Suomen Telelääketieteen ja eHealth seura
Finnish Society of Telemedicine and eHealth

eHealth2023 International Conference

The 28th Finnish National Conference on Telemedicine and eHealth

“Human oriented approach in eHealth and digital services”

12.-13.10.2023

Tikkurila, Vantaa

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Editors: Laura Tahvanainen, Pirkko Kouri, Outi Ahonen, Jarmo Reponen

Esipuhe
XXVIII Kansallinen, että kansainvälinen Telelääketieteen ja eHealth konferenssi

Outi Ahonen, puheenjohtaja
Suomen telelääketieteen ja eHealth seura ry

Arvoisat kutsuvieraat, hyvät konferenssipäiviin osallistujat, sekä paikan päällä että etänä.

Suomen telelääketieteen ja eHealth seuran puolesta minulla on ilo toivottaa teidät tervetulleeksi eHealth2023 konferenssiin ja samalla 28. vuotuiseen kansalliseen konferenssiimme Vantaalle, jonka teemana on ”Human oriented approach in eHealth and digital services”.

Seura on jo vuodesta 1995 edistänyt tieto- ja viestintätekniikan käyttöä terveydenhuollossa. Seuramme tärkein toimintamuoto on koulutustilaisuuksien järjestäminen ja kansalliseen keskusteluun osallistuminen. Seuramme julkaisee nyt yhdettätoista virallista vuosikertaa Finnish Journal of eHealth and eWelfare (FinJeHeW) -lehdestä yhdessä Sosiaali- ja terveydenhuollon tietojen käsittely-yhdistyksen (STTY) kanssa. Vuodesta 2004 alkaen olemme jakaneet vuosittaisen kansallisen eHealth- tunnustuspalkinnon ansiokkaasta toiminnasta telelääketieteen ja eHealthin alueella, joksi katsotaan esimerkiksi telelääketieteen ja/tai eHealth alaan kuuluva väitöskirja tai muu merkittävä seuran tavoitteiden mukainen toiminta kansallisella ja kansainvälisellä tasolla.

Tuemme myös ammatillista jatkokoulutusta eHealth -sektorilla vastaamalla osaltamme lääkäreiden, hammaslääkäreiden ja eläinlääkäreiden terveydenhuollon tietotekniikan erityispätevyysohjelmasta yhdessä Suomen lääkäriliiton ja Suomen hammaslääkäriliiton ja Suomen eläinlääkäriliiton kanssa. Konferenssista myönnetään 10 tuntia teoreettista koulutusta lääkäreiden, hammaslääkäreiden ja eläinlääkäreiden terveydenhuollon tietotekniikan erityispätevyyteen.

Seuramme tukee stipendein suomalaisen eHealth osaamisen näkymistä kansainvälisesti. Seuramme on perustajajäsen pohjoismaisessa Nordic Telehealth Association (NTA) järjestössä sekä toiseksi vanhin jäsen International Society for Telemedicine and eHealth (ISfTeH) järjestössä. Seuramme sihteeri Pirkko Kouri työskentelee ISfTeH:n johtoryhmän varapuheenjohtajana.

Vuoden 2023 konferenssissa käsitellään teemoja ja tuodaan uusinta tietoa kansainvälisestä ja kansallisesta digitaalisen sosiaali- ja terveydenhuollon kehityksestä ja ratkaisuista. Kohtauspaikkana konferenssi tarjoaa tuoretta tietoa niin eri alojen lääkäreille, hoitotyön ja kuntoutuksen eri ammattiryhmille, sosiaalialan toimijoille sekä sosiaali- ja terveydenhuollon digitaalisten palveluiden kehittämisestä kiinnostuneille ammattiryhmille. Koulutus tuo uutta tietoa myös sosiaali- ja terveydenhuollon hallinnosta, suunnittelusta ja koulutuksesta vastaaville toimijoille. Konferenssin työpajat tarjoavat mahdollisuuden keskustella teknologisten ratkaisujen kehittämisestä livinglab ja testbed ympäristöissä. Konferenssimme sisältää englanninkielisen ja suomenkielisen rinnakkaisohjelman. Tilaisuutemme järjestää tutkijoille ja kehittäjille mahdollisuuden esittää tiivistetysti tuloksiaan.

Suomen telelääketieteen ja eHealth seuran puolesta haluan kiittää kaikkia luennoitsijoitamme korkeatasoista esityksistä. Samoin kiitän kaikkia näytteilleasettajiamme ja työpajojen järjestäjiä. Ilman teidän osallistumistanne konferenssimme ei olisi se oppimisen ja verkostoitumisen paikka, jona se nyt palvelee.

Erityinen kiitos konferenssistamme kuuluu pääyhteistyökumppanillemme Laurea-ammattikorkeakoululle, joka on vastannut viestinnästä, käytännön järjestelyistä.

Toivon kaikille osanottajille antoisaa konferenssia.

Outi Ahonen

Foreword
The 28th Finnish National, and International Conference on Telemedicine and eHealth

Outi Ahonen, President
Finnish Society of Telemedicine and eHealth, Finland

Distinguished invited guests, dear participants of the conference, both on site and remotely.

It is my great pleasure to warmly welcome all of you to our eHealth2023 and 28th annual conference to Vantaa, the theme of which is" Human oriented approach in eHealth and digital services".

Finnish Society of Telemedicine and eHealth (FSTeH) has been promoting the use of information and communication technology in health care since 1995. Our most important activity is to arrange educational events and to participate in the national discussion. Our society also publishes the Journal of eHealth and eWelfare (FinJeHew) together with the Finnish Social and Health Informatics Association (FinnSHIA). Since 2004, we have delivered the annual Finnish eHealth award for the significant accomplishments in the field of telemedicine and eHealth. The required activity can be for example a doctoral thesis in this area or some other important activity in the national or international level supporting the society´s goals.

We are supporting further education and training of health professional in the eHealth sector by coordinating the special competence program for healthcare information technology for physicians, dentists and vetenerians together with the Finnish Medical Association, the Finnish Dental Association and the Finnish Veterinary Association. Our conference will contribute 10 hours of theoretical training for Finnish physicians´, dentists´ and veterinarians´ special competence for healthcare information technology.

Our society supports the international visibility of Finnish eHealth expertise by scholarships. Our society is a founding member of Nordic Telehealth Association (NTA) and International Society for Telemedicine and eHealth (ISfTeH). Our society´s secretary Pirkko Kouri holds one of the ISfTeH´s board member seats as ISfTeH´s vice-president.

This year´s conference covers themes from updating the knowledge about international and national digital health trends and solutions. The conference offers a unique meeting place providing new information to physicians from different fields, different professional groups in nursing, rehabilitation and social welfare as well as other professional groups who are interested in the development of digital healthcare and welfare services. The conference also brings new knowledge to those responsible for the administration, planning and training of health and social care in people´s daily lives. Our conference includes parallel programs in English and Finnish as well as joint plenaries. Our conference organizes sessions and exhibitions for researchers and developers where they can present their research, innovation and development (RDI) results in a compact format.

On behalf of Finnish Society of Telemedicine and eHealth I would like to express my gratitude to all lecturers and scientific abstract presenters for their valuable contributions. Our sincere thanks belong also to all our exhibitors and demonstrators. Without your support, this conference could not be the networking event it is today.

Our special thanks belong to our fellow organizer, Laurea University of Applied Siences. They have been responsible for communication, practical arrangements and also took part in the scientific committee.

I wish everybody a very successful conference.

Outi Ahonen

eHealth 2023 järjestelytoimikunnan puheenjohtajan tervehdys

Mari Vuolteenaho, järjestelytoimikunnan puheenjohtaja
Laurea-ammattikorkeakoulu

Hyvät konferenssin osallistujat,

Olemme iloisia saadessamme toivottaa teidät kaikki konferenssivieraat tervetulleeksi Laurea – ammattikorkeakouluun kuulemaan uusia tuulia digitaalisen sosiaali- ja terveydenhuollon tutkimisen ja kehittämisen alueelta.

Laurealla on nyt toisen kerran mahdollisuus olla mukana järjestämässä kansallista ja kansainvälistä eHealth konferenssia. Edellinen konferenssi järjestettiin Espoon kampuksella 2015. Nyt olemme Vantaa-Tikkurilan kampuksella. Sosiaali- ja terveydenhuollon sähköisten palveluiden kehittämisessä on tapahtunut paljon asioita kuluneena kahdeksana vuonna. Suomalainen sosiaali- ja terveydenhuolto on ollut suuren paineen alla jo pitkään, jota COVID-19-pandemia lisäsi. Yhä kiristyvässä yhteiskunnan taloustilanteessa ja palvelutarpeiden kasvaessa sosiaali- ja terveydenhuollon toimiville digitaalisille ja teknologisille ratkaisuille on yhä suurempi tarve. Vuosittaiset eHealth konferenssit ovat suoraa toimintaa yhteiskunnallisen vaikuttavuuden eteen. Konferenssi on yksi kanava julkaista sosiaali- ja terveydenhuollon tutkimus- ja kehittämistyön tuloksia. Kuulemme kutsuttuja asiantuntijaluennoitsijoita ja tieteellisiä esityksiä tutkijoiden ja kehittäjien esitellessä ratkaisuja reaalielämän ongelmiin tutkimuksen ja kehittämistyön tulosten kautta. Konferenssi mahdollistaa laajasti ammattilaisten osaamisen vahvistamisen niin sosiaali- ja terveydenhuollossa kuin korkeakoulumaailmassakin. Ammattikorkeakoululle on myös erittäin merkityksellistä, että opiskelijat saavat mahdollisuuden osallistua konferenssin tuottamisprosessiin ja näkevät kokonaisuuden, mitä kaikkea tieteellisen konferenssin järjestämiseen kuuluu. Konferenssiyleisön lisäksi konferenssikirja ja konferenssista viestiminen mediassa laajentavat tutkimustulosten leviämistä laajemmallekin yleisölle.

