential because we are on the point of a generational changeover. Given today's user profile, use of ECOPIH, and therefore its usefulness, are expected to increase in the near future.

It should be noted that these results were only obtained in three of the six specialities evaluated (Cardiology, Endocrinology and Gastroenterology, and not Respiratory Medicine, Nephrology or Neurology). This is probably due to two reasons. First, the latter three specialities were incorporated into ECOPIH later, and that might have hindered its use. Second, they are specialities in which fewer referrals are made, probably because the most common disorders within them are more protocolised and less individualised, thereby facilitating an independent handling of them by PC professionals.

Finally, the results obtained show that the professionals in the over-50-year-old profile are those who used ECOPIH to a lesser extent and, in turn, made the most referrals. This segment, as identified in Study 2, bears considerable similarity to Profile 1B observed in Study 1 (except for gender), who used ICTs to a lesser extent and rated information security higher than cost reduction. Hence, it can be seen that the number of referrals made remained unchanged.

Limitations

This study has a number of limitations. First, the difficulty of recording the impact of such tools should not be overlooked. The impact of CoCP tools should also take into account the quality of referrals, the physician's trust, and interprofessional communication. Furthermore, use and effectiveness of ECOPIH may have been influenced by other factors not considered in our study. Examples of such factors include: (a) availability of other PC-SC consultation systems; (b) each centre's healthcare workload, and; (c) being or not being a teaching centre for resident physicians. The results obtained from this study need to be complemented by a qualitative evaluation in order to assess the tool comprehensively [37, 53–55].

Second, we are aware that both the number of ECOPIH users (65 members) and the referral rate (number of referrals per professional) limit the study's statistical power. In order to solve both of these problems, we could have conducted a randomised controlled study on one specific group of professionals, that is to say, those who were enthusiastic about and committed to using ECOPIH. If we had done so, results of greater magnitude might have been obtained, though it would have affected the external validity of our study, which was conducted in a real-life setting of clinical practice and gave the professionals the freedom to use the tool as they wished, which we believe is one of the greatest strengths of our study.

Finally, during the study design phase, the inclusion of clinical variables as a measure of the effect of ECOPIH use was considered. That option was ultimately rejected owing to the difficulty of isolating the effect of the tool's use from other influencing factors (e.g., courses taken by the professionals) and of finding a single clinical variable to encapsulate the improved clinical control of patients, since ECOPIH is a platform on which any type of clinical case can be raised for consultation.

Future implications

We believe that further research should be done on the impact of CoCPs for professionals working in different areas of healthcare to communicate with one another, from the perspective of both the financial implications (a reduction in referrals and visits, and cost analysis) and the clinical outcomes. We propose that longer-term follow-ups should be done and that the use of the tool should be more actively promoted and encouraged, while ensuring that its use is never made compulsory [56]. In order to do that, it will be necessary to ensure that the firm managing the tool guarantees its continuity, that users are given time to actually use it, and that solutions to any technological aspects representing barriers to its use are found. As a future strategy, and in keeping with the recommendations of some authors, it might be appropriate to push ahead with the tool's dissemination, presenting it in a way that facilitates its use. This would strengthen the available evidence and the relative advantages of using ECOPIH, which would significantly help to increase its use [57].

Finally, it would be interesting to expand the research by looking into the impact of a CoP in a PC clinical setting as a novel tool for training based on real clinical cases.

Conclusions

ECOPIH and other CoCPs can be used to raise clinical cases for consultation and share information among PC and SC professionals; such tools may reduce the number of referrals to SC. Furthermore, ECOPIH and similar tools offer advantages for clinical efficiency. The potential of the tool increases as more and more young professionals use it. We also believe that its use should be strengthened because of the advantages it offers in terms of efficiency, learning and spreading knowledge.

Supplementary information

Supplementary information accompanies this paper at https://doi.org/10.1186/s12875-020-1081-x.

Additional file 1. Questionnaire to Primary Care professionals.
Additional file 2. Questionnaire to Specialist Care professionals.

Abbreviations

CoCP: Community of clinical practice; CoP: Community of practice; ECOPIH: Eina de Comunicació entre Primària i Hospitalària (Online Communication Tool between Primary and Hospital Care); ICT: Information and communication technologies; PC: Primary care; PCS: Primary Care Service; SC: Specialist care; UOC: Open University of Catalonia

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Authors' contributions

All the authors have made substantive intellectual contributions to a published study. DLT (ECOPIH Community Manager) contributed to research question formulation, literature search, study design, analysis and interpretation of results, and manuscript drafting. JMM participated in study conception and design, acquisition of data, and analysis and interpretation of data, and helped with manuscript drafting. TRB performed statistical analysis and interpreted the findings. AJZ contributed to research question formulation and study design, performed statistical analysis, interpreted the findings and participated in manuscript drafting. SFB (ECOPIH Community Manager) participated in data collection, interpretation and dissemination of results, and helped with manuscript drafting. PTM was involved in critically reviewing the manuscript for important intellectual content, giving final approval of the version to be published, and the collection and analysis of results. XMT participated in protocol design, interpretation of results and article drafting. FSR contributed to research question formulation, study design coordination, literature search, study design, interpretation of results and article drafting. He is the guarantor of the article. All the authors have read, revised and approved the final manuscript.

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Availability of data and materials

All data generated or analysed during this study are included in this published article.

Ethics approval and consent to participate

The research protocol (P11/39) was reviewed and approved by the Ethics and Clinical Research Committee of the Primary Care Research Institute IDIAP Jordi Gol, Barcelona, Spain.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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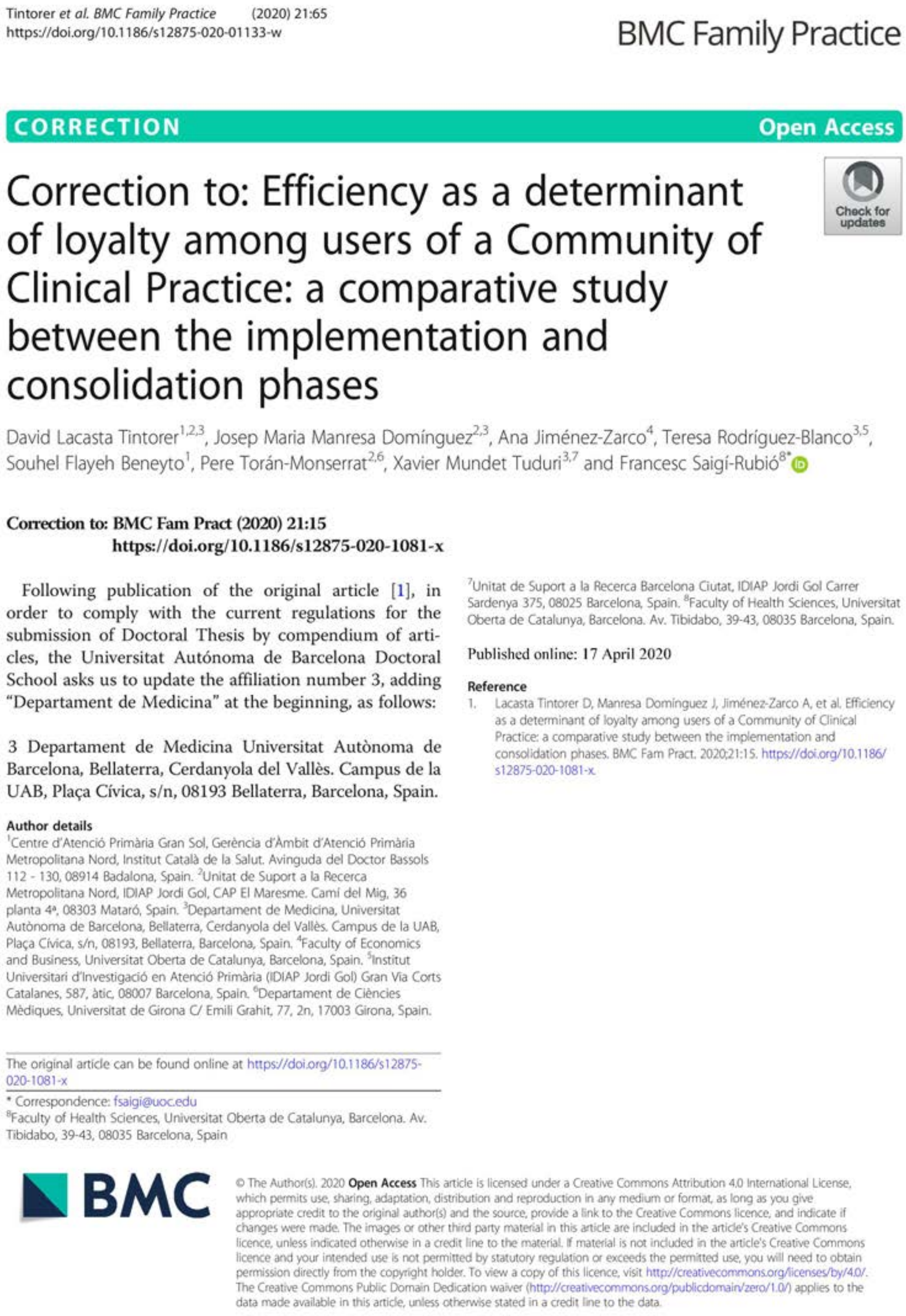

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BMC Family Practice

CORRECTION Open Access

Correction to: Efficiency as a determinant of loyalty among users of a Community of Clinical Practice: a comparative study between the implementation and consolidation phases

David Lacasta Tintorer[1,2,3], Josep Maria Manresa Domínguez[2,3], Ana Jiménez-Zarco[4], Teresa Rodríguez-Blanco[3,5], Souhel Flayeh Beneyto[1], Pere Torán-Monserrat[2,6], Xavier Mundet Tuduri[3,7] and Francesc Saigí-Rubió[8*]

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Following publication of the original article [1], in order to comply with the current regulations for the submission of Doctoral Thesis by compendium of articles, the Universitat Autónoma de Barcelona Doctoral School asks us to update the affiliation number 3, adding "Departament de Medicina" at the beginning, as follows:

3 Departament de Medicina Universitat Autònoma de Barcelona, Bellaterra, Cerdanyola del Vallès. Campus de la UAB, Plaça Cívica, s/n, 08193 Bellaterra, Barcelona, Spain.

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7. Resumen global de los resultados

A continuación se resumen de forma global los principales resultados de los diferentes trabajos realizados, dando respuesta a los objetivos planteados. En referencia a la primera contribución, no se describen los resultados puesto que se trata de la publicación del protocolo del estudio, por lo que no se disponía todavía de ningún dato analizado.