On ollut ilo Laurean puolelta työskennellä erittäin sitoutuneen ja asiantuntevien seuran hallituksen jäsenten kanssa konferenssin järjestelyissä. Yhteistyössä on tullut hyvin ilmi, miten uraauurtavaa työtä seurassa on tehty jo kohta kolmekymmentä vuotta, ja miten se osataan tuoda tämän päivän kontekstiin, kun digitaalisten toimintamallien mahdollisuudet ovat kasvaneet ja käyttäjäkunta niin ammattilaisissa ja kansalaisissa laajenee jatkuvasti hyvinvointialueiden ottaessa palveluita käyttöön laajemmin.

Järjestelytoimikunnassa kahden päivän konferenssi vaatii lähes vuoden työn. Järjestelytoimikunnassa vahvan tiimihengen syntyminen ja innostus asiaan on tärkeä peruskivi työskentelylle. Tarvitaan uskoa siihen, että asiat saadaan järjestymään ratkottaessa esiin tulevia pulmia. Kiitän Suomen telelääketieteen ja eHealth seuran nykyisen hallituksen jäseniä Jarmo Reposta, Pirkko Kouria, Liisa Klemolaa, Vesa Jormanaista, Aleksi Schreytä, Hanna Iisaloa, Paula Veikkolaista, Birgitta Tetriä ja Outi Ahosta, sekä edellisen hallituksen Timo Tuovista ja Jari Nummista arvokkaasta panoksesta konferenssin järjestämisen eteen. Laureassa konferenssin käytännön järjestelyitä on väsymättä vienyt eteenpäin Laura Tahvanainen. Ilman hänen laajaa työpanostaan konferenssi ei olisi ollut mahdollinen. Birgitta Tetri ja Outi Ahonen ovat omalla työpanoksellaan mahdollistaneet konferenssin toteutumisen niin hallituksen jäseninä, kuin laurealaisina. Kiitän Sari Heikkistä, joka on osallistunut konferenssin tieteellisen ohjelman rakentamiseen ja tieteellisen toimikunnan työskentelyyn aktiivisesti seuran hallituksen kanssa. Kiitän Liisa Sillanpäätä ja Sanna Juvosta arjen ongelmien ratkomisesta, sekä Anton Mäkelää arvokkaasta työstä nettisivujen rakentamisessa. Yhtä lailla kiitän kaikkia Laurean henkilöstön jäseniä, jotka ovat osallistuneet yhteiseen työskentelyyn. Tämän konferenssikirjan sivuilta selviää laaja järjestäjäjoukko.

Konferenssimme ohjelma on monipuolinen ja on hienoa saada asiantuntijoita koolle laajasti eri yhteiskunnallisista rooleista, yhteisen kiinnostuksen kohteen digitaalinen terveyden äärelle, joka on yhä laajeneva tieteellinen tutkimusalue. Toivon osallistujille antoisia päiviä innostavan ohjelman ja käytäväkeskustelujen äärellä.

Mari Vuolteenaho

Welcome words from the chairperson of the eHealth2023 organizing committee

Mari Vuolteenaho, Chairperson of the Organizing committee
Laurea University of Applied Sciences

Dear participants of the conference,

We are happy to welcome all of you conference guests to Laurea University of Applied Sciences to hear new winds in the area of research and development of digital social and health care.

For the second time, Laurea has the opportunity to co-organise a national and international eHealth conference. The previous conference was held at the Espoo Campus in 2015. Now we are on the Vantaa-Tikkurila campus. A lot has happened in the development of e-services for social welfare and health care in the past eight years. Finnish social welfare and health care has been under great pressure for a long time, which was increased by the COVID-19 pandemic. With the ever-tightening economic situation of society and growing service needs, there is an increasing need for well-functioning digital and technological solutions in social welfare and health care. The annual eHealth conferences are a direct response to societal impact. The conference is one of the channels for publishing the results of research and development in social welfare and health care. We hear invited expert lecturers and scientific presentations as researchers and developers present solutions to real-life problems through the results of research and development work. The conference will make it possible to strengthen the competence of professionals in social welfare and health care as well as in higher education. It is also very significant for the University of Applied Sciences that students get the opportunity to participate in the process of producing a conference and see the entirety of what is involved in organizing a scientific conference. In addition to the conference audience, the conference book and media coverage of the conference expand the dissemination of research results to a wider audience.

It has been a pleasure for Laurea to work with highly committed and knowledgeable members of the board of the club on the arrangements for the conference. The collaboration has shown how pioneering work has been done in the company for almost thirty years and how it can be brought into today's context as the opportunities for digital operating models have increased and the user base in both professionals and citizens is constantly expanding as well-being service counties are adopting services more widely.

In the organizing committee, the two-day conference requires almost a year of work. In the organizing committee, the emergence of a strong team spirit and enthusiasm for the matter is an important foundation stone for working. It takes faith to make things work out when solving problems that arise. I would like to thank the members of the current board of the Finnish Society of Telemedicine and eHealth, Jarmo Reponen, Pirkko Kouri, Liisa Klemola, Vesa Jormanainen, Aleksi Schrey, Hanna Iisalo, Paula Veikkolainen, Birgitta Tetri and Outi Ahonen, and the previous board, Timo Tuovinen and Jari Numminen, for their valuable contribution to the conference. In Laurea, the practical arrangements of the conference have been carried forward tirelessly by Laura Tahvanainen. Without her extensive work, the conference would not have been possible. Birgitta Tetri and Outi Ahonen have made their contribution to the conference possible both as members of the Board of Directors and as Laurea’s staff. I would like to thank Sari Heikkinen, who has been actively involved in the construction of the scientific programme of the conference and the work of the Scientific Commission with the board of the Society. I thank Liisa Sillanpää and Sanna Juvonen for solving everyday problems, and Anton Mäkelä for his valuable work in building the website. I would equally like to thank all of Laurea's staff members who have participated in the joint work. A large group of organizers can be found on the pages of this conference book.

Our conference program is diverse, and it is great to have experts from a wide range of social roles, with a common interest in digital health, which is an ever-expanding area of scientific research. I wish the participants a rewarding day with an inspiring programme and corridor discussions.

Mari Vuolteenaho

Järjestäjät / Organizers

Suomen telelääketieteen ja eHealth seura ry

Suomen Telelääketieteen ja eHealth seura on tieteellinen seura, jonka tarkoituksena on informaatio- ja kommunikaatioteknologian kautta edistää väestön terveyttä ja terveydenhuollollisen asiantuntemuksen levittämistä. Tarkoituksensa toteuttamiseksi seura järjestää seminaareja, luento- ja esitelmätilaisuuksia, kursseja ja symposiumeja, kehittää toimivan sähköisen yhteydenpitojärjestelmän jäsenten välillä, harjoittaa julkaisutoimintaa, tukee alan tutkimustyötä, antaa lausuntoja telelääketieteen kysymyksissä sekä ylläpitää suhteita ulkomaisiin alan järjestöihin. Suomen Telelääketieteen ja eHealth seura on jäsenenä alan kansainvälisissä verkostoissa kuten International Society for Telemedicine and eHealth, Nordic Telemedicine Association, IHE International ja European Connected Health Alliance.

Seuran jäseneksi voi hallitus hakemuksesta hyväksyä henkilöjäseniä sekä kannatus- ja yhteisöjäseniä, jotka toiminnallaan edistävät seuran tarkoitusta. Jäsenetuihin kuuluvat jäsenkirjeet, joissa tiedotetaan ajankohtaisista telelääketieteen koulutustapahtumista sekä hallituksen toiminnasta. Seuran jäsenille myönnetään alennus osanottomaksuista seuran järjestämiin tilaisuuksiin. Jäsenenä voi hakea myös matka-apurahoja. Liittymällä jäseneksi Sinulle avautuu verkosto, jossa saat helposti kontaktin muihin asiasta kiinnostuneisiin henkilöihin.

Seura jakaa vuosittain eHealth -tunnustuspalkinnon alan ansioituneelle henkilölle.

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Finnish Society of Telemedicine and eHealth

Finnish Society of Telemedicine and eHealth is an important forerunner in the field of telemedicine and eHealth in Finland as well as internationally. The aims of the Finnish Society of Telemedicine and eHealth are to promote the health of the population through telecommunication and to disperse the expert knowledge within health care. To reach the aims, the Society will arrange seminars, lectures and presentations, courses and symposia, develop a functioning electronic communication system between the members, exert publishing activities, supports research within the discipline, formulate statements in issues dealing with telemedicine and have contact with other telemedicine organisations.

We have a close collaboration with other national and international organisations, health care service providers and users. The purpose of the society is to promote education and development in the field of telemedicine and eHealth. Finnish Society of Telemedicine and eHealth is member of international networks such as International Society for Telemedicine and eHealth, Nordic Telemedicine Association, IHE International and European Connected Health Alliance.

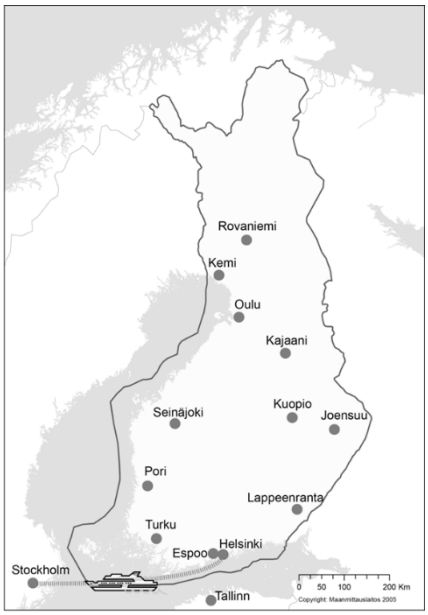
The board accepts the members based on application. Membership will be available for individuals or companies and organisations, as well as supporting membership. Foreign and overseas members do not pay an annual fee, if they submit a regular report of the progress of eHealth in their respective countries.

Each year, the FSTeH delivers the Finnish National eHealth Award to a distinguished person in the field.

Internet: www.telemedicine.fi, Facebook: www.facebook.com/ehealthfinland, Twitter: www.twitter.com/FSfTeHP

The main activity of the FSTeH is annually since 1995 organized the Finnish National Conference on Telemedicine and eHealth. The conference rotates between different cities and telemedicine sites to give local organizers the opportunity to promote their achievements.

- 2020 – Online (National)
- 2015 – Espoo
- 2014 – Tallinn, Estonia (International)
- 2011 – Joensuu
- 2006 – Helsinki, Nordic Congress of eHealth and Telemedicine, NCeHT (International)
- 2005 – Lappeenranta
- 2004 – Kemi
- 2002, 2013 – Seinäjoki
- 2001 – Rovaniemi
- 1999 – Kajaani
- 1998 – Pori
- 1997, 2009, 2021 – Oulu
- 1996, 2007, 2019 – Kuopio (International)
- 1995, 2000, 2017 – Turku
- 2003, 2006, 2008, 2010, 2012, 2016, 2018, 2022 – Cruising Helsinki-Stockholm (International)



Laurea ammattikorkeakoulu

Laurea-ammattikorkeakoulu toimii Uudellamaalla kuudella kampuksella. Laureassa tehdään käytännönläheistä tutkimus- ja kehitystyötä strategisilla tutkimusalueilla, jotka perustuvat tulevaisuuden tarpeisiin ja vahvaan osaamiseen sosiaali- ja terveysalalla, palveluliiketoiminnassa sekä turvallisuudessa. Laurean vuoden 2022 ulkopuolinen T&K-rahoitus oli 7,3 miljoonaa euroa.

Laurean TKI-työ

Soveltavalla tutkimus, kehittämis- ja innovointi (TKI) -työllä Laurea luo uutta tutkittua tietoa ja toimintatapoja, jotka tukevat kestävän kehityksen tavoitteiden saavuttamista. TKI-toiminnassa tavoitteena on, että tutkimusohjelmilla ja läpileikkaavilla teemoilla olisi Laurean osaamisalueiden mukaiset kestävän kehityksen linjaukset ja tavoitteet, joiden perusteella hankeportfoliota arvioidaan.

Laurean TKI-työn keskiössä ovat kansalaiset ja yhteiskunnalliset ilmiöt. Monialaisen lähestymistavan avulla yhdistämme eri tieteenaloja ja toimintatapoja ja teemme yhteiskehittämisen keinoin nopeita kokeiluja ratkaisujen löytämiseksi sekä kilpailuetujen luomiseksi ja edistämiseksi. Kehitämme parempia palveluja, jotka perustuvat tulevaisuuden tarpeisiin ja vahvaan osaamiseen sosiaali- ja terveysalalla, palveluliiketoiminnassa ja kiertotaloudessa sekä turvallisuusalalla yhteistyössä Uudenmaan muiden toimijoiden, kuten yritysten, kaupunkien ja kolmannen sektorin kanssa.

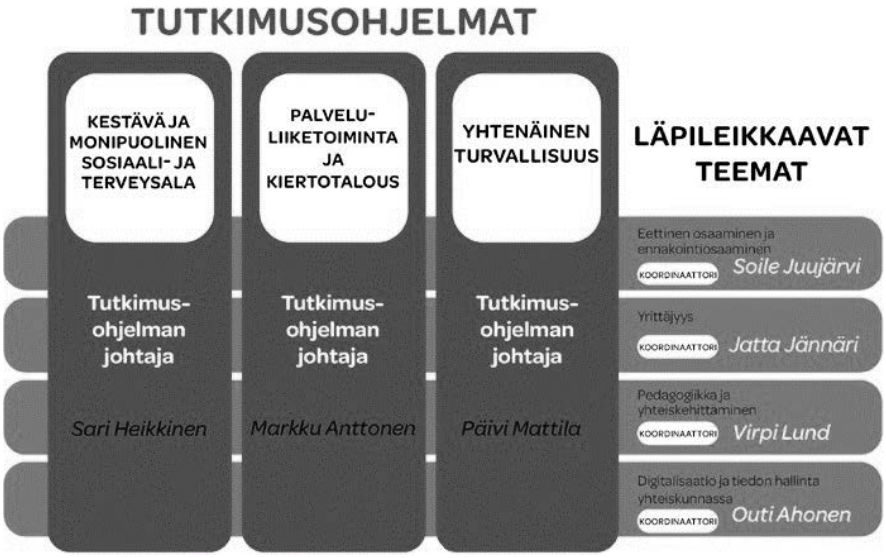
Laurean tutkimusohjelmat

Laurean tutkimusohjelmat kestävä ja monipuolinen sosiaali- ja terveysala, palveluliiketoiminta ja kiertotalous sekä yhtenäinen turvallisuus ovat myös Laurean koulutusohjelmien keskiössä.

Tutkimusohjelma *kestävä ja monipuolinen sosiaali- ja terveysala* vastaa terveyden, hyvinvoinnin ja toimintakyvyn kehittämis- ja tutkimustoiminnasta, vahvistaen osallisuutta yhteiskunnassa ja huomioiden eettisiä näkökohtia, moniammatillista yhteistyötä, kestävää kehitystä ja tulevaisuuden tarpeita SOTE-palveluissa.

Tutkimusohjelma *palveluliiketoiminta ja kiertotalous* tarjoaa alustan esimerkiksi kiertotalouden mukaisten liiketoimintaekosysteemien, palveluinnovaatioiden ja kestävää kehitystä edistävien ratkaisujen tutkimukseen, yhteiskehittämiseen ja toteuttamiseen.

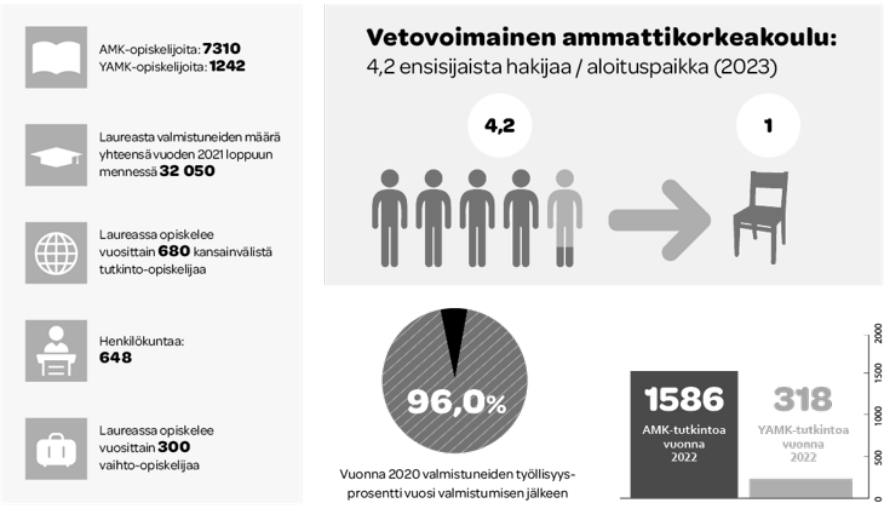
Tutkimusohjelman *yhtenäinen turvallisuus* keskiössä ovat kansainvälistyvän ja digitalisoituvan yhteiskuntamme turvallisuus, ennakointi ja jatkuvuuden varmistaminen, strateginen johtaminen ja turvallisuuden johtaminen.



Kansallinen korkeakoulutuksen Excellence-laatuleima

Kansallinen koulutuksen arviointikeskus (Karvi) myönsi Laurealle korkeakoulutuksen Excellence-laatuleiman keväällä 2023 laadukkaan kehittämistyön ja vuorovaikutteisen TKI-toiminnan johdosta. Laurea on osoittanut innovatiivista edelläkävijyyttä, pitkäjänteistä kehittämisotetta ja osallistavaa toimintakulttuuria. Arviointipaneeli piti Laurean näyttöjä yhteiskunnallisesta vuorovaikutuksesta ja TKI-toiminnasta vahvoina. Laurean TKI-toiminta on tiivis osa Laurean kokonaisstrategian toteuttamista ja Laurea vahvistaa suunnitelmallisesti koko henkilöstön TKI-osaamista arvioiden samalla jatkuvasti toimintansa vaikuttavuutta. Laurea on Suomen johtava ammattikorkeakoulu EU:n horisonttirahoituksen saajana. Laurean TKI-toiminta on myös kytketty pitkäjänteisesti kehitettyyn ja vaikuttavaan Learning by Developing (LbD) -toimintamalliin.

Laurea lukuina



Laurean avainkumppanuudet

Laurea on vuodesta 2019 solminut avainkumppanuuksia, joiden avulla opiskelijoiden työnantajaverkostot vahvistuvat ja laadullinen työllistyminen paranee. Kumppaniverkostoa ylläpidetään tavoitteellisesti, ja aktivoidaan systemaattisesti Laurean tutkimus- ja kehittämistoiminnan sekä liiketoiminnan vahvistamiseksi. Vuoden 2022 lopussa Laurealla oli 84 avainkumppania. https://www.laurea.fi/avainkumppanuus/

Laurea University of Applied Sciences

Laurea University of Applied Sciences operates on six campuses in Helsinki-Uusimaa region. Laurea conducts hands-on research and development in strategic research areas based on future needs and strong expertise in social and health care, service business and security. Laurea's R&D outside funding in 2022 was 7.3 million euros.