7.1. Factores discriminantes para el uso de ECOPIH entre los profesionales sanitarios (Objetivo secundario 1)

En la Figura 3 se representan las diferentes hipótesis (supuestos) planteadas en este estudio:

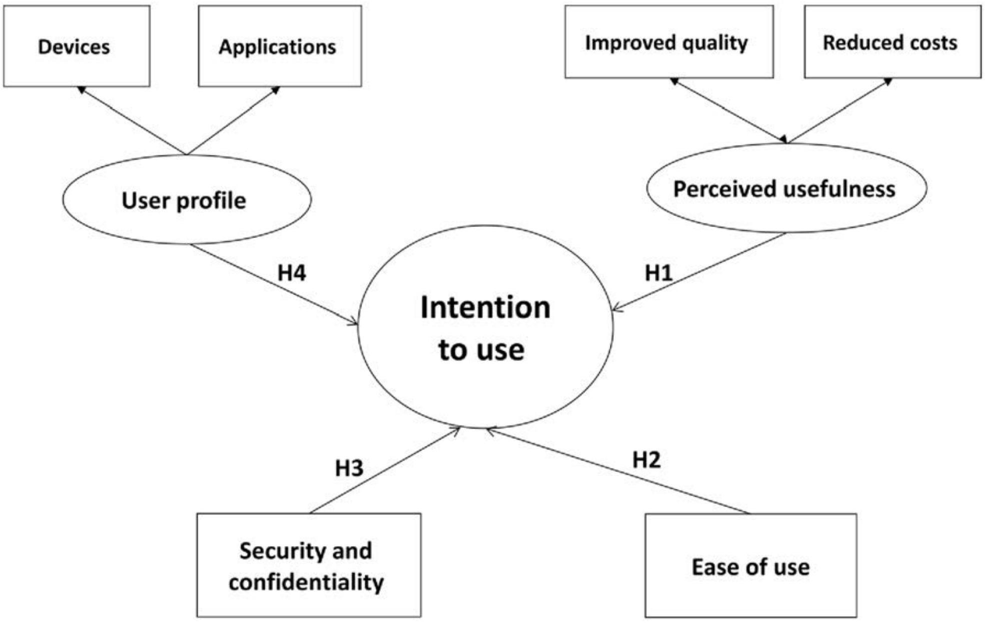

Devices
Applications
Improved quality
Reduced costs
User profile
Perceived usefulness
H4
H1
Intention to use
H3
H2
Security and confidentiality
Ease of use

Figura 3. Determinantes de uso de ECOPIH según modelo TAM.
Fuente: Lacasta *et al* (2015) [105]

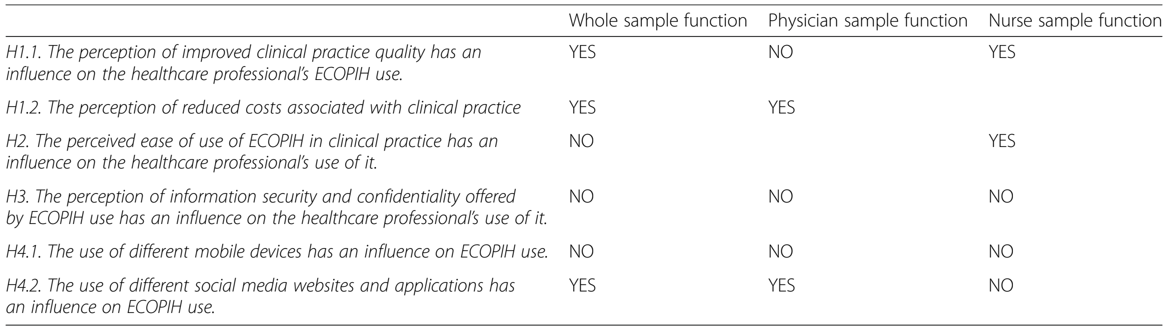
Para el conjunto de los profesionales sanitarios (médicos y enfermeras), la percepción de utilidad para reducir costes asociados a la práctica clínica es el factor con mayor poder discriminante entre los profesionales que usan la plataforma y aquellos que no lo hacen (β = 0.547). El segundo factor en orden de importancia es la percepción de utilidad para mejorar la calidad de la práctica clínica (β = 0.476), y el último es el uso habitual de las redes sociales (β = 0.237). Por tanto, es posible concluir que el Supuesto 1 fue confirmado (página 22). Además, teniendo en cuenta el resultado del uso variable de las redes sociales y el uso de aplicaciones, es posible concluir que se confirmó el Supuesto 4.2 (página 22. Finalmente, dada la falta de significación estadística de los resultados obtenidos, el resto de los supuestos fueron rechazados.

Si analizamos de forma separada cada colectivo, observamos unas diferencias a tener en cuenta. Así, para los médicos, el principal factor discriminante entre usuarios y no usuarios de ECOPIH fue la percepción de utilidad para la reducción de costes (β = 0.943), seguido del uso habitual de redes sociales (β = 0,304). En cambio, para el colectivo de enfermería, los factores discriminantes más significativos fueron la facilidad de uso (β =

0.542) seguido de la percepción de utilidad de la plataforma para la mejora de la calidad de la práctica clínica (β = 0.523). Teniendo en cuenta estos resultados, es posible concluir que los Supuestos 1.2 y 4.2 fueron confirmadas para el colectivo médico, mientras que para las enfermeros se confirmaron los Supuestos 1.1 y 2 (página 22).

En resumen, la Tabla 2 muestra los supuestos aceptados y rechazados para cada una de las muestras.

Tabla 2. Factores discriminantes para el uso de ECOPIH. Confirmación de hipótesis (supuestos). Fuente: Lacasta *et al* (2015) [105]



	Whole sample function	Physician sample function	Nurse sample function
H1.1. The perception of improved clinical practice quality has an influence on the healthcare professional's ECOPIH use.	YES	NO	YES
H1.2. The perception of reduced costs associated with clinical practice	YES	YES	
H2. The perceived ease of use of ECOPIH in clinical practice has an influence on the healthcare professional's use of it.	NO		YES
H3. The perception of information security and confidentiality offered by ECOPIH use has an influence on the healthcare professional's use of it.	NO	NO	NO
H4.1. The use of different mobile devices has an influence on ECOPIH use.	NO	NO	NO
H4.2. The use of different social media websites and applications has an influence on ECOPIH use.	YES	YES	NO

7.2. Opiniones de los profesionales sanitarios acerca de la utilidad de ECOPIH y propuestas de mejoras (Objetivo secundario 3 y 4)

Se identificaron una serie de puntos clave en las entrevistas y grupos focales. El análisis de cada uno de estos ítems y las relaciones entre ellos permitió la creación de un marco explicativo de los puntos clave para el éxito de la plataforma, que se reproduce a continuación (Figura 4).

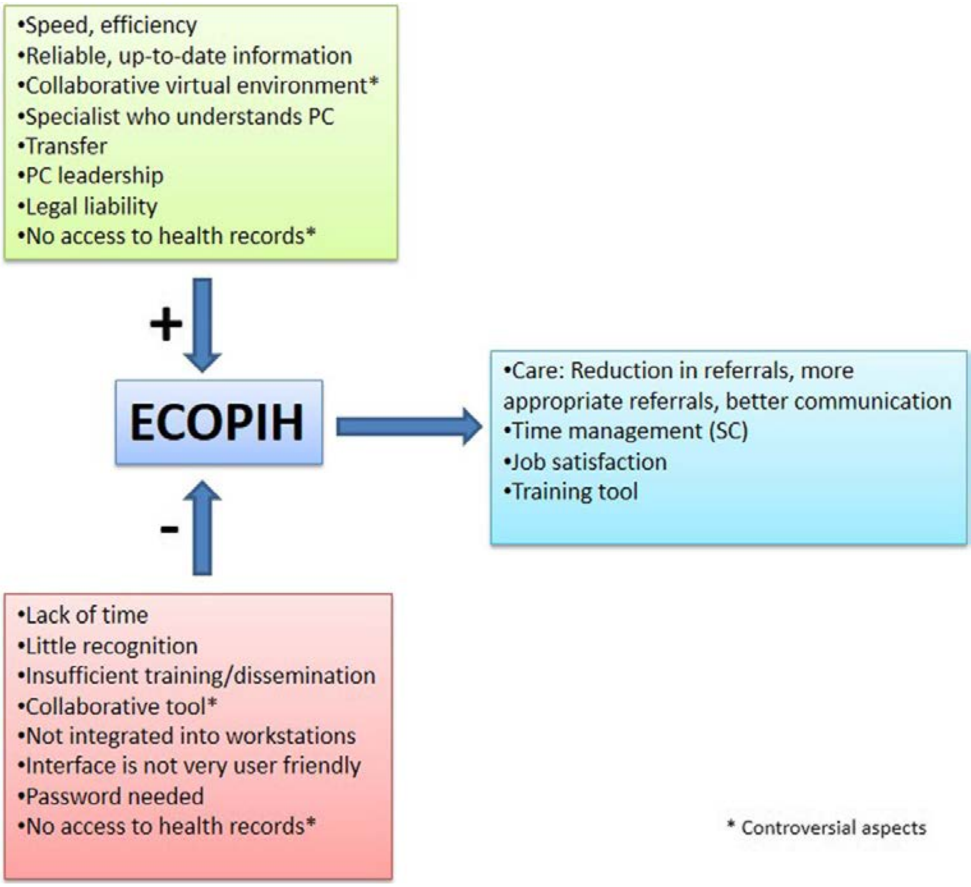

•Speed, efficiency
•Reliable, up-to-date information
•Collaborative virtual environment*
•Specialist who understands PC
•Transfer
•PC leadership
•Legal liability
•No access to health records*
+
ECOPIH
•Care: Reduction in referrals, more appropriate referrals, better communication
•Time management (SC)
•Job satisfaction
•Training tool
-
•Lack of time
•Little recognition
•Insufficient training/dissemination
•Collaborative tool*
•Not integrated into workstations
•Interface is not very user friendly
•Password needed
•No access to health records*
* Controversial aspects

Figura 4. Marco explicativo de ECOPIH. Fuente: Lacasta *et al* (2018) [106]

En resumen, el análisis de las entrevistas mostraba que los usuarios de ECOPIH destacaban la eficacia, rapidez de respuesta y facilidad de acceso a la plataforma. El tipo de información que se obtenía era confiable y actualizada, directamente aplicable a los pacientes reales de una consulta de AP, sobre todo si el especialista era cercano y conocedor del entorno de la AP.

Durante las entrevistas, los profesionales identificaron la necesidad de establecer un acercamiento entre los diferentes ámbitos asistenciales y lograr una cultura de trabajo colaborativo en beneficio de los pacientes. Una plataforma como ECOPIH supera en diversos aspectos otras formas de comunicación entre niveles asistenciales, ya sea clásicas (consultoría presencia, correo electrónico…) o más innovadoras (videoconferencias), sobre todo a nivel formativo.

Los entrevistados consideraron, de forma mayoritaria, que la comunicación con la AE debería darse mediante un entorno virtual, en forma de foro o espacio común dónde compartir los casos. De esta forma, los profesionales de AP comparten sus dudas surgidas de la actividad clínica, y se establece una potente forma de aprendizaje, también mediante la resolución de casos ajenos.

Los profesionales consideraron que la actitud de los usuarios es básica para el éxito de una plataforma de este tipo: proactividad, entusiasmo por adoptar nuevas formas de trabajo y disposición a compartir las propias dudas con el resto de profesionales. En este sentido, se comentó que el grupo de enfermería era menos participativo en este tipo de foros precisamente por adoptar un rol más pasivo, que motivaba que se compartieran menos dudas relacionadas con este colectivo.

En contrapartida, se detectaron una serie de aspectos tecnológicos que dificultaban el uso de la herramienta. Así, el hecho de trabajar con diversas estaciones de trabajo, la necesidad de introducir una nueva contraseña o la limitada usabilidad de la plataforma, son características que se deberían mejorar, según los participantes en el estudio. Los entrevistados propusieron integrar la plataforma en el sistema informático de trabajo habitual de los profesionales (gestor de la historia clínica del paciente), acceder a través de una aplicación del móvil o mejorar el sistema de notificaciones y el acceso a las nuevas aportaciones.

Por lo que se refiere a aspectos organizacionales, la mayoría de los profesionales indicaron que es imprescindible disponer de más tiempo durante su jornada laboral para destinar a la consulta de casos en ECOPIH, aunque algunos entrevistados indicaron que dedicar parte del tiempo personal a formarse o reunir información para resolver casos es algo intrínseco a la profesión médica.

Además, se indicó la necesidad de un mayor reconocimiento de la actividad destinada a esta herramienta, sobre todo entre los especialistas consultores, por ejemplo, con su inclusión como indicador en la Dirección por Objetivos o como actividad asistencial en la cartera de servicios.