Through applied research, development and innovation (RDI) work, Laurea creates new research knowledge and practices that support the achievement of the Sustainable Development Goals. In RDI activities, the goal is for the research programmes and cross-cutting themes to have sustainable development policies and objectives in line with Laurea's areas of expertise, based on which the project portfolio is evaluated.

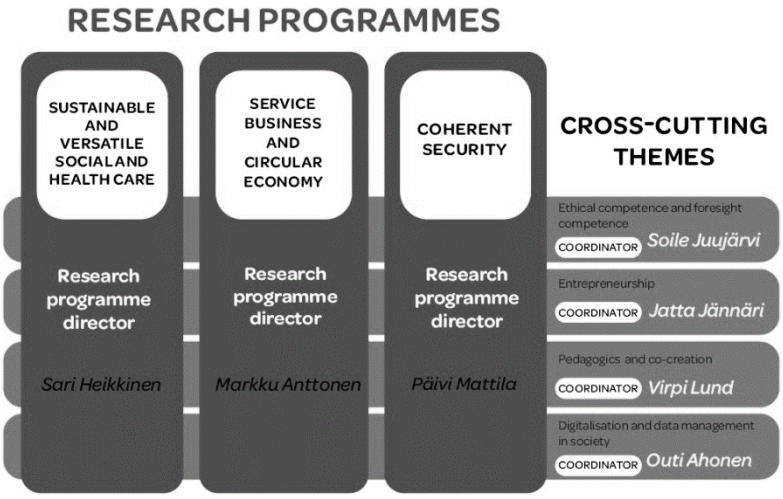
At the heart of Laurea's RDI work are citizens and social phenomena. Through a multidisciplinary approach, Laurea combines different disciplines and practices and uses co-development methods to conduct rapid experiments to find solutions and to create and promote competitive advantages. Laurea develops better services based on future needs and strong expertise in the social and health care sector, service business and circular economy, as well as in the security sector in cooperation with other actors in the Helsinki-Uusimaa region, such as companies, cities, and the third sector.

Laurea's research programmes in the sustainable and versatile social and health care sector, service business and circular economy, and coherent security are also at the heart of Laurea's degree programmes.

The research programme *sustainable and versatile social and health* care sector is responsible for the development and research activities of health, well-being and functional capacity, strengthening inclusion in society and taking into account ethical aspects, multi-professional cooperation, sustainable development and future needs in social welfare and health care services.

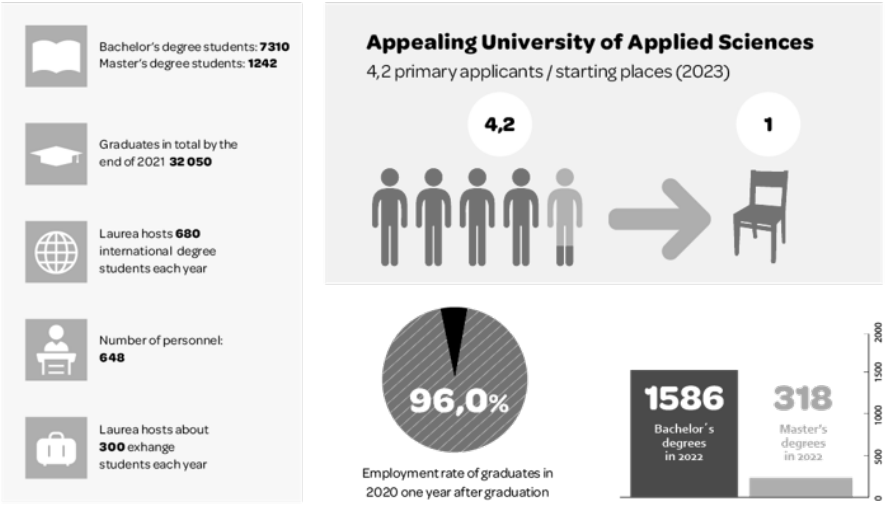
The research programme *Service Business and Circular Economy* provides, for example, a platform for research, co-development and implementation of business ecosystems, service innovations and solutions that promote sustainable development in accordance with the circular economy.

The core of research programme *Coherent security* is at the security, anticipation, and ensuring continuity of our internationalising and digitalising society, strategic management, and security management.



The Finnish Education Evaluation Centre (FINEEC) awarded Laurea the Quality label for Excellence of higher education in spring 2023 due to high-quality development work and interactive RDI activities. Laurea has shown innovative leadership, a long-term development approach and an inclusive operating culture. The evaluation panel considered Laurea's screens to be strong for the community and RDI activities. RDI activities are a close part of Laurea's overall strategy implementation and Laurea systematically strengthens the RDI competence of the entire personnel while continuously assessing the effectiveness of its operations. Laurea is Finland's leading university of applied sciences as a recipient of EU Horizon funding. Moreover, Laurea's RDI activities are linked to the long-term developed and impressive Learning by Developing (LbD) action model.

Picture: Laurea in numbers



Since 2019, Laurea has established key partnerships to strengthen students' employer networks and improve quality employment. The partner network is maintained in a goal-oriented manner and is systematically activated to strengthen Laurea's research and development activities and business operations. At the end of 2022, Laurea had 84 key partners.

Kiitokset / Acknowledgements

Kiitämme lämpimästi seuraavia yhteistyökumppaneita ja näytteilleasettajia tuesta konferenssin järjestämiseksi / We warmly thank the following institutions and enterprises for their support:

Laurea University of Applied Sciences
laurea.fi

Prizztech Oy
prizz.fi

Seinäjoki University of Applied Sciences
seamk.fi

PulseOn
pulseon.com

Medixine Oy
medixine.com

BeeHealthy
beehealthy.com

Hublet
gethublet.com

Häme University of Applied Sciences Smart-Unit
hamk.fi

DentView
dentview.fi

Diabetesliitto/ Finnish Diabetes Association
diabetes.fi

Savoa Partners
Savoapartners.fi

European Network of Living Labs (Enoll)
enoll.org

Spinverse
spinverse.com

Business Finland
businessfinland.fi

Health Proof Helsinki
healthproofhelsinki.fi

Special thanks to the Laurea University of Applied Sciences students for conference arrangements.

Table of content

Program

THURSDAY 12.10.2023

Venue/Paikka: Laurea Tikkurila Campus

10.00 Exhibitor registration opens
Laurea Tikkurila, Helsinki Region
Exhibitors can start at exhibition area

11.30 Participant registration opens
Laurea Tikkurila, Helsinki Region

Sessio 1: Sustainable digital services (session in English) **Auditoriums B101 and B303**
Chair President, Principal lecturer Outi Ahonen, Finnish Society of Telemedicine and eHealth, Laurea University of Applied Sciences

13.00 Conference Opening Words
Finnish Society of Telemedicine and eHealth opening words / President Outi Ahonen, FSTeH
Mari Vuolteenaho, Vice President (Research, Development and Innovation) at Laurea University of Applied Sciences

13.15 Ilkka Winblad Honorary Lecture: Digital health and sustainability transition of the health sector
Ilias Iakovidis, Adviser at DG CONNECT, European Commission

13.40 Finnish success story In Digital Health - Empowering citizens
Riikka Vuokko, PhD, Senior advisor, Ministry of Social Affairs and Health, Finland

14.00 Vision 2030 for the growth and competitiveness of the Finnish health sector
Petri Lehto, leading specialist, SITRA

14.20 Delivery of Finnish National eHealth Awards

Näyttely Posterit

14.30-15.15 Networking break, coffee and refreshments (served on 1st and 3rd floor), exhibition and posters

Sessio 2A: Reform of Healthcare, Social welfare and Rescue Services in Finland - year 2024 **Auditorium B101**
Chair Vesa Jormanainen, Finnish Society of Telemedicine and eHealth

15.15 Reflection of Starting a Wellbeing Service County
Kati Kristiansson (Marina Erhola), Director of Research and Development of Wellbeing County Pirha

15.30 Orpha codes for use in rare diseases in Finland
Satu Wedenoja, THL, Senior Medical Officer, Assistant Professor, HUS

15.45 Adapting Information Systems in a Wellbeing Service County
Risto Mäkinen, Savoa Partners Oy

16.00 5 min rapid scientific presentation (1-3)

O-1 Overall Anxiety Severity and Impairment Scale (OASIS) as an outcome measure in Internet-delivered Cognitive Behavioral Therapy (iCBT) for anxiety disorders;
Boris Karpov, Jari Lipsanen, Ville Ritola, Paula Laizane, Grigori Joffe

O-2 Primary care physicians' experiences on video and online chat consultations - a qualitative descriptive study;
Kaisa Kujansivu, Elina Tolvanen, Mervi Kautto, Tuomas H. Koskela

O-3 Managing tensions and paradoxes between stakeholders in MyData health ecosystem;
Fan Wang, Pasi Karppinen, Petri Ahokangas

Sessio 2B (Finnish)

Näyttely Posterit

16.15 Corporate presentation (1-3)
BeeHealthy

16.30 Networking break, coffee and refreshments (served on 1st and 3rd floor), exhibition and posters

THURSDAY October 12th 2023

Session 2B: Etäpalvelut käytännön työssä (Session in Finnish) **3rd floor Auditorium B303**
Puheenjohtaja: Aleksi Schrey, Ylilääkäri, YTHS

15.15 **Toteutuuko hoidon jatkuvuus**
Juha Auvinen, Professori, Oulun yliopisto

15.30 **Eettisyys ja laatu**
Riitta Luoto, ryhmäpäällikkö, ylilääkäri, tutkimusyksikkö, Kela

15.45 **Etävastaanoton parhaat käytännöt " Käypä" etävastaanotto**
Aleksi Schrey, Digitaaliset palvelut, ylilääkäri Chief Medical Officer (Digital health) at Finnish Student Health Service, YTHS

16.00 **5 min rapid scientific presentation (4-5)**

O-4 Tailored 3D Breast Models for Microwave Based Breast Tumor Monitoring/Detection Applications Scientific rapid presentation;
Mariella Särestöniemi, Jarmo Reponen, Teemu Myllylä

O-5 The use of digital occupational health services: Perspective of employer clients
Sari Nissinen, Sanna Pesonen, Pauliina Toivio, Erja Sormunen

16.15 **Corporate presentations (4-6)**
Savoa Partners
Medixine
PulseOn

16.30-17.00 **Networking break, coffee and refreshments (served on 1st and 3rd floor), exhibition and posters**

Session 2A (English) | **Posters** | **Exhibition**

TORSTAI 12.10.2021

Sessio 3A: Diversity of AI (Session in English) **1st floor Auditorium B101**
Chair: Jarmo Reponen, Professor, University of Oulu

17.00 **Human rights and biomedicine – the impact of AI on the doctor-patient relationship**
Lee Hibbard, Human Rights and Biomedicine Division, Directorate General – Human Rights and Rule of Law

17.20 **AI in Health Care Education**
Mikko Myllymäki, Senior lecturer, Savonia University of Applied sciences

17.40 **How AI is supporting Health Professionals in Radiology?**
Jussi Hirvonen, Professor, Clinical Medicine, Tampere University

18:00 **Data interoperability and data models for clinical information sharing**
Peeter Ross, MD, Ph.D., is a professor of e-health and the head of eMedLab of Tallinn University of Technology (TalTech), Estonia

18.15 **5 min rapid scientific presentations (7-8)**

O-7 Remote monitoring and predictive machine learning models in Parkinson's disease;
Laura Mäkitie, Maija Koivu, Veera Itälinna, Joonas Niskala, Eleonora Fiorenza, Luca Weis

O-8 An interactive web-based family intervention to promote cardiovascular health after preeclampsia (FINNCARE-study);
Anni Kivelä, Michelle Renlund, Seppo Heinonen, Minna Aittasalo, Taisto Sarkola, Hannele Laivuori, Tiina Jääskeläinen:

18.25 **Corporate presentations (7)**
HAMK Smart

18.30 **End of Day 1 sessions, accommodations**

Session 3B (Finnish) | **Posterit** | **Näyttely**

19.30-22.00 **Dinner** ***Tulisuudelma Restaurant at Sokos Hotel Vantaa***

Session 3B (3rd floor): Digitaaliset palvelupolut (Session in Finnish) **3rd floor Auditorium B303**
Puheenjohtaja: Liisa Klemola, lehtori, Savonia Ammattikorkeakoulu

17.00 **Kansalliset digitaaliset palvelut**
Jaana Kotila, kehittämispäällikkö HUS,
Leena Soininen, Chief Medical Officer, DigiFinland

17.15 **Digitaalinen palvelupolku osana hyvinvointialueen monikanavaista palvelua**
Merja Tepponen, Terveystieteiden tohtori, Lappeenranta

17.30 **Terveyskylän digipolku osana uniapneapotilaiden palvelupolkua**
Jari Haverinen, erikoissuunnittelija FinCCHTA, Pohjois-Pohjanmaan hyvinvointialue

17.45 **Tutkimus mielenterveyden hoitopoluista työterveyshuollossa koneoppimismenetelmiä hyödyntäen**
Pekka Varje, Tutkimuspäällikkö, Työterveyslaitos

18.00 **5 min rapid scientific presentations (9-12)**

O-9 Telephone Consultation as a sustainable method of service delivery in occupational medicine: results of a qualitative study;
Abigail O'Reilly, Conor Loftus, Hemal Thakore

O-10 Healthcare professionals' digital health competence profiles and associated factors; a cross-sectional study;
Erika Jarva, Anne Oikarinen, Janicke Andersson, Kristina Mikkonen

O-11 The extent and impact of digital services in healthcare and social welfare - An umbrella review;
Sanna Lakoma, Henna Härkönen, Anastasiya Verho, Paulus Torkki, Riikka-Leena Leskelä,
Paula Pennanen, Miia Jansson

O-12 HEI co-creating a service ecosystem for supporting digitalization in health and welfare;
Hannu Tikkanen, Outi Ahonen, Ruusa Ligthart, Anna Salmi

18.20 **Corporate presentations (8-9)**
Diabetesliitto
Hublet

Session 3A (English) **Posterit** **Näyttely**

18.30 **End of Day 1 sessions, accommodations**

19.30-22.00 **Dinner** ***Tulisuudelma Restaurant at Sokos Hotel Vantaa***

FRIDAY October 13th 2023

Session 4A: European legislation and regulation (Session in English) **1st floor Auditorium B101**
Chair Anna Salmi, Laurea University of Applied Sciences

9.00 **What does European Health Data Space bring to us?**
Markus Kalliola, Project director, SITRA

9.15 **Fin-OMOP Common Data Model at Auria Clinical Informatics**
Arho Virkki, Chief Analytics Officer, Wellbeing services county of Southwest Finland

9:30 **Research cooperation in Europe and beyond**
Kimmo Porkka, M.D, Ph.D. is a professor of clinical hematology at the University of Helsinki, clinical position at HUS Comprehensive Cancer Center Hematology Research Unit Helsinki

9.45 **5 min rapid scientific presentations (13-18)**

O-13 Participation and social inclusion through intelligent clothing – from handcrafted designs to tools supporting an individual's everyday life
Tiina Vuohijoki, Tiina Ihalainen, Sari Merilampi, Johanna Virkki

Session 4B (Finnish) **Posters** **Exhibition**

O-14 Effects of educational intervention on competence in digital well-being among professionals
Mimmi Saarinen, Krista Hylkilä, Aino Peltonen, Riina Jämsä, Sanna Tiuraniemi, Niko Männikkö, Merja Männistö, Johanna Jylhä-Ollila, Maria Kääriäinen

O-15 Students' evaluation of capabilities acquired in the Specialization Education in Digital Health and Social Care Services and their application in working life
Päivi Sanerma, Anna Rauha, Hanna Naakka, Outi Ahonen

O-16 Remote joint negotiation in supporting employee's ability to work -Enablers and challenges in the implementation of online meetings
Sanna Pesonen, Inka Koskela, Pirjo Juvonen-Posti, Erja Sormunen

O-17 Reverse mentoring in developing the digital competences of health care professionals
Merja Männistö

O-18 Digital competence and health literacy for those at risk of type 2 diabetes
Elisa Airikkala, Mari Laaksonen

10.30-11.00 **Networking break, coffee, refreshments, and exhibitions & poster session**

Session 4B: Haavoittuvat ryhmät (Session in English) **3rd floor Auditorium B303**
Chair: Soile Juujärvi, yliopettaja, Laurea

9.00 **Väestökyselyn tarjoama näkymä sosiaali- ja terveydenhuollon digitaalisten palveluiden käyttöön: ketkä jäävät ulkopuolelle?**
Maiju Kyytsönen, sh, TtM, väitöskirjatutkija, Digitaalisen sosiaali- ja terveydenhuollon seuranta, Palvelujärjestelmän tutkimus -tiimi
Hyvinvointivaltion tutkimus ja uudistaminen -yksikkö, THL

9.15 **Kanssa- ja puolesta asioinnin ammatilliset ja eettiset haasteet digitaalisissa sote-palveluissa**
Piia Silvennoinen, yliopettaja, Laurea

9.30 **Mielenterveyden ongelmat ja niiden vaikutus digitaalisten sote-palveluiden käyttöön**
Birgitta Tetri, asiantuntija, Laurea

9.45 **Videopuheluiden käyttö ikääntyneiden hoivatyössä**
Ville Mustola, väitöskirjatutkija, CoE AgeCare, Jyväskylän yliopisto

10.00 **5 min rapid scientific presentations**

O-19 Work Ability Data Management in Multisectoral Services for People with Disabilities
Sari Nissinen, Erja Sormunen, Nina Nevala

O-20 Registered nurses' assessments of a health / client information system after implementation;
Maiju Kyytsönen, Anu Kaihlanen, Kaija Saranto, Ulla-Mari Kinnunen, Tuulikki Vehko

O-21 Nurses Advancing Telehealth;
Claudia C Bartz

10.15 **Corporate presentations (13-15)**
Savoa Partners

10.30-11.00 **Networking break, coffee, refreshments, and exhibitions & poster session**

Session 4A (English) **Posterit** **Näyttely**

FRIDAY 13.10.2021 October 13th 2023

Sessio 5A: Data Security and Protection (Session in English) **1st floor Auditorium B101**
Chair: Paresh Rathod, senior lecturer, Laurea UAS

11.00 **The current cyber security issues in health and social care in 2023**
Petri Tolonen Cyber Security Specialist, KPMG Oy

11.15 **Resilience Management Framework for Critical Information Infrastructure: Designing the Level of Trust that Encourages the Exchange of Health Data**
Jyri Rajamäki, Principal Lecturer, Laurea UAS

11.30 **5 min rapid scientific presentations**

O-22 Factors associated with information security awareness among physicians and registered nurses: A comparative cross-sectional study;
Emma Kainiemi, Tarja Heponiemi, Jarmo Reponen, Kaija Saranto, Tinja Lääveri, Tuulikki Vehko

O-23 Assessing Information and Cybersecurity Training Needs among Social- and Healthcare Professionals;
Tiina Blek, Jaana Mäkelä, Tytti Solankallio-Vahteri

O-24 E-leadership in nursing – a systematic review;
Vanesa Numanovic, Julia Jacobsson

11.50-12.00 **Proceed to workshops**

Session 5B (Finnish) | **Posters** | **Exhibition**

Sessio 5B: Yhtenäinen terveys (OneHealth) **3rd floor Auditorium B303**
Chair: Paula Veikkolainen, LL, DI, Oulun Yliopisto