Los participantes en el estudio señalaron una serie de beneficios que se derivaban del uso de ECOPIH. La mayoría consideraban la herramienta es eficiente puesto que sería posible reducir el número de derivaciones ya sea por la resolución de los propios casos planteados, o mediante la lectura de casos de otros profesionales que, por tratarse del mismo ámbito de trabajo, serían totalmente aplicables a la propia consulta. En todo caso, los entrevistados hicieron hincapié en que también se podía mejorar la calidad o adecuación de las derivaciones, con pacientes más orientados o con más pruebas complementarias realizadas.

Finalmente, los participantes destacaron que la plataforma ECOPIH ofrecía dos vertientes, asistencial y formativa, las cuales están íntimamente relacionadas, puesto que todo aquello que mejora la formación del profesional repercute en una mejora asistencial (y viceversa). Se trataría de una novedosa formación continuada “a la carta”, basada en casos reales, directamente aplicables a la realidad del médico de AP, incluso en el caso de actuar como mero observador o lector de contenidos.

7.3. Evaluación del grado de fidelización en el uso de la plataforma ECOPIH entre el personal médico (Objetivo secundario 2)

Tanto en las fases de implementación como de consolidación se identificaron dos perfiles (Figura 5). El primero correspondía a médicos que eran jóvenes, en su mayoría mujeres, y usuarios habituales de TICs. En otro perfil, los profesionales sanitarios eran mayores, en su mayoría hombres, cuyo uso de las TICs era menor. En el primer segmento, el uso de ECOPIH fue alto (68.1%) y en el segundo grupo el uso de la herramienta fue muy bajo (14.2%). Estos dos perfiles diferenciados se mantenían constante a lo largo del tiempo (fase de implementación y de consolidación). Por lo tanto, podemos confirmar la existencia de un perfil de usuario de ECOPIH, mujeres menores de 50 años que usaban las TIC habitualmente, que fue estable en las diferentes fases de desarrollo del proyecto, manteniendo así su fidelidad a la herramienta (Tablas 3 y 4).

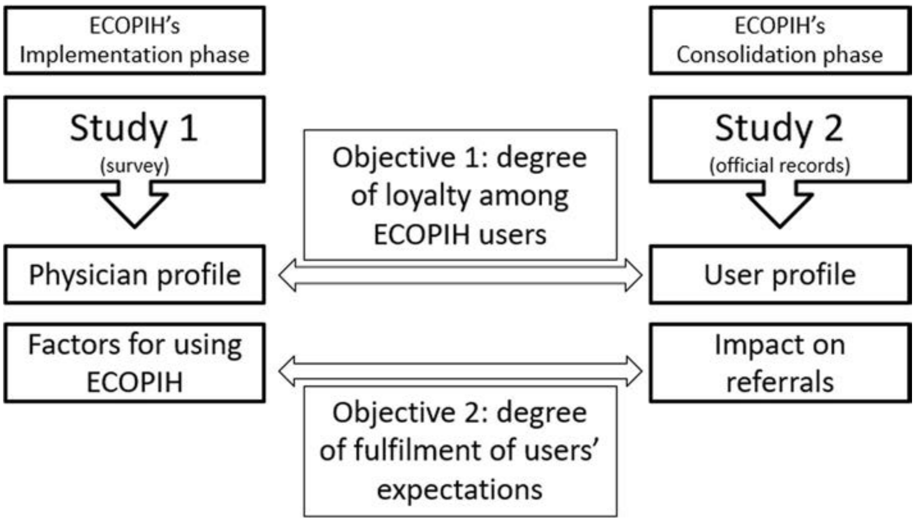

ECOPIH's Implementation phase
ECOPIH's Consolidation phase
Study 1
(survey)
Objective 1: degree of loyalty among ECOPIH users
Study 2
(official records)
Physician profile
User profile
Factors for using ECOPIH
Impact on referrals
Objective 2: degree of fulfilment of users' expectations

Figura 5. Fidelización de los usuarios y reducción de las derivaciones. Resumen de objetivos y resultados. Fuente: Lacasta *et al* (2020)[107]

Tabla 3. Principales resultados del clúster en la fase de implementación de ECOPIH. Fuente: Lacasta *et al* (2020) [107]

		Profile 1A	Profile 1B	Significance (t-test)
Age	< 40 years old	62 (56.2%)	0	8.708 (0.004)
	40–49 years old	49 (43.8%)	0	
	50–59 years old	0	78 (70.2%)	
	≥ 60 years old	0	33 (29.8%)	
Gender	Male	38 (34.4%)	59 (53.2%)	4.437 (0.032)
	Female	73 (65.6%)	52 (46.8%)	
Final cluster centres				
Gender		1	2	
Age		1.44	3.30	

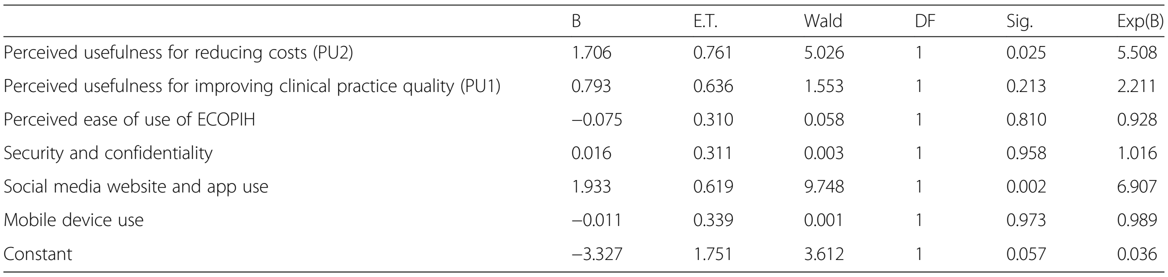
Tabla 4. Principales resultados del clúster en la fase de consolidación de ECOPIH. Fuente: Lacasta *et al* (2020) [107]

		Profile 2A (72)	Profile 2B (106)	Significance (t-test)
Age	< 40 years old	32 (44.4%)	0	43.250 (0.000)
	40–49 years old	40 (55.6%)	0	
	50–59 years old	0	86 (81.1%)	
	≥ 60 years old	0	20 (18.9%)	
Gender	Male	17 (23.6%)	40 (37.7%)	
	Female	55 (76.4%)	66 (62.3%)	
ECOPIH member	Yes	49 (68.1%)	15 (14.2%)	
	No	23 (31.9%)	91 (85.8%)	
Final cluster centres				
Gender		2		2
Age		1.56		3.19
ECOPIH member		1		9

7.4. Impacto en la reducción del número de derivaciones (Objetivo principal)

Según se observa en la Tabla 5, analizando el perfil de médicos usuarios de ECOPIH durante la fase de implementación, se observó que las variables que influían en el uso de la herramienta eran el uso habitual de redes sociales (B = 1.933 p = 0.002) y la percepción de utilidad para reducir los costes asociados a la práctica clínica (B = 1.706 p = 0.025).

Tabla 5. Variables asociadas a un mayor uso de ECOPIH entre los médicos. Fuente: Lacasta *et al* (2020) [107]

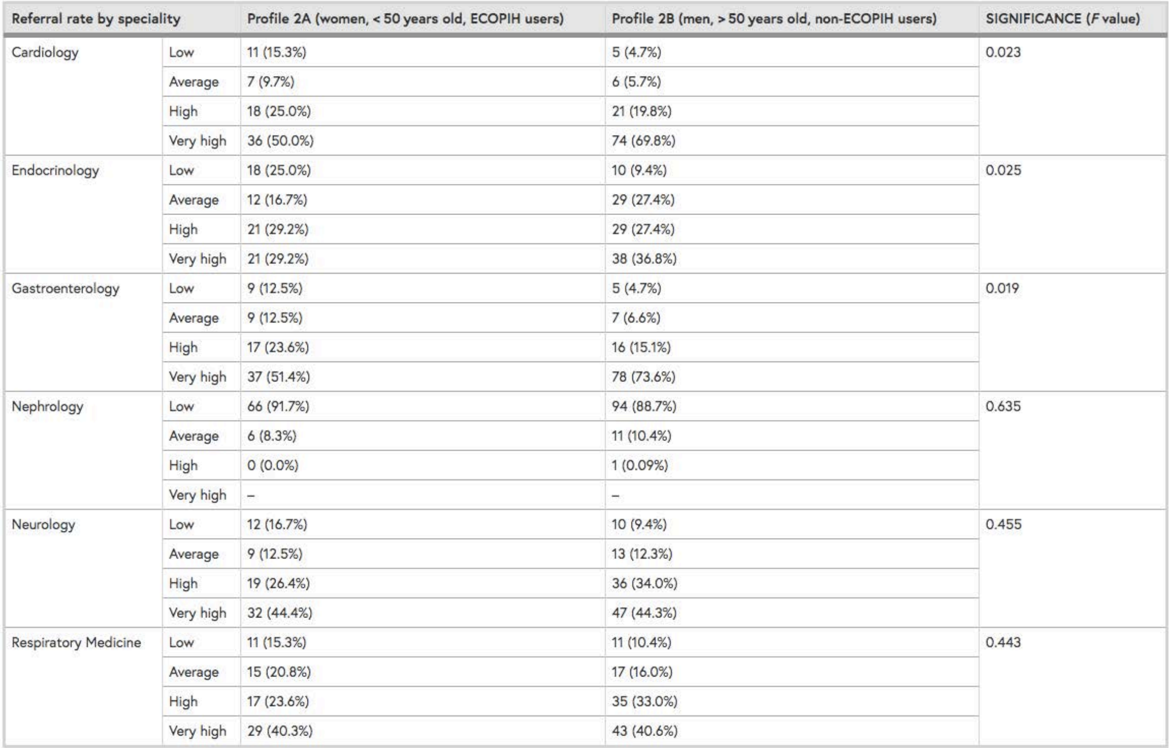


	B	E.T.	Wald	DF	Sig.	Exp(B)
Perceived usefulness for reducing costs (PU2)	1.706	0.761	5.026	1	0.025	5.508
Perceived usefulness for improving clinical practice quality (PU1)	0.793	0.636	1.553	1	0.213	2.211
Perceived ease of use of ECOPIH	−0.075	0.310	0.058	1	0.810	0.928
Security and confidentiality	0.016	0.311	0.003	1	0.958	1.016
Social media website and app use	1.933	0.619	9.748	1	0.002	6.907
Mobile device use	−0.011	0.339	0.001	1	0.973	0.989
Constant	−3.327	1.751	3.612	1	0.057	0.036

Por otro lado, por lo que se refiere al impacto en las derivaciones desde AP hacia el siguiente nivel asistencial, se detectó un comportamiento diferente en función del perfil del médico. Así, los miembros de ECOPIH (mayormente mujeres por debajo de los 50 años) realizaron un menor número de derivaciones presenciales a AE en las especialidades de Cardiología, Endocrinología y Gastroenterología a lo largo del período de estudio. Mientras tanto, el grupo de profesionales mayormente no usuarios de ECOPIH (hombres sobre todo por encima de los 50 años) realizaron un número de derivaciones alto o muy alto. Se confirmaron así las expectativas de los usuarios, quienes efectivamente creían que el uso de ECOPIH podía contribuir a disminuir el número de derivaciones (Tabla 6).

No se encontraron diferencias significativas con respecto al número de derivaciones hechas por cada grupo al comienzo del período de estudio, por lo que las diferencias encontradas podrían estar relacionadas con el uso de ECOPIH. Para las especialidades restantes (Nefrología, Neumología y Neurología), no se encontraron diferencias en el número de derivaciones. Sin embargo, debe tenerse en cuenta que las tres especialidades en las que se encontraron diferencias fueron aquellas que involucraron un mayor número de derivaciones y profesionales de la salud.