11.00 **One Health ja eläinterveydenhuollon digitalisaatio**
Eva Kaisti, Veterinarian, Founder and CEO of vetsy® Oy and Veteva Oy

11.15 **Suun terveydenhuollon rekisteritieto ja tiedon hyödyntäminen**
Ulla Harjunmaa, Chief dentist at Finnish Institute for Health and Welfare (THL)

11.30 **5 min rapid scientific presentations**

O-25 Dental selfies for e-assessment of oral diseases;
Katri Kukkola, Elina Väyrynen, Saujanya Karki, Laura Pentti, Ville Kaikkonen, Eero Molkoselkä, Marja-Liisa Laitala

O-26 Attitudes and capabilities of medical students towards eHealth and digitalization: a comparative longitudinal study in 2016–2022;
Paula Veikkolainen, Timo Tuovinen, Erika Jarva, Jonna Juntunen, Petri Kulmala, Anna-Maria Tuomikoski, Merja Männistö, Jarmo Reponen

O-27 Registered Nurses assessments Kanta services in their perspective of their work;
Tuulikki Vehko, Maiju Kyytsönen, Vesa Jormanainen, Ulla-Mari Kinnunen, Kaija Saranto

11.45 **Corporate presentation (17)**
Dentview

11.50-12.00 **Proceed to workshops**

Session 5A | **Posters** | **Exhibition**

Session 6 (Classrooms at 3rd floor): Workshops
The workshops aim at providing participants with deeper knowledge of eHealth and telemedicine product development in testbed environment. This is also an opportunity for networking, discussion, and knowledge sharing.
Note: Language in the workshops is English if there is a non-Finnish speaker in the workshop.
Chair: Workshop facilitators

14.00-13.00 **Workshop agenda**
Each workshop will start with a short introduction from the organizers. Each workshop will be hosted and facilitated with two or more experts on the topic and with the help of students from Laurea University of applied sciences.
Workshops will be facilitated by World Café Method which is a structured conversational process for knowledge sharing. Groups of people discuss a topic at small tables like those in a café. Some degree of facilitation and formality may be

	retained to make sure that everyone gets a chance to speak. Pre-defined questions have been agreed upon beforehand with the hosts, but the outcomes or solutions are not decided in advance. ***Timetable for workshops:*** *12.00-12.10 Introductions and instructions for the workshop* *12.15-12.30 Table 1 discussions* *Switch tables* *12.35-12.50 Table 2 discussions* *12.50-13.00 Summary*
	WS1: Regulation and ethical aspects of medical devices (Lääkinnällisiin laitteisiin liittyvä regulaatio ja eettisyyskysymykset) *Sandra Liede, Healthtech Finland/Terveysteknologia ry* *Annika Takala, HUS, User point of view* *Questions in the workshops*
	WS2: Preventive digital tools for supporting healthcare workers wellbeing *Laura Tahvanainen, RDI Specialist Laurea UAS, Wellbeign to Healthcare ESF-project* ***Virtually participating**: Dr Manon Truchon (Ph.D. in psychology), professor at the School of Psychology at Laval University, Quebec.* ***Virtually participating:** Dr. Mahée Gilbert-Ouimet (Ph.D. in epidemiology), associate professor in population health, Department of Health Sciences, Université du Québec à Rimouski.* *Questions in the workshops* *1. What should we do next with the data that the digital solutions are producing in terms of prediction?* *2. How to enable employer participation/engagement in development processes?*
	WS3: International cocreation with testbeds *Katariina Rouvinen, Health Proof Helsinki* *Riikka Paasikivi, Spinverse Oy, Business Finland* *Questions in the workshops* *1. How can a company in testbed environment collect references in Finland before the globalization?* *2. What are the experiences of companies within the HUS testbed about expanding from Finland to global markets?*
	WS4: Roadmap to transnational and interorganizational collaboration among Health Care innovation ecosystems (Enoll) *Evdokimos I. Konstantinidis MSc, PhD Medical Informatics Electronics Engineering European Living Lab Network)* *Teemu Santonen, Principal lecturer, Laurea UAS* *Questions in the workshops*
	WS 5: What testbeds can offer and what is needed from the companies? (Mitä testbedit tarjoavat ja mitä yrityksiltä vaaditaan? Minkälaisia asioita yrityksen tulee huomioida tuodessaan yrityksensä tuotteen testbed ympäristöön.) *Mervi Vähätalo, coordinator of Satakunta Testbed* *Niina Holappa, project manager, Satakunta Testbed, Prizztech Oy* *Questions in the workshops* *1. How should the testbed services be developed from companies' point of view?* *2. What kind of co-operation would be beneficial for wellbeing and health technology to be adapted to the field?*
13.00-14.00	**Lunch at Laurea Restaurant (1st floor)**

Session 7: Session 7 (1st floor): Future Visions (of Digital Health and Welfare) Auditoriums B101 and B303
Chair: President Outi Ahonen, Finnish Society of Telemedicine and eHealth

15.15	**Toteutuuko hoidon jatkuvuus** *Juha Auvinen, Professori, Oulun yliopisto*	)	**Posters**	**Exhibition**
14.00	**Population Health and Preventive Care** *Ilkka Kunnamo, Development Director, Duodecim Publishing Company Ltd/EBMEDS*			
14.45	**Finnish Society of Telemedicine and eHealth closing words** *President Outi Ahonen, FTeHS*			
16.00	**Farewell**			

Session 1: Sustainable digital services

Chair: President, Finnish Society of Telemedicine and eHealth Outi Ahonen

Thursday 12th of October 2023

9:30 – 10:50

1-1 **Finnish Society of Telemedicine and eHealth opening words**
Outi Ahonen, President
Finnish Society of Telemedicine and eHealth

Laurea University of Applied Sciences opening words
Mari Vuolteenaho, Vice president
Laurea University of Applied Sciences

1-2 **Ilkka Winblad Honorary Lecture: Digital health and sustainability transition of the health sector**
Ilias Iakovidis, Adviser at DG CONNECT
European Commission

1-3 **Finnish approach to Digital Health – Empowering citizens**
Riikka Vuokko, PhD, Senior Advisor, Minister of Family Affairs and Social Services
Ministry of Social Affairs and Health, Finnish Government

1-4 **Vision 2030 for the growth and competitiveness of the Finnish health sector**
Petri Lehto, leading specialist
SITRA

1-5 **Delivery of eHealth Awards**

Finnish Society of Telemedicine and eHealth opening words

Outi Ahonen, President
Finnish Society of Telemedicine and eHealth (FSTeH)

Biography Outi Ahonen

Outi Ahonen Dr of Health and Human Services Informatics, PhD, MHSc, RN works a as principal lecturer in master's degree Digital unit at Laurea University of Applied Science (Laurea). She coordinates the research theme of digitalization and information management in society at Laurea UAS. She has been the project manager in many projects, were developed digital competencies. She was the project manager in SotePeda 24/7 (2018-2020) national project where developed competences for eHealth and eWelfare Services in multiprofessional teams. Currently she is the project Manager in Managing Digital Transformation in the Health Sector MangiDITH-project, where are 8 partners creating interdisciplinary and International Master studies. She also works as vice project manager in special education to eHealth and Welfare Services, in the UUDO-project where there are 14 universities of applied sciences. Her main research interest is multidisciplinary competences in developing digital services in eHealth and welfare. She is also a vice-member of the Council of the Finnish Nursing Association. She has been the chair of the expert team developing the eHealth Strategy for the Finnish Nursing Association.

This year we are having our annual Finnish National Conference on Telemedicine and eHealth for the 28th time. The theme of the Conference is "Human oriented approach in eHealth and digital services".

This is the second time our annual conference is arranged in Laurea. The time was 2015. This year 2023 we have a special year in Finland because we have transferred from the 309 municipal system to the 21 wellbeing services county model. These counties will enable citizens to have more uniform services in health and social care. According to the strategy of the Ministry of Social Affairs and Health, electronic services are the primary services for encountering citizens. Our conference now has an excellent opportunity to hear the views of different actors on how the electronic services of the wellbeing services counties have been launched and we can share ideas from different perspectives.

The new health and social reform is giving even better opportunities for collaboration between wellbeing services counties and higher education institutions more strongly in research, development, and innovation activities. We have chosen "Human oriented approach in eHealth and digital services" as the theme of the conference. Human-centered service development is particularly important in social and health care. Of course, evidence-based recommendations, national laws, and EU directives must be considered as the background during the service design approach.

In this conference, together with service designers from Laurea, we have developed a workshop concept that aims to give participants the opportunity to strengthen their competence in their chosen topic through active interaction with other participants. The topics chosen for this workshop concept are an entity that supports the creation of innovations by utilizing testbeds or digital living labs. We would like to thank the workshop expert leaders and service design students for organizing the workshops. Workshops offer unique possibilities to get hands-on experience in solutions for better and more effective healthcare.

At the same time when our social and health care is changing with digitalized technology, our society is changing how people can take part in discussions via different kinds of networks and platforms. Telemedicine and eHealth Society is willing to be one of these networks and platforms for our members who are interested in taking part in the exchange and innovative ideas around digital health care in a multidisciplinary context. Our Society will contact its members during this autumn of 2023 through different ways to understand the needs of the members. Laurea service design students and their teachers´ Marja Isokangas and Antti Keskitalo are leading the service design process to find new ways of activating and communicating with members of our society.

The Laurea University of Applied Silences gives a great environment to the conference, which brings together top experts, researchers, large and small companies both regionally, nationally, and internationally; decision-makers from both the public and private sectors and, of course, start-ups and young future health and welfare professionals. In the sessions, practical examples and experiences are shared by more than 40 lecturers from Finland and abroad.