Tabla 6. Derivaciones en diferentes especialidades, según perfil del profesional. Fuente: Lacasta *et al* (2020) [107]



Referral rate by speciality		Profile 2A (women, < 50 years old, ECOPIH users)	Profile 2B (men, > 50 years old, non-ECOPIH users)	SIGNIFICANCE (*F* value)
Cardiology	Low	11 (15.3%)	5 (4.7%)	0.023
	Average	7 (9.7%)	6 (5.7%)	
	High	18 (25.0%)	21 (19.8%)	
	Very high	36 (50.0%)	74 (69.8%)	
Endocrinology	Low	18 (25.0%)	10 (9.4%)	0.025
	Average	12 (16.7%)	29 (27.4%)	
	High	21 (29.2%)	29 (27.4%)	
	Very high	21 (29.2%)	38 (36.8%)	
Gastroenterology	Low	9 (12.5%)	5 (4.7%)	0.019
	Average	9 (12.5%)	7 (6.6%)	
	High	17 (23.6%)	16 (15.1%)	
	Very high	37 (51.4%)	78 (73.6%)	
Nephrology	Low	66 (91.7%)	94 (88.7%)	0.635
	Average	6 (8.3%)	11 (10.4%)	
	High	0 (0.0%)	1 (0.09%)	
	Very high	–	–	
Neurology	Low	12 (16.7%)	10 (9.4%)	0.455
	Average	9 (12.5%)	13 (12.3%)	
	High	19 (26.4%)	36 (34.0%)	
	Very high	32 (44.4%)	47 (44.3%)	
Respiratory Medicine	Low	11 (15.3%)	11 (10.4%)	0.443
	Average	15 (20.8%)	17 (16.0%)	
	High	17 (23.6%)	35 (33.0%)	
	Very high	29 (40.3%)	43 (40.6%)	

8. Discusión

La herramienta ECOPIH es una CoPC que permite la comunicación entre profesionales de AP y de AE, con el objetivo de plantear casos clínicos surgidos durante la práctica clínica diaria en los que se generan dudas acerca del manejo de los pacientes. Existen tantos grupos como especialidades activas (más de treinta), y cada grupo dispone de diferentes herramientas: un foro donde se exponen los casos, un repositorio de imágenes (habitualmente para dar apoyo a las consultas mediante fotografías de lesiones cutáneas, electrocardiogramas, radiografías…), otro repositorio de documentos (donde se comparten artículos o protocolos, gran parte de ellos asociados a las respuestas ofrecidas) y finalmente un blog para difundir información clínica de interés para los profesionales sanitarios [99].

En esta tesis doctoral se ha evaluado la herramienta ECOPIH desde diferentes puntos de vista, dando como resultado un conjunto de trabajos publicados que ofrece una visión completa de su potencial, impacto, factores que motivan su uso, así como sus puntos fuertes y débiles a tener en cuenta en futuras experiencias similares.

El conjunto de resultados obtenidos de los cuatro trabajos permite dar respuesta a una serie de cuestiones, cuya interpretación se ofrece a continuación.

8.1. ¿Por qué los profesionales de Atención Primaria utilizan ECOPIH? Factores determinantes, expectativas y grado de fidelización.

Como se ha comentado, la investigación obtuvo tres resultados principales [105,107]. Primero, para el conjunto de la muestra, el principal factor discriminante que diferencia los usuarios de los no usuarios de ECOPIH es la percepción de utilidad para la reducción de costes vinculados con la actividad profesional. Le sigue la percepción de utilidad para la mejora de la calidad de su actividad laboral. La relevancia estadística de estos dos factores discriminantes nos remite, como sugiere el modelo TAM, a la importancia de la percepción de utilidad y facilidad de uso cuando hay que explicar la utilización de una tecnología [108,109]. De la misma forma, en Lacasta *et al* (2015) [110] también se observó que el uso de ECOPIH comportaba una mejora de la práctica clínica y una reducción de las derivaciones, según la opinión de sus usuarios. En este trabajo, que no ha podido ser incluído como publicación en esta tesis doctoral por no cumplir con la normativa que establece la Universitat Autònoma de Barcelona para las tesis por compendio de artículos, se realizó el análisis de una encuesta realizada a 159 profesionales sanitarios sobre el uso de ECOPIH y potenciales beneficios. Se concluyó que cuando el personal sanitario utilizó las redes sociales y las TICs de forma profesional, y cuanto más cerca estaban de los pacientes en su actividad profesional, más probable era que se utilizara una plataforma Web 2.0 para la comunicación entre los profesionales de atención primaria y hospitalaria. Tal uso condujo a una mejor AP y menos derivaciones al hospital.

Estos hallazgos son congruentes con la evidencia disponible en la literatura. Se ha sugerido que el desarrollo de plataformas Web 2.0 para la comunicación entre niveles de atención sanitaria permite resolver los problemas que surgen en la práctica profesional de AP [111]. A este respecto, un metaanálisis realizado sobre la comunicación interactiva entre los médicos de AP y AE en las áreas de psiquiatría y endocrinología encontró que este tipo de comunicación aumentaba la efectividad de la colaboración y se asociaba con importantes avances clínicos en general, y mejores resultados del paciente en particular [112]. Numerosos estudios han evaluado los efectos de la teleconsulta: un estudio mostró que a través de este sistema los médicos lograron evitar hasta el 95% de las consultas de cardiología en pacientes con alto riesgo cardiovascular [28], y otro concluyó que la teledermatología asíncrona (envío de imágenes y visualización diferida) podía reducir el número de derivaciones hasta en un 50%, e incluso en un 69% [113]. La efectividad de la teleconsulta también se ha demostrado en otras especialidades [95,114] y en un estudio finlandés, la teleconsulta con un hospital a través de Internet permitió que el 52% de los pacientes continuaran siendo tratados en el entorno de AP, evitando así su derivación al hospital.

Así pues, según nuestros resultados los médicos deciden usar ECOPIH porque consideran que puede ser una herramienta eficaz para reducir varios costes. Es razonable pensar que los trabajadores sanitarios optarán siempre por el desarrollo de actividades profesionales que sean más eficientes. Por tanto, se entiende que la intención de uso de ECOPIH viene condicionada por la percepción de que la herramienta permite realizar un diagnóstico correcto minimizando la cantidad de tiempo, esfuerzo y coste económico que implica tanto para los médicos como para las instituciones sanitarias [106]. Sin embargo, esta tendencia aparenta ser más significativa entre los jóvenes, especialmente mujeres, que entre los profesionales masculinos mayores. Aspectos culturales podrían explicar las diferencias de género entre los dos grupos identificados. El grupo de profesionales mayores es predominantemente masculino porque en la segunda mitad del siglo XX en España, el acceso por parte de las mujeres a determinados tipos de educación superior (por ejemplo, medicina o ingeniería) era limitado. En cambio, las generaciones de profesionales sanitarios formados al final del siglo pasado incluyen un alto porcentaje de mujeres. A principios del siglo XXI, el 70% de los nuevos estudiantes de medicina eran mujeres. Desde entonces, esto ha aumentado hasta el 85% [115,116]. Además, la generación más joven de profesionales es muy consciente de la experiencia de servicio de los pacientes debido al papel más activo que desempeñan los pacientes en los modelos de prestación de servicios de salud (empoderamiento y toma de decisiones) [117,118]. Por lo tanto, se debe promover el uso de herramientas que logren reducir los costes psicológicos, de tiempo y económicos [119].

En segundo lugar, el análisis discriminante obtiene resultados claramente diferenciados para las muestras de médicos y enfermeras. Para los médicos, el principal factor discriminante es su percepción acerca de la reducción de costes que supone el uso de la herramienta ECOPIH. En cambio, para las enfermeras de AP la discriminación se establece como resultado de sus percepciones acerca de la mejora de calidad en la prestación del servicio y acerca de la facilidad de uso de la herramienta. Esta orientación discriminante distinta es probablemente el resultado de un enfoque diferente para usar la plataforma, como consecuencia de una prestación de servicios de atención que también es diferente. Los médicos, con mayores responsabilidades estratégicas y organizativas dentro de los centros de salud, ven en ECOPIH una plataforma útil en el proceso de toma de decisiones y reducción de costos, en un momento de evidentes dificultades para el sistema de salud. Por el contrario las enfermeras, cuyo enfoque de atención al paciente es más pragmático, califican mejor en los ítems relacionados con la mejora de la calidad de la práctica clínica y de facilidad de uso de la plataforma.

En relación con este aspecto, y para ampliar el estudio de estas impresiones subjetivas de los usuarios, se realizó un estudio cualitativo que obtuvo resultados similares [106]. La mayoría de los entrevistados consideraron que ECOPIH disminuye el número de derivaciones, ya sea porque permite resolver la duda que motiva la derivación o por la lectura de casos planteados con anterioridad, que conduciría a un mejor manejo de los pacientes en AP y, por consiguiente, una reducción de las derivaciones y de las visitas en AE. Este dato es importante, puesto que la intensidad de uso de la plataforma tiene una influencia en su potencial utilidad, y éste tiene relación con la percepción de utilidad para reducir costos (de tiempo y económicos) [120].

Además, y de forma congruente con los resultados hallados en el resto de artículos que completan esta tesis doctoral, se detectó que de acuerdo con los usuarios de esta CoPC, ECOPIH les permite reducir el número de derivaciones y mejorar su adecuación. Asimismo, fruto de la mejora de la comunicación entre niveles asistenciales, se logra una mayor tranquilidad y confianza en el manejo de los pacientes, lo cual conlleva una mejora en la satisfacción laboral del profesional de AP y AE.

Finalmente, el uso habitual de sitios web y aplicaciones de redes sociales es de importancia secundaria en la configuración de los factores discriminantes del uso de ECOPIH por parte de los médicos. Aunque algunos médicos parecen reacios a utilizar las aplicaciones de redes sociales, se necesitan nuevos modelos para mantenerse al día y compartir el conocimiento con otros profesionales debido a la gran cantidad de conocimiento médico requerido para la atención del paciente en el campo de la AP [79]. Por lo tanto, es razonable suponer que los médicos buscan cada vez más alternativas para compartir información, y las CoP clínicas podrían proporcionar un medio eficiente y efectivo para lograrlo. En este sentido, en Lacasta *et al* (2015) se hallaron resultados en la misma línea, confirmándose que el uso profesional de redes sociales y TICs, y la cantidad de horas de contacto con los pacientes, explicaron la intensidad del uso de la plataforma Web 2.0. En este punto se debe tener en cuenta que la mayoría de la generación de profesionales menores de 50 años habrá usado las TICs de una forma intensa en diferentes momentos de su formación y desarrollo profesional. En contra, muchos profesionales mayores de 50 años pueden ser clasificados como adoptantes tardíos de las TICs, principalmente porque esta adopción se ha producido en el lugar de trabajo, de forma similar a los resultados hallados en el análisis de otras plataformas virtuales de consulta de casos, como Medscape Consult [121]. De forma añadida, algunos profesionales son reacios a usar las TICs porque las perciben como una obligación, además de difíciles de usar y que ofrecen poca utilidad.

Mientras que en la mayoría de investigaciones publicadas sobre la teleconsulta y la transmisión de información queda limitada a los médicos de asistencia primaria y especialistas, sin permitir la participación de otros profesionales, nuestra investigación aporta aquí nueva evidencia al constatar que esta percepción de utilidad varía en función del colectivo profesional. Estos resultados revelan la necesidad de un enfoque dinámico en el diseño de la utilización de herramientas de comunicación on-line entre profesionales de asistencia primaria y especialistas, especialmente cuando se dirigen a una variedad de usuarios finales. En este contexto, la creación de CoPC han demostrado ser útiles para solucionar problemas y mejorar el funcionamiento de las organizaciones sanitarias [122].