I wish everybody a very fruitful conference and I hope you will also have time to experience the City of Vantaa!

Laurea University of Applied Sciences opening words

Mari Vuolteenaho, Vice President, Research, Development and Innovations
Laurea University of Applied Sciences

Biography Mari Vuolteenaho

Mari Vuolteenaho works as Vice President for Research, Development and Innovations at Laurea University of Applied Sciences. She is based in Vantaa, Finland. She holds a Doctor of Science (Technology) degree from Helsinki University of Technology, current Aalto University, in the field of engineering physics. She has previously worked for VTI Technologies, current Murata, and Aalto University as the Head of Research and Innovation Services. Her current goal is to boost the volume and impact of research and development at Laurea.

Ilkka Winblad Honorary Lecture: Digital health and sustainability transition of the health sector

Ilias Iakovidis, Adviser at DG CONNECT
European Commission

Biography Ilias Iakovidis

Ilias works on maximising the positive impact of digitalisation on the green transition. He has initiated the European Green Digital Coalition (EGDC) whose members have committed to work on science-based methods to estimate the net environmental impact of digital solutions and on guidelines for green digital transformation in different sectors (energy, transport, construction, agriculture, etc). He manages the European Parliament Pilot project that supports the work of EGDC. Ilias works also on the Digital Product Passport as introduced in the Eco-design for Sustainable Product Regulation and co-manages the EU project CIRPASS. The aim is to accelerate the transition circular economy through digitally enabled sustainable business models (e.g. product as a service).

Before 2017 Ilias has contributed to the EU Agenda of eHealth and ICT for Active and Healthy Ageing for over 20 years. Areas he pioneered include digitally supported Integrated Care, 'Virtual Physiological Human', Personal Health Systems and Electronic Health Records.

About the Ilkka Winblad honorary lecture:

In order to honor the memory of Adjunct Professor Ilkka Winblad from University of Oulu, a former vicepresident of the society, who passed away in 2011, The Finnish Society of Telemedicine and eHealth decided to start in 2012 a series of honorary lectures, asking a prominent person in the international eHealth field to summarize his/her experience. According to the plan, this keynote lecture will be in the conference program at least every second year, especially on cruising conferences which by their nature are already international meetings.

As Ilkka Winblad was the first de facto professor of clinical telemedicine and eHealth in Finland during his years at FinnTelemedicum, University of Oulu, and had built the basis for new research directions and education in the field, also the keynote is expected to reveal an extended perspective and future targets. The first ever honorary lecture was given by Professor Richard Wootton from United Kingdom in 2012.

The successive lectures have been given by Professor Christian Nohr from Denmark in 2014, Professor Stanton Newman from United Kingdom in 2015, Associate Professor Piotr Henryk Skarzyñski from Poland in 2017 and Global Strategist Lucien Engelen from Netherlands in 2019.

Finnish approach to Digital Health – Empowering citizens

Riikka Vuokko, PhD, Senior advisor
Ministry of Social Affairs and Health, Finland

Biography Riikka Vuokko

Ms. Riikka Vuokko is responsible for planning and directing the development of digitalization and information management in social and health care at national strategic level. She is responsible for the national enterprise architecture development, especially in the areas of primary use of health data including citizens' own services and advancing interoperability within the services. Regarding the government program, she leads the development for medication information management. She is Finnish representative in the eHealth Network and supports deployment of European eHealth goals at national level strategic planning. Currently she is also coordinating the preparation of national digitalization strategy for social and health care. She has also an ongoing research collaboration with the Helsinki University Hospital on topics of health informatics.

Vision 2030 for the growth and competitiveness of the Finnish health sector

Petri Lehto, leading specialist
Sitra, Finland

Biography Petri Lehto

Petri is an innovation and research policy expert having a wide work experience in the field in various leading positions. Petri has an extensive background from Government policy making having led as a director the Finnish innovation policy for several years at the Ministry of Economy and Employment. After the Ministry, Petri moved to work for a global pharmaceutical company where he led the company's policy and communications work as a director. As part of that work, he chaired for several years the Finnish Pharmaceutical Industry Association's committee work on innovation and research and also served as a Member of the Associations's Board. Currently, Petri works as a Senior Lead at Sitra where his work centers around health data. Petri also works for the University of Helsinki as a Development Director where he is currently collaborating on a project which intends to establish a precision cancer care R&D ecosystem in Finland. Lately, Petri has also worked for FINBB, the Finnish Biobank Cooperative, where his role has been to strengthen the sustainability of Finnish biobanks. By education, Petri is an economist having earned his Ph.D. from University of Turku and his Master's degree from the Johns Hopkins University in the USA.

Finnish National eHealth Award

Finnish National eHealth award is delivered by President and Secretary of the Finnish Society of Telemedicine and eHealth.

The Board of Finnish Society of Telemedicine and eHealth delivers annually national eHealth award. The award is based on significant accomplishments in the field of telemedicine and eHealth. The required activity can be for example a doctoral thesis in this area or some other important activity in the national or international level supporting the society's goals. The award is delivered during annual Finnish national conference on telemedicine and eHealth. In the year 2023, Finnish national eHealth award is delivered for the 20th time.

Lifetime Achievement eHealth Award

The Board of Finnish Society of Telemedicine and eHealth decided to deliver during the 28th Finnish National Telemedicine and eHealth Conference one joint eHealth award emphasizing both the recipients´ personal achievements and their seamless collaboration in their life-long work for the benefit of telemedicine and eHealth:

Kaija Saranto

Education: nurse, specialist nurse, nursing teacher, master's degree in health care and doctorate in health sciences. Her dissertation is called Outcomes of education in information technology: towards a model of Nursing Informatics education. She was awarded a docent from the University of Kuopio in 2000 and a professorship in Social and Healthcare Information Management in 2006.

Professor Emerita Saranto plays a pioneering role in education, research, and practical development of information management in social and health care. Since 2000, Saranto has been responsible for Finland's unique and internationally accredited social and health care education and research and acted as an expert in working groups nationally and internationally. Accreditation has been granted by the International Medical Informatics Association (IMIA) in 2012 and 2018. Healthcare development work related to patient safety has also been very significant. She has been founding Finland's first treatment effectiveness and patient safety research center (RECEPS) in Kuopio. Saranto has supervised numerous dissertations on social and healthcare information management. Saranto has participated in Finnish nursing terminology development work. She has been founding the collaboration center of the Finnish Joanna Briggs Institute, whose task is to develop evidence-based health care. She has also been an active player in the introduction of the special qualification title for nursing information management granted by the Nurses' Association since 2012. Saranto has also been preparing the strategy for Finnish Nurses' electronic health services in 2015 and 2021. She has a wide range of positions of trust in the Finnish Nurses' Association (Information Management Group), the Nursing Research Foundation, the Social and Healthcare Information Processing Association,

expert positions at various universities in Finland and abroad; Chairman of The Association for Common European Nursing Diagnoses, Interventions and Outcomes (Acendio), chairman of IMIA's Nursing SIG Education group and member of the editorial board of international journals. Saranto was elected as the first Finnish member of the American College of Medical Informatics (ACMI) expert community in 2012. In 2013, she was elected as an international member of the American Academy of Nursing (ANN) in a network of more than 2,000 nurses. The International Medical Informatics Association (IMIA) chose Saranto as the only Finnish member of the new International Academy of Health Science Informatics (IAHSI) it founded in 2017. Membership of the Academy is one of the highest recognitions for expertise in the field. The Nurses' Education Foundation awarded the 2021 Venny Snellman Award for brave, innovative and successful activities to Saranto, who developed data management analytics and remote care in the health science.

eHealth Award for important doctoral dissertation

The Board of Finnish Society of Telemedicine and eHealth decided to deliver during the 28th Finnish National Telemedicine and eHealth Conference one joint eHealth award emphasizing both the recipients´ personal achievements for the benefit of telemedicine and eHealth:

Juhamatti Huusko (KTM, YTT, HHJ) PhD, Entrepreneur. He defended his doctoral thesis 16.6.2023 at the University of Eastern Finland, Dissertations in Social Sciences and Business Studies.

Health technology has a significant role in health care and is used for instance in the prevention, diagnosis and treatment of diseases. This study examines the Medical Device Regulation (2017/745, MDR) and in this study medical devices that fall under the MDR are referred to as health technology. One of the main objectives of MDR is to improve patient safety. The purpose of the study was to evaluate and describe the information needs of health technology enterprises, their methods for information seeking and how the information is used and managed. Little research has been done on the topic of the study. The study brings novel information.