En cuanto al grado de fidelización, se observó que los perfiles profesionales durante la fase de implementación y la fase de consolidación fueron coincidentes, es decir, se mantenían estables a lo largo del tiempo. De hecho, se observó la existencia de un perfil profesional joven, y mayoritariamente femenino, que usaba las tecnologías de forma habitual, y por otro lado, encontramos el profesional de mayor edad, –en este caso no mayoritariamente masculino– y cuyo nivel de uso de las TIC fue inferior. Este hecho nos llevó a considerar que el grado de fidelización (de uso inicial a uso consolidado) era elevado. Además, es reafirmado por el dato que aquellos profesionales en el segmento constituido mayormente por mujeres menores de 50 años que declararon su intención de usar ECOPIH en la fase de implantación, eran miembros de la plataforma dos años más tarde. Por otro lado, el perfil de los profesionales de más de 50 años son los que en menor medida hacen uso de ECOPIH, lo cual señalaba la importancia de la seguridad en la información por encima de la reducción de costes. No se han hallado referencias bibliográficas que analice este aspecto.

8.2. ¿Se han alcanzado los objetivos asistenciales, es decir, la reducción de las derivaciones?

Un importante aspecto que afecta a la decisión de los profesionales en el momento de usar la herramienta a lo largo del tiempo es la capacidad de cumplir con las expectativas creadas en la fase de implementación, en concreto con relación a la reducción de las derivaciones.

Era necesario, por tanto, evaluar si efectivamente, el uso de la herramienta tenía un impacto en el número de derivaciones en un entorno real no controlado. Así pues, el hallazgo principal de esta tesis doctoral es que el segmento de médicos que usaban ECOPIH de forma regular tenía una menor tasa de derivaciones en aquellas especialidades en las que más se había utilizado. Este hecho refuerza la idea que, para este grupo de profesionales, la herramienta cumple con las expectativas creadas en términos de capacidad para reducir los costes asociados a la práctica clínica. Estos hallazgos son consistentes con los resultados de otros estudios acerca del uso de la telemedicina aplicada a las consultas entre profesionales [49,59].

Por otro lado, los resultados obtenidos muestran cómo el perfil de los profesionales de más de 50 años son los que hacen un menor uso de ECOPIH, como ya se ha comentado anteriormente. Además, se observa cómo el número de derivaciones realizadas por este grupo se mantiene sin cambios. Este segmento, identificado de forma similar en las dos fases (implementación y consolidación), priorizaba la importancia de la seguridad en la información, frente a la reducción de costes o la mejora de la eficiencia de la actividad profesional.

A pesar de que no se observe este hecho para todos los profesionales, probablemente porque se ve enmascarado por la escasa utilidad para el resto de grupos de usuarios, estos resultados indican que la herramienta tiene un gran potencial, puesto que nos encontramos en un momento de cambio generacional, y por el perfil actual de usuarios se espera que en un futuro cercano se aumente su uso y, por tanto, su utilidad, a medida que la mayor parte de los profesionales en activo sean aquellos que adoptaron las TIC en una etapa más prematura de su formación o desarrollo profesional.

Conviene comentar que estos resultados sólo se han obtenido en tres de las seis especialidades evaluadas (cardiología, endocrinología y digestología) y no en neumología, nefrología o neurología. Esto probablemente se deba a dos motivos. En primer lugar, estas tres últimas especialidades se incorporaron más tarde a ECOPIH y eso puede haber lastrado su uso. En segundo lugar, son especialidades en las que se realizan menos derivaciones, probablemente porque las patologías más frecuentes que contienen son más protocolizables y menos individualizables, facilitando así el manejo de forma autónoma por parte de los profesionales de AP.

Por tanto, podríamos decir que las expectativas que los usuarios de la plataforma mostraban durante la fase de implementación, es decir la reducción de costes, se ven cumplidas durante la fase de consolidación. Parece confirmarse que el segmento de profesionales médicos formado mayoritariamente por mujeres con menos de 50 años y que declararon su intención de utilizar la herramienta ECOPIH, es el que, de forma efectiva, dos años más tarde, sigue mostrándose fiel al uso de la plataforma y continúan siendo usuarios activos.

Estos dos factores resaltan los dos aspectos diferenciales de ECOPIH, y que creemos que son su fortaleza. Por un lado, su gran utilidad para el manejo de situaciones clínicas, demostrado por el hecho que disminuye las derivaciones; y por otro, el aspecto social que es consustancial al uso de esta plataforma, avalado por el hecho que es mayormente usada por profesionales ya habituados en el manejo de las redes sociales. Estas características van en la línea de otro tipo de sistemas novedosos de resolución de dudas en relación con el manejo de pacientes, en las cuales se puede obtener una rápida respuesta a las dudas consultando el caso a numerosos colegas (concepto “crowdsourcing medical expertise”) incluso de otros países (mediante una página web o una aplicación de móvil), lo cual podría ser de utilidad para la resolución de casos clínicos complejos o para disminuir los errores diagnósticos, especialmente entre los médicos jóvenes [121,123].

8.3. ¿Qué fortalezas tiene esta herramienta de consultoría?

Para detectar aquellos aspectos que suponen la mayor fortaleza de esta CoP, analizamos con detalle la información extraída del estudio cualitativo que realizamos mediante una serie de entrevistas a profesionales de AP y AE, tanto médicos como enfermeras.

Primero de todo, los usuarios entrevistados destacaron que la herramienta ECOPIH aportaba información rápida, práctica y fiable, cosa que en numerosos estudios se ha observado es primordial para los profesionales de AP dada la multitud de dudas en la práctica clínica diaria [5,10,12,18,19,27]. No hay que olvidar la necesidad que tienen los profesionales sanitarios de acceder a fuentes de confianza, así como la dificultad de la literatura científica para responder directamente preguntas clínicas surgidas de la práctica diaria [11,14,26], por lo que ECOPIH ayuda a salvar estas dificultades. A ello contribuye de forma definitiva el hecho que el especialista consultor conozca el contexto en el que trabajan los médicos de AP, y más aún si es el profesional de referencia de la zona de AP donde se derivan los pacientes, hecho destacado también por parte de los entrevistados. Además, la rapidez con la que se obtiene una respuesta de los consultores en ECOPIH es una característica que tiene mucha importancia para los usuarios, permitiendo otros usos a nivel de resolución de casos clínicos complejos [121].

En segundo lugar, en opinión de los profesionales participantes, el distanciamiento entre AP y AE puede ser resuelto mediante el establecimiento de herramientas de comunicación virtual como ECOPIH, de forma similar a los hallazgos en otros trabajos [29–31,124]. Nuestra plataforma incluye en la comunicación entre profesionales el concepto de web 2.0, y lo hace a través de una CoPC, causando un cambio en la forma cómo se gestiona el conocimiento habitualmente. Según Soubhi (2010) y de Jong (2016), las CoPC pueden ser especialmente útiles en AP donde la flexibilidad y la coordinación permanente son aspectos clave en la atención a pacientes con importante multimorbilidad [73,125], puesto que proporcionan un modelo útil para la gestión del conocimiento y también un mecanismo que facilita y promueve una nueva forma de trabajar y aprender con base en el trabajo colaborativo y el uso de la inteligencia colectiva [126]. Los sistemas de interconsulta virtual de profesional a profesional están siendo utilizados en diferentes países, contando con la satisfacción de los usuarios, quienes consideran que mejoran el manejo de los pacientes [127], aumentando el valor de la práctica clínica [128] e incrementando el conocimiento médico [129]. Diferentes revisiones sistemáticas han hallado resultados similares [130,131].

En tercer lugar, y según la literatura científica, un factor clave para el éxito de un proyecto de telemedicina es que el liderazgo recaiga en profesionales clínicos [60,98,132]. En nuestro caso, la experiencia ha sido liderada por dos profesionales de AP (el autor de esta tesis doctoral y un enfermero del mismo centro de trabajo), quienes conocían a la perfección la realidad de los profesionales de este ámbito y sus necesidades, hecho que les ha permitido adaptar la herramienta tanto a nivel técnico como organizativo. Todo ello conlleva una serie de beneficios intangibles (confianza, homogeneidad de protocolos…), detectados en numerosas ocasiones en las entrevistas realizadas, así como en trabajos previos [126,133,134], constituyendo así otro punto fuerte a destacar de la herramienta.

En cuarto lugar, creemos interesante destacar la gran utilidad de ECOPIH como herramienta de gestión del tiempo para el profesional de AE, ya que le permite decidir el tiempo que se destina a la comunicación con AP al evitar interrupciones y consultas repetidas. Además, el hecho que exista un repositorio de consultas accesible para los profesionales antes de hacer la consulta, ayuda a evitar la repetición de casos similares planteados previamente, permitiendo un mayor ahorro de tiempo al médico consultor, que a menudo recibe varias consultas por un mismo tipo de caso. Esto aspectos no han sido analizados en ningún trabajo previo.

Finalmente, en quinto lugar, se debe destacar que la herramienta ECOPIH posee una vertiente formativa muy potente, combinando cuatro aspectos que, a nuestro juicio y de acuerdo con la evidencia científica actual, son esenciales:

- aprendizaje entre iguales con la presencia de un experto [76]
- aprendizaje a partir de casos clínicos reales directamente aplicables a la práctica clínica [80,81,124]
- diseminación del conocimiento a toda la comunidad (incluso sin una participación activa, “efecto mirón” o “lurkers”) [135]
- interacción social, que es una de las vías principales mediante las que los profesionales sanitarios generan su propio conocimiento tácito de [45,136–140]

Como en cualquier CoP, los médicos noveles aprenden mediante la interacción con los expertos, que a su vez también pueden adquirir nuevas habilidades, y además se crea un conocimiento colectivo disponible para la comunidad a lo largo del tiempo [75–77]. También aprenden juntos focalizándose en problemas que son directamente relacionados con su trabajo, hecho que aumenta la motivación de los participantes, dado que su aprendizaje está ligado a situaciones problemáticas que pueden “reconocer” y percibir como reales y aplicables a su trabajo [80–82]. Por todo ello, la plataforma ECOPIH ofrece ventajas tanto desde el punto de vista asistencial como formativo, ya que su utilidad no se limita a la resolución de un caso concreto, sino que tanto los consejos del especialista como la bibliografía que se adjunta permiten la resolución de casos similares por parte de otros compañeros. La acumulación de experiencias aumenta no sólo el conocimiento explícito del grupo, sino también su conocimiento tácito o práctico, que emerge a través de la práctica reflexiva y la recopilación y el intercambio de casos entre los profesionales [73].

8.4. ¿En qué aspectos es mejorable este sistema de comunicación?

A continuación se enumeran los aspectos que limitan la funcionalidad y utilidad de la herramienta.

Primero de todo, la falta de tiempo ha sido identificada frecuentemente por los participantes como el principal factor que limita el uso de la herramienta ECOPIH para la resolución de las dudas. El uso de herramientas de comunicación virtual como ECOPIH demanda cambios organizativos que permitan disponer de este tiempo de forma regular, tanto para los profesionales de AP como de AE. Aunque la participación en una CoP se produce en parte porque tiene un valor para los propios usuarios, más allá de que se trate de un mandato institucional [103,135,141], es necesario que la institución apueste por la herramienta incorporándola en la cartera de servicios [142] y ofreciendo un reconocimiento a sus participantes, especialmente los consultores [80,143]. No obstante, hay que tratar este último tema con prudencia, puesto que ciertos incentivos de uso -como las DPOs– pueden constituir una barrera para su utilización. Por otro lado, la barrera del tiempo también puede ser superada mediante la capacitación [59,63], la promoción de la potencial utilidad de la herramienta, aumentando los contenidos de valor y mejorando los aspectos tecnológicos [76,79]. Más investigación es pertinente en este campo [144].

En segundo lugar, este punto enlaza con las cuestiones tecnológicas. Idealmente, y de forma coincidente con la literatura científica, la plataforma debería estar integrada en la estación de trabajo habitual, sin necesidad de introducir una nueva contraseña [52,59,91,122], con una interfase amigable [132] y una serie de características técnicas que simplifiquen su uso (disponer de un buscador o de filtros de información, una aplicación móvil…) [14,19,26,34]. Aunque es un aspecto que genera controversia, en general se considera que no es necesario tener acceso a la historia clínica del paciente para no restar agilidad al uso de ECOPIH. De todas formas, en caso de que técnicamente fuese posible, sería interesante disponer de un enlace opcional mediante el cual, previa introducción de contraseña y en un entorno seguro, se pudiese acceder al historial del paciente en casos concretos.

En tercer lugar, la preocupación en cuanto a la responsabilidad legal que se pueda derivar del consejo aportado por un especialista a través de la aplicación virtual ha sido detectada en diversos estudios, sobre todo entre los miembros de AE [40,48,49,57,62,132,145]. Aunque a menudo las consultas virtuales son consideradas como consultas informales, existen una serie de peculiaridades que implican que esta legalidad sea compleja y deba ser revisada antes de su implementación [143]. En el caso de ECOPIH no ha sido un tema conflictivo, puesto que de entrada se estableció por escrito que la responsabilidad del manejo del paciente recaía en el profesional de AP, y así se explicitaba durante la formación y de forma visible en la propia herramienta.

8.5. Recomendaciones para futuras herramientas de teleconsulta entre profesionales

En el momento en que se ideó y se diseñó la plataforma, el objetivo inicial por parte de los impulsores del proyecto era, principalmente, facilitar la gestión de las dudas surgidas durante la práctica clínica de un profesional de AP. Se creía que, en consecuencia, era posible que las derivaciones des de AP a AE se viesen reducidas, puesto que el profesional del primer nivel asistencial dispondría de más herramientas que mejorarían el grado de resolución de los problemas de los pacientes.

Con el objetivo de confirmar estas hipótesis, se procedió a diseñar y llevar a cabo una serie de investigaciones, el fruto de las cuales es la presente tesis doctoral.

El conjunto de resultados obtenidos, contextualizados en la evidencia científica más reciente, permite ofrecer una serie de recomendaciones aplicables a futuras experiencias de telemedicina, sobre todo pero no exclusivamente a aquellas dirigidas a la comunicación entre profesionales

De entrada, se puede concluir con seguridad que el uso de una CoPC, es decir, un foro común donde consultar casos clínicos con los médicos especialistas de referencia, disminuye el número de derivaciones desde AP al segundo nivel asistencial. Esto no se ha detectado en todas las especialidades analizadas, sino sólo en aquellas que se han utilizado más. Por lo tanto, es importante diseñar estrategias para el aumento de uso de este tipo de herramientas, ya que su utilidad (eficiencia) viene determinada por el grado de uso de los profesionales.

Además, estos hallazgos se han detectado sobre todo en un grupo determinado de profesionales, siendo aquellos que son mujeres, menores de 50 años y usuarios habituales de las TICs, los que más utilizan la herramienta y en los que se puede observar un mayor impacto. Este hecho permite ser optimistas en cuanto al futuro a medio plazo de este tipo de plataformas, puesto que pensamos que a medida que se vayan incorporando a la profesión aquellas personas en las cuales el uso de las tecnologías ha sido implícito a su formación como profesional sanitario, el uso de este tipo de CoPC será mayor, y por tanto también será mayor su impacto. Aun así, sería aconsejable diseñar programas o estrategias para favorecer el uso de las herramientas de telemedicina entre el colectivo que han adoptado las nuevas tecnologías a lo largo de su vida profesional y que tienen más dificultades para incorporarlas en su actividad laboral habitual.

Por otra parte, es importante resaltar la labor formativa que es inherente a ECOPIH. Es decir, más allá de que se vea reflejada su utilidad en la reducción de las derivaciones, existe un amplio consenso entre los usuarios de esta plataforma en que se trata de una novedosa estrategia de autoformación, basada en casos reales, totalmente equiparables a los pacientes que se pueden visitar en consulta. Sería interesante diseñar alguna estrategia de investigación que permitiese ampliar el estudio de estos aspectos.

De cara a futuros proyectos de CoPC, se puede concluir que para lograr una mayor sostenibilidad a largo plazo es necesario contar con el apoyo de las instituciones, quienes deberían permitir una sostenibilidad de la plataforma a largo plazo, a la vez que debe proporcionar a los profesionales sanitarios las condiciones óptimas para una mayor utilización: disponer de tiempo específico y establecer un sistema de reconocimiento de esta actividad.

8.6. Fortalezas de la investigación

El trabajo presentado en esta tesis doctoral tiene una serie de fortalezas que aumentan el valor de los resultados obtenidos.

La característica más importante de esta investigación es que está realizada en un entorno de utilización real de la plataforma. Es decir, en ningún momento se incentivó su uso como parte del proceso de investigación, sino que los profesionales utilizaron ECOPIH en función del interés que les generaba y su potencial utilidad en la práctica clínica del propio usuario. A partir de este uso voluntario, basado en motivaciones asistenciales y formativas, se analizó el impacto en las derivaciones. Dado que se estableció un grupo control formado por los profesionales que decidieron no utilizar la herramienta, se pudo comparar la intervención controlando los diversos factores de confusión que pudieran alterar los resultados (por ejemplo, si desde la organización sanitaria se impulsó un plan de mejora centrado en la disminución de las derivaciones, se realizó alguna formación o se implementó algún cambio en los circuitos que pudieran afectar a las derivaciones, estas acciones afectarían por un igual a todos los trabajadores, tanto usuarios como no usuarios de ECOPIH). Estos factores permiten que las conclusiones obtenidas puedan ser fácilmente aplicables a otros proyectos de telemedicina, en concreto centrados en la comunicación entre profesionales. Además, el periodo de seguimiento de 2 años permite observar el verdadero impacto de la herramienta a largo plazo. Como se ha comentado, estos aspectos son diferenciales respecto a otros estudios acerca del impacto de estrategias de disminución de derivaciones.

Por otro lado, y dado que la herramienta se diseñó e implementó con un objetivo asistencial, no se trataba de un proyecto piloto sino que se fue consolidando a lo largo del periodo de investigación, por lo que los resultados analizados al final del periodo de seguimiento corresponden con el uso durante una etapa de madurez de la plataforma, hecho que aumenta la fiabilidad de los resultados.

Por último, cabe destacar que con esta tesis se ofrece una visión global de la utilidad y funcionamiento de la plataforma, a partir de un enfoque mixto cuantitativo-cualitativo. Esta metodología permite complementar entre sí los hallazgos obtenidos, de forma que aquellos aspectos que no podían ser explicados con datos numéricos, como la percepción de utilidad, grado de satisfacción o mejora de comunicación eran detectados mediante el análisis cualitativo de las entrevistas. Incluso en una variable numérica como es el número de derivaciones, aportar la visión subjetiva de los propios usuarios a partir de su propia experiencia, permite añadir una información muy valiosa a la hora de interpretar los resultados.

8.7. Limitaciones de la investigación

A lo largo del desarrollo de esta tesis doctoral se han detectado diversas limitaciones.

En primer lugar, se debe tener en cuenta que, a pesar de que la muestra de estudio fueron todos los médicos de AP de una determinada área, el número de derivaciones por cada médico y especialidad era sensiblemente bajo, hecho que limitaba la potencia estadística de la pruebas practicadas.

En segundo lugar, se debe tener en cuenta que el número de profesionales de AP que hizo un uso intenso de la plataforma es limitado, cosa que también ha reducido la posibilidad de detectar diferencias significativas entre los grupos. Según los datos obtenidos, creemos que un mayor uso de la plataforma permitiría obtener resultados aún más favorables.

Y en tercer lugar, se deberían establecer mecanismos para evaluar el impacto de otros aspectos que a la vez pueden influir en el número de derivaciones y que no han sido tenidos en cuenta en estos trabajos, como podrían ser la realización de cursos de formación a nivel individual, acceso más directo a especialistas en el propio centro en comparación con el resto de centros de trabajo, realizar formación pre o postgrado en el CAP o estar acreditado como tutor de residente.

9. Conclusiones

- El uso de la CoPC ECOPIH para consultar casos clínicos entre AP y AE permite reducir el número de derivaciones en las especialidades de Cardiología, Endocrinología y Gastroenterología.
- Los factores que determinan el uso de ECOPIH entre los profesionales de AP son, por un lado, la percepción de utilidad para la reducción de costes y para mejorar la calidad de la práctica clínica; y por otro, el uso habitual de las redes sociales por parte de los profesionales (aplicaciones y páginas web).
- El grado de fidelización en el uso de la plataforma es elevado por parte de los médicos, sobre todo entre las mujeres por debajo de los 50 años.
- Los profesionales sanitarios creen que la plataforma ECOPIH es útil, eficaz, rápida y eficiente, y permite reducir el número de derivaciones, así como mejorar la comunicación entre niveles asistenciales.
- Las claves para el éxito de una CoPC son disponer de un espacio temporal dentro de su actividad asistencial para destinarlo a su uso y establecer un sistema de reconocimiento de esta actividad, siendo necesario por tanto contar con el apoyo de las instituciones para asegurar su sostenibilidad a largo plazo.

10. Líneas de futuro

Con el objetivo de evaluar la herramienta en todas sus dimensiones, es necesario avanzar en el estudio del impacto de las CoPC en términos económicos (disminución cuantitativa de derivaciones, análisis de costes, disminución de la frecuentación) y clínicos (impacto en determinadas variables clínicas susceptibles de mejorar mediante una mayor comunicación entre profesionales) [130].

Creemos que, a pesar de que se ha evaluado su impacto durante un uso en las máximas condiciones reales, para aumentar la potencia estadística sería conveniente analizar los datos de utilización en un área sanitaria más grande, o fomentando una mayor utilización de la plataforma por parte de los profesionales.

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12. Anexos

12.1. Anexo 1. Estadísticas de uso de la plataforma ECOPIH durante los años 2011 y 2012 para las especialidades evaluadas

Actividad en las seis especialidades activas en ECOPIH (2011 y 2012)							
Especialidad	**Inicio**[1]	**Lect totales**[2]	**Aport totales**[3]	**Núm casos**[4]	**Núm doc**[5]	**Núm imág**[6]	**Núm blog**[7]
Cardiología	enero-11	3099	249	**39**	**19**	**4**	**5**
Digestología	mar-12	3476	342	**68**	**13**	**3**	**4**
Endocrinología	enero-12	2923	230	**38**	**16**	**-**	**5**
Nefrología	noviembre-11	383	35	**9**	**1**	**-**	**-**
Neumología	octubre-10	1247	108	**24**	**5**	**-**	**-**
Neurología	julio-11	1089	95	**16**	**7**	**3**	**5**

- 1 "Inicio": Mes y año en el que el que cada especialidad fue activada y disponible para su consulta.
- 2 "Lect totales": Número de lecturas totales de los contenidos de cada especialidad, es decir, número de veces que los usuarios han leído las aportaciones.
- 3 "Aport totales": Número de aportaciones totales que los usuarios, ya sean profesionales de AP o consultores, han realizado en cada especialidad.
- 4 "Núm casos": Número de casos clínicos consultados.
- 5 "Núm doc": Número de documentos compartidos en cada especialidad, habitualmente para reforzar una respuesta en un caso clínico.
- 6 "Núm imág": Número de imágenes compartidas, la mayor parte de ellas usadas para complementar la información de un caso clínico.
- 7 "Núm blog": Número de entradas del blog, en la que se hacía difusión de diferente tipo de información (cursos, recomendaciones de páginas web interesantes u otro tipo de recursos).

Actividad según la herramienta utilizada, en las seis especialidades activas en ECOPIH (2011 y 2012)

Especialidad	Lect-Casos[1]	Lect-Doc[2]	Lect-Blog[3]	Lect-Imág[4]	Aport-Casos[5]	Aport-Doc[6]	Aport-Blog[7]	Aport-Imág[8]
Cardiología	2412	461	181	45	201	461	11	7
Digestología	3196	80	174	26	309	14	10	3
Endocrinología	2656	79	188	-	205	20	5	-
Nefrología	370	13	-	-	34	1	-	-
Neumología	1102	63	82	-	95	5	8	-
Neurología	937	45	53	54	82	5	6	2

- 1 “Lect-Casos”: Número de veces en que los usuarios han leído los casos clínicos.
- 2 “Lect-Doc”: Número de ocasiones en que se han consultado los documentos.
- 3 “Lect-Blog”: Número de veces en que se han leído las entradas del blog.
- 4 “Lect-Imág”: Número de veces en que se han visualizado las imágenes.
- 5 “Aport-Casos”: Número de veces en que se ha realizado alguna aportación en los casos clínicos, ya sea como consulta del caso o para ofrecer alguna respuesta o comentario.
- 6 “Aport-Doc”: Número de veces en que se han compartido documentos.
- 7 “Aport-Blog”: Número de veces en que se han realizado aportaciones en el apartado del blog.
- 8 “Aport-Imág”: Número de imágenes compartidas.

12.2. Anexo 2. Estadísticas de uso de la plataforma ECOPIH desde su inicio hasta la actualidad

A título informativo, y para conocer más en profundidad el alcance de la plataforma ECOPIH más allá de los resultados de la investigación, a continuación se detallan los datos relativos a la intensidad de uso de cada una de las especialidades disponibles en la plataforma ECOPIH, desde su inicio en el año 2010 hasta la actualidad. Se han resaltado las especialidades que han sido evaluadas en este estudio.

Actividad global en las diferentes especialidades activas en ECOPIH							
Especialidad	**Inicio[1]**	**Lect totales[2]**	**Aport totales[3]**	**Núm casos[4]**	**Núm doc[5]**	**Núm imág[6]**	**Núm blog[7]**
Alergología	sept-11	473	27	10	1	-	-
Cardiología	**enero-11**	**4376**	**336**	**64**	**26**	**-**	**5**
Consejo genético	sept-12	211	21	5	2	-	-
Cuidados paliativos	octubre-10	639	30	5	2	-	2
Digestología	**mar-12**	**7158**	**625**	**151**	**22**	**3**	**6**
Endocrinología	**enero-12**	**5267**	**424**	**87**	**27**	**-**	**5**
Ética asistencial	abril-11	1238	72	9	8	-	1
Farmacología	octubre-10	2515	260	39	64	-	5
Geriatría	abril-11	948	72	11	4	-	2
Hematología	sept-12	1511	161	49	2	-	1
Infecciosas	agosto-12	431	38	13		-	4
Laboratorio	octubre-10	1757	143	27	11	-	5
Medicina tropical	octubre-10	1509	171	34	9	-	-
Miscelánea	marzo-11	4002	172	48	3	5	4
Úlceras crónicas	agosto-11	2691	181	17	29	11	5
Nefrología	**noviembre-11**	**1167**	**107**	**31**	**3**	**-**	**2**
Neumología	**octubre-10**	**2041**	**169**	**36**	**9**	**3**	**5**
Neurología	**julio-11**	**2452**	**200**	**49**	**15**	**-**	**3**
Odontología	nov-10	145	10	2	2	-	-
Oncología	enero-13	157	21	5	-	-	-
Pediatría	diciembre-10	755	93	18	19	1	5
Podología	octubre-10	482	53	9	2	4	1

Radiología	febrero-11	1039	90	14	2	12	4
Rehabilitación	nov-10	539	45	10	1	-	2
Salud Laboral	octubre-10	1002	108	19	19	-	5
Salud Mental	julio-11	920	70	11	4	-	
Tabaquismo	octubre-10	780	56	7	8	-	5
Trabajo Social	octubre-10	181	29	6	5	-	2
Urología	julio-11	1705	134	28	3	-	5
Vacunas	octubre-10	3128	204	48	11	3	-
Vascular	octubre-10	872	113	10	6	9	5
TOTAL		**52091**	**4235**	**872**	**319**	**51**	**89**

- 1 “Inicio”: Mes y año en el que el que cada especialidad fue activada y disponible para su consulta.
- 2 “Lect totales”: Número de lecturas totales de los contenidos de cada especialidad, es decir, número de veces que los usuarios han leído las aportaciones.
- 3 “Aport totales”: Número de aportaciones totales que los usuarios, ya sean profesionales de AP o consultores, han realizado en cada especialidad.
- 4 “Núm casos”: Número de casos clínicos consultados.
- 5 “Núm doc”: Número de documentos compartidos en cada especialidad, habitualmente para reforzar una respuesta en un caso clínico.
- 6 “Núm imág”: Número de imágenes compartidas, la mayor parte de ellas usadas para complementar la información de un caso clínico.
- 7 “Núm blog”: Número de entradas del blog, en la que se hacía difusión de diferente tipo de información (cursos, recomendaciones de páginas web interesantes u otro tipo de recursos).

Actividad según la herramienta utilizada, para cada especialidad activa en ECOPIH								
Especialidad	**Lect-Casos[1]**	**Lect-Doc[2]**	**Lect-Blog[3]**	**Lect-Imág[4]**	**Aport-Casos[5]**	**Aport-Doc[6]**	**Aport-Blog[7]**	**Aport-Imág[8]**
Alergología	456	17	-	-	26	1	-	-
Cardiología	**3458**	**688**	**185**	**45**	**280**	**38**	**11**	**7**
Consejo genético	177	34	-	-	19	2	-	-
Cuidados paliativos	422	130	87	-	20	5	5	-
Digestología	**6465**	**592**	**86**	**15**	**587**	**29**	**7**	**2**
Endocrinología	**4756**	**254**	**257**	**-**	**385**	**29**	**10**	**-**
Ética asistencial	968	256	14	-	63	8	1	-
Farmacología	1746	412	357	-	157	68	35	-
Geriatría	810	71	67	-	66	3	3	-
Hematología	1416	91	4	-	157	3	1	-
Infecciosas	395	-	36	-	34		4	-
Laboratorio	1361	169	164	-	122	7	12	-
Medicina tropical	1416	156	-	-	93	15	-	-
Miscelánea	3371	362	172	102	153	11	3	5
Úlceras crónicas	1335	544	507	305	115	29	27	10
Nefrología	**1075**	**70**	**22**	**-**	**102**	**3**	**2**	**-**
Neumología	**1814**	**118**	**53**	**56**	**151**	**10**	**6**	**2**
Neurología	**2039**	**266**	**147**	**-**	**174**	**15**	**11**	
Odontología	128	8	-	-	17	2	-	-
Oncología	157	-	-	-	21	-	-	-
Pediatría	428	162	153	12	60	13	19	1
Podología	393	75	10	4	46	3	2	2
Radiología	624	316	56	43	69	11	6	4
Rehabilitación	467	47	25	-	40	4	1	-
Salud Laboral	766	149	87	-	79	10	19	-
Salud Mental	879	41	-	-	66	4	-	-
Tabaquismo	472	180	128	-	31	17	8	-
Trabajo Social	112	55	14	-	23	4	2	-
Urología	1567	82	56	-	123	8	3	-
Vacunas	2887	167	74		183	14	7	
Vascular	508	233	112	19	89	3	14	7
TOTAL	**42868**	**5745**	**2873**	**601**	**3551**	**369**	**219**	**40**

- 1 “Lect-Casos”: Número de veces en que los usuarios han leído los casos clínicos.
- 2 “Lect-Doc”: Número de ocasiones en que se han consultado los documentos.
- 3 “Lect-Blog”: Número de veces en que se han leído las entradas del blog.
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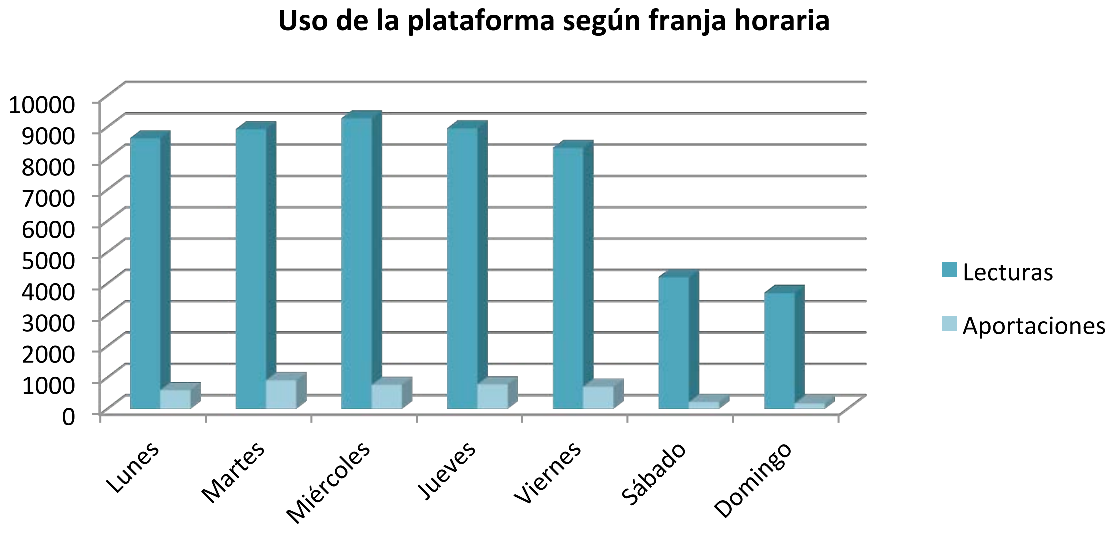
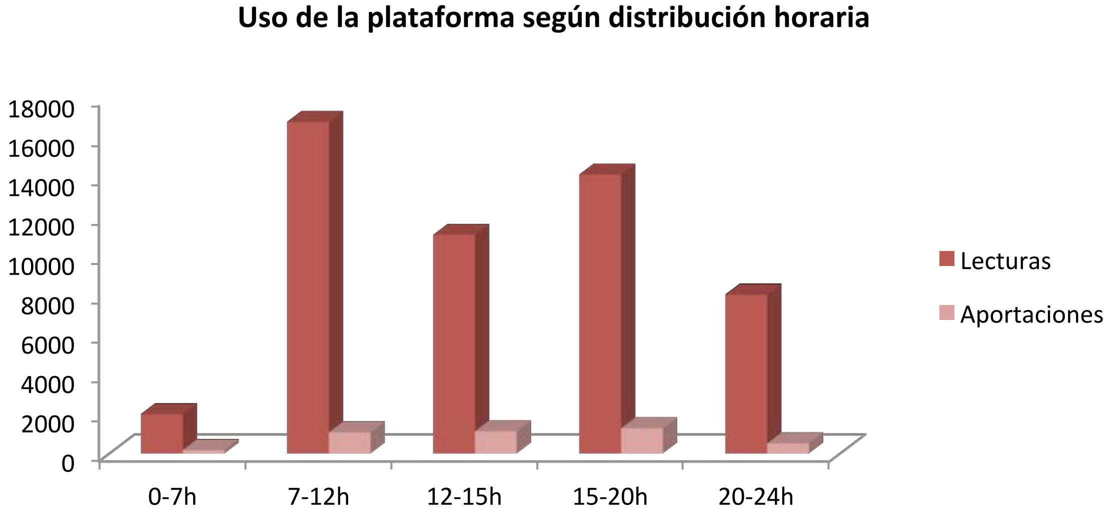
- 6 “Aport-Doc”: Número de veces en que se han compartido documentos.
- 7 “Aport-Blog”: Número de veces en que se han realizado aportaciones en el apartado del blog.
- 8 “Aport-Imág”: Número de imágenes compartidas.

A continuación se ofrecen dos gráficos. En el primero de ellos se muestran los datos de utilización de la plataforma en función del día de la semana. En este caso, destaca que la actividad se mantiene estable en los días laborables (de lunes a viernes), con cierta disminución al principio y al final de la semana. Durante el fin de semana, es de resaltar que la actividad es significativa, siendo hasta mitad de la que hay en un día laborable. Este hecho puede reflejar el interés y la implicación de sus usuarios, los cuales hacen uso de la plataforma de una forma destacable incluso en sus días festivos.



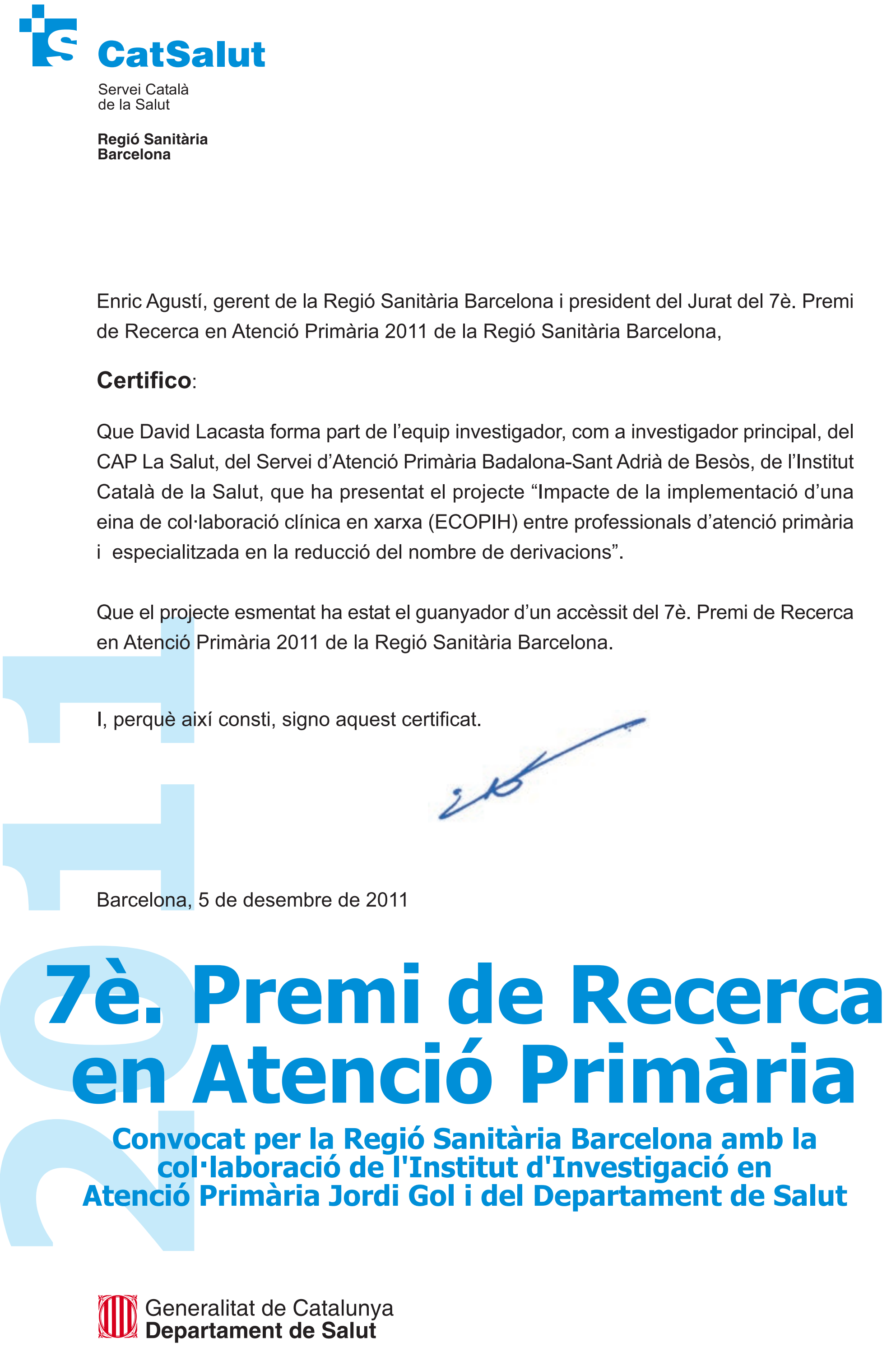
En el segundo gráfico se refleja la utilización de ECOPIH en función de la franja horaria a lo largo del día. Como era de esperar, el mayor uso se produce durante las horas de la jornada laboral, pero también se usa de una forma destacable durante la tarde (15-20h) y también la noche (20-24h), horarios en los que probablemente el usuario está fuera del trabajo. Una vez más, este análisis muestra el interés de la herramienta por parte de sus usuarios, dispuestos a utilizarla desde sus domicilios o en horas de descanso.



12.3. Anexo 3. Premios y becas concedidos

El proyecto de investigación que da como resultado esta tesis doctoral ha sido galardonado en dos ocasiones (años 2011 y 2016). En el primer caso se concedió un importante premio económico que ha permitido cubrir lo gastos de traducción y publicación. El segundo premio consistió en una liberación del 25 por ciento de la jornada laboral para dedicar al estudio, durante un período de 2 años. A continuación se adjuntan los dos certificados.

Accésit del 7º Premio de Investigación en Atención Primaria 2011 de la Región Sanitaria de Barcelona



CatSalut
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Barcelona

Enric Agustí, gerent de la Regió Sanitària Barcelona i president del Jurat del 7è. Premi de Recerca en Atenció Primària 2011 de la Regió Sanitària Barcelona,

Certifico:

Que David Lacasta forma part de l'equip investigador, com a investigador principal, del CAP La Salut, del Servei d'Atenció Primària Badalona-Sant Adrià de Besòs, de l'Institut Català de la Salut, que ha presentat el projecte "Impacte de la implementació d'una eina de col·laboració clínica en xarxa (ECOPIH) entre professionals d'atenció primària i especialitzada en la reducció del nombre de derivacions".

Que el projecte esmentat ha estat el guanyador d'un accèssit del 7è. Premi de Recerca en Atenció Primària 2011 de la Regió Sanitària Barcelona.

I, perquè així consti, signo aquest certificat.

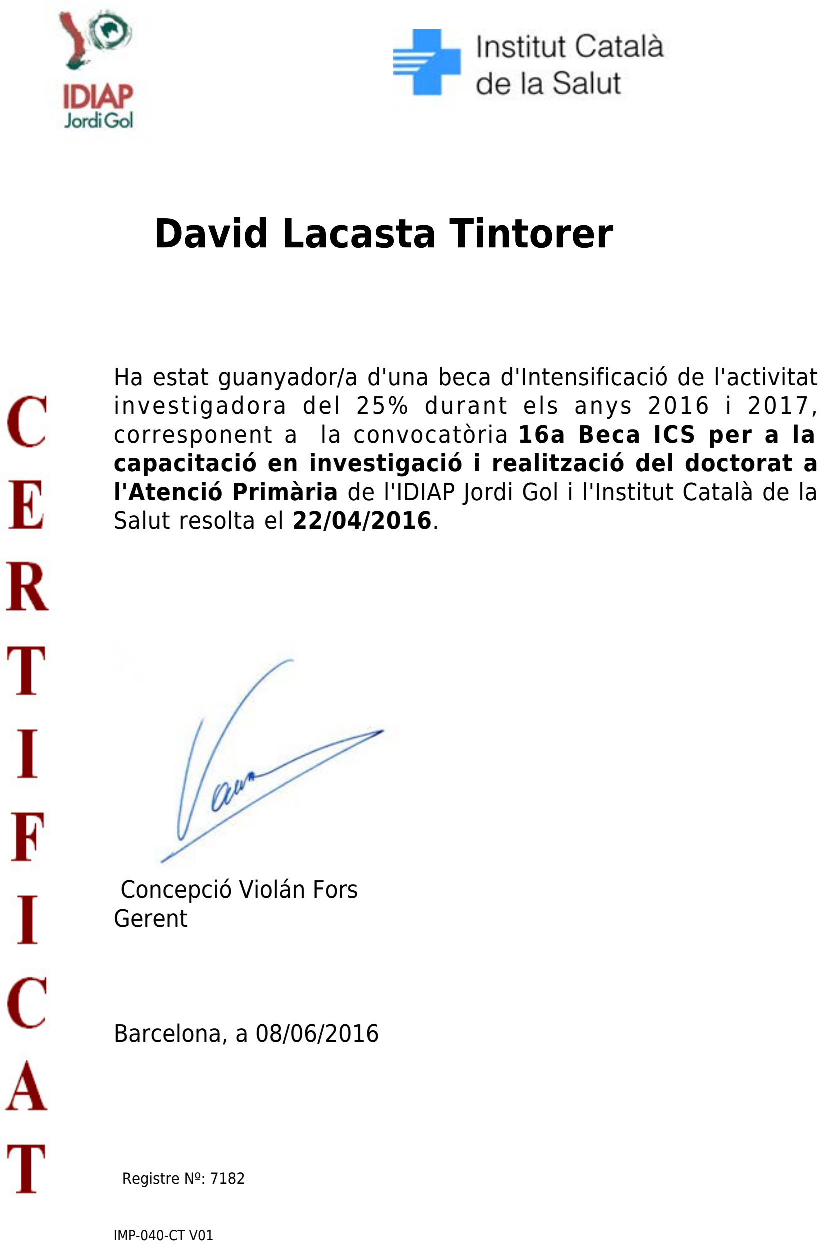
Barcelona, 5 de desembre de 2011

7è. Premi de Recerca
en Atenció Primària

Convocat per la Regió Sanitària Barcelona amb la
col·laboració de l'Institut d'Investigació en
Atenció Primària Jordi Gol i del Departament de Salut

Generalitat de Catalunya
Departament de Salut

16ª Beca ICS para la capacitación en investigación y realización del doctorado en Atención Primaria (2016)



IDIAP Jordi Gol

Institut Català de la Salut

David Lacasta Tintorer

CERTIFICAT

Ha estat guanyador/a d'una beca d'Intensificació de l'activitat investigadora del 25% durant els anys 2016 i 2017, corresponent a la convocatòria **16a Beca ICS per a la capacitació en investigació i realització del doctorat a l'Atenció Primària** de l'IDIAP Jordi Gol i l'Institut Català de la Salut resolta el **22/04/2016**.

Concepció Violán Fors
Gerent

Barcelona, a 08/06/2016

Registre Nº: 7182

IMP-040-CT V01

12.4. Anexo 4. Entidades que han colaborado en la elaboración de la tesis

Esta tesis doctoral ha sido fruto de un acuerdo de colaboración científica entre la Universitat Oberta de Catalunya (UOC) y la Unitat de Suport a la Recerca Metropolitana Nord (IDIAP Jordi Gol), firmado con fecha 8 de noviembre de 2018, y por el cual se establecen las bases sobre las que se sustentarán los trabajos que se realizan de forma conjunta entre las dos instituciones.

Para la realización de esta tesis también se ha recibido ayuda económica de la Cátedra de Medicina de Familia UAB-Novartis.