In this study, information behavior consists of three activities: information need, information seeking and information use. The study aimed to propose recommendations related to the information behavior of health technology enterprise managers and regulatory experts and the regulation of medical devices. The information behavior of the managers and regulatory experts of health technology enterprises is guided by industry regulation, and the information culture of the enterprises is influenced by outside norms and rules such as national and European Union level guidance. Based on the results, it is recommended that a MDR platform is created where all relevant information is available, and which could help health technology enterprises to manage and meet regulatory requirements. It is also important to increase research on health technology enterprises and MDR by emphasizing the importance of health technology in modern healthcare and increasing research funding. Awareness of health technology should be heightened so that healthcare professionals, patients and consumers know how to distinguish medical devices from general wellness devices that fall outside the MDR.

https://erepo.uef.fi/handle/123456789/29749

Sessio 2A: Reform of Healthcare, Social welfare and Rescue Services in Finland - year 2024

Chair: Vesa Jormanainen, Finnish Society of Telemedicine and eHealth

Torstai 12.10.2023 - Thursday 12th of October 2023

15:12 – 16:30

2A-1 Reflection of Starting a Wellbeing Service County

Kati Kristiansson (Marina Erhola)
Director of Research and Developmentof Wellbeing County Pirha

2A-2 Orpha codes for use in rare diseases in Finland

Satu Wedenoja
Senior Medical Officer, THL, Assistant Professor, HUS

2A-3 Adapting Information Systems in a Wellbeing Service County

Risto Mäkinen
Savoa Partners Oy

5 min rapid scientific presentations

O-1 O-1 Overall Anxiety Severity and Impairment Scale (OASIS) as an outcome measure in Internet-delivered Cognitive Behavioral Therapy (iCBT) for anxiety disorders

Boris Karpov[1], Jari Lipsanen[2], Ville Ritola[1], Paula Laizane[3], Grigori Joffe[1]
[1]Department of psychiatry, Helsinki University Hospital; University of Helsinki, Helsinki, Finland
[2]Finnish Psychological Association, Helsinki, Finland
[3]Riga Stradins University, Riga, Latvia

O-2 Primary care physicians' experiences on video and online chat consultations - a qualitative descriptive study

Kaisa Kujansivu[1,2], MD, Elina Tolvanen[1,3], MD, PhD, Mervi Kautto[1,2], MD, PhD, Tuomas H. Koskela[1,4], MD, PhD
[1] Faculty of Medicine and Health Technology, Tampere University
[2] Pihlajalinna Oy
[3] Pirkkala Health centre, Pirkanmaa wellbeing services county
[4] Centre of General Practice, Tampere University Hospital

O-3 Managing tensions and paradoxes between stakeholders in MyData health ecosystem

Fan Wang, Pasi Karppinen, Petri Ahokangas
[1]Student in Health and Human Services Informatics, Faculty of Social Sciences and Business Studies, University of Eastern Finland

Reflection of Starting a Wellbeing Service County

Kati Kristiansson
Director of Research and Development of Wellbeing County Pirha

Biografia Kati Kristiansson

Kati Kristiansson serves as the Director of Research and Development at the Wellbeing Services County of Pirkanmaa, where she leads the Research, Development, Training, and Innovation division. The division oversees major development initiatives within the region's healthcare services and provides support for various research projects. Kristiansson holds a Specialist Qualification in Management and has an extensive academic background. She has a Ph.D. in Medical Genetics and possesses twenty years of experience as a researcher in the field of genomics, common complex diseases, and public health at the Finnish Institute for Health and Welfare and its predecessor organizations.

The reform of wellbeing services in Finland has a long history, over 17 years of legislative preparation under eight different governments. The Finnish reform is the largest wellbeing services / health care reform in the world thus far. The historic start of 21 self-governing wellbeing services counties was finally realized on 1 January 2023.

The responsibility of organizing public health and social services as well as rescue services was transferred from the municipalities to 22 wellbeing services counties. The initial period of shifting from previous separate and fragmented municipal services into a larger jointly governed entity commenced well. The main focus has been guaranteeing safe transition of services, customers and employees with no great disturbances in the production of services. The Pirkanmaa wellbeing services county is the largest in Finland, providing services for over half a million inhabitants, with a budget of 2.6 billion euros and employing approximately 20 000 staff members.

In the Pirkanmaa wellbeing services county, we have a regional reform policy which has been approved by the elected county council. This reform policy details the necessary targets, measures, indicators, risks and regional analysis as well as responsible parties for the upcoming 2 – 3 years.

The challenges in the first leg of the change are challenged by the gradual recovery from the covid pandemic which has led into growing number of patient queues and overburdened healthcare personnel along with ever growing labor shortage in the health and social care. Meanwhile the diminished government funding proposes new challenges for the future of all wellbeing services counties.

Based on the previous experiences from other parts of the world on smaller scale reforms, we have raised five points to the core of our operations in order to ensure our success. These are political commitment and decision-making ability, regional reform policy, uniform leadership structure and core transformation group, competence and the ability to inspire and involve the personnel in the change.

Orpha codes for use in rare diseases in Finland

Satu Wedenoja, Senior Medical Officer, Assistant Professor
THL (Finnish Institute for Health and Welfare), HUS

Biography Satu Wedenoja

Satu Wedenoja, MD, PhD, works as a Senior Medical Officer at the Finnish Institute for Health and Welfare. Her field of specialty is obstetrics and gynecology. Wedenoja, together with her team, is responsible for the coordination of rare diseases in Finland. This task involves both national and international projects and collaboration in the field of rare diseases. Major aims of the national coordination team include implementation of ORPHAcodes into electronic patient report systems and specialized care in Finland. Precise coding of rare diseases using ORPHAcodes allows epidemiological analyses and data gathering. The implementation of the ORPHAcodes is therefore a huge leap towards better diagnostics and treatment of rare diseases and a national knowledge base.

Rare diseases is a large and heterogeneous group of more than 7,000 different disorders. The only common nominator is the rarity. The European definition of a rare disease is the prevalence of no more than five persons per 10,000. Most rare diseases are, however, ultrarare. This means that a disease affects no more than one person per million people.

At the level of EU, the challenges of rare diseases and cross-border healthcare have resulted in implementation of the virtual knowledge networks for rare diseases (ERN, European Reference Networks for low prevalence and complex diseases). Moreover, development of the European knowledge base has been active.

Orphanet database (www.orpha.net) is the largest and most well-known data resource in the field of rare diseases. Orphanet is an EU-funded consortium involving almost 40 different countries. Orphanet database includes a description for more than 6,000 rare diseases and the specific ORPHAcode for each rare disease. The ORPHAcodes are short series of numbers, such as ORPHA:803 (ALS, amyotrophic lateral sclerosis).

In Finland, there are estimated 300,000 patients with rare diseases. Of them, only around 350 have an exact ICD-10 diagnosis code. Therefore, using ICD-10 codes in electronic patient report systems cannot make individual rare disorders visible. For example, ICD-10 code G72.8 for “other specific myopathies” can be the code for hundreds of different rare diseases. When no specific diagnosis codes for rare diseases exist, their prevalence and the number of patients cannot be estimated.

All Finnish university hospitals have implemented the ORPHAcodes in 2023. When the physician records an ORPHAcode for the patient in connection with a treatment or visit, the code will be transferred to the list of the patient’s diasnoses. Moreover, a separate field for the ORPHAcode in the Care Register of the Finnish Institute for Health and Welfare (THL) makes possible to collect the ORPHAcodes and the information recorded in healthcare visits at the national level. THL is responsible for the national coordination of rare diseases and participates in an EU project (OD4RD2) aimed at promoting the implementation of the ORPHAcodes in the Member States.

ORPHAcodes will make monitoring the prevalence and care paths of rare diseases possible at the national level. Collecting disease-specific information nationally and internationally advances the diagnostics and treatment. The codes also provide new opportunities to carry out clinical and pharmaceutical research on rare diseases.

Adopting Information Systems to facilitate Digitalization and Leadership in a Wellbeing Service County

Risto Mäkinen
Savoa Partners Oy

Biography Risto Mäkinen

Risto ei ole toipunut 17 vuoden urasta käytännön lääkärinä perusterveydenhuollossa ja vuonna 1981 kokemastaan Terveysportin vision esittelystä. Ratkaistavana on edelleen potilaan hoitoonpääsy ja tarkoituksenmukainen hoito, sekä sähköisten välineiden järkevä hyödyntäminen.
Päätoiminen kehittämistyö kenttäolosuhteissa kansallisesti antoi kuvan perus- ja erikoistason toimintamalleista ja edellytyksistä; viisi vuotta rakentamassa astmahoitajaverkostoa Filha ry:ssä ja viisi vuotta kehittäjäosaajia STM:n Rohto-keskuksessa. Kahdeksan vuotta johtajalääkäriyttä Hämeenlinnan ja Helsingin perusterveydenhuollossa toi kuvan uudistamisen johtamisesta
Hämeenlinnassa rakennettiin Sitran rahoituksella Duodecimin kanssa EHR-integroidut oirearvioalgoritmit ja sähköinen terveystarkastus, ja uudistettiin terveyskeskuksen palvelukonsepti. Savoa Partners Oy on vuodesta 2017 jatkanut samalla polulla: sote-keskus saadaan jonottomaksi ja vaikuttavaksi, kunhan hoito alkaa heti, yksi ammattilainen koordinoi sen toteutuksen valmiiksi saakka moniammatillisen tiimin tuella, yhteydenotto on oletusarvoisesti sähköinen ja hoito etänä, sekä kansansairauksien hoito painottuu etiologisiin tekijöihön eikä seurauksiin. Johtaminen perustuu asetettujen tavoitteiden systemaattiseen seurantaan tiedolla johtamisen välinen.
Tämän toteutus tulee kuvatuksi alustuksessanikin.

CEO, Savoa Partners Oy 2017-
Head of the Health Care Services, City of Helsinki, Department of Social Services and Health Care 2014-16
Chief Medical Officer, City of Hämeenlinna, Health care Services 2010-14
Senior Medical Officer, Centre for Pharmacotherapy Development 2005-09

A wellbeing service county faced serious problems with overflow of patients from a neighbour county year 2021. To hire more professionals was not possible due to general shortage of doctors and nurses. Therefore, the processes of care should be re-designed to raise productivity and effectiveness, which were the aims of the project.

The processes were totally re-designed in a serie of workshops with leaders and professionals.

The new processes had key actions, e.g patient’s contacts to health centre should be digital, she/he should get a care manager, the essential risks for chronic diseases should be recorded, and patients with chronic conditions should have a health and care plan.

To monitor and lead the change a set of indicators were developed, and the recording of these in every contact was implemented. This created a database for business intelligence/knowledge management. What it contained, and how it was used will be demonstrated.

O-1: Overall Anxiety Severity and Impairment Scale (OASIS) as an outcome measure in Internet-delivered Cognitive Behavioral Therapy (iCBT) for anxiety disorders

Boris Karpov[1], MD, PhD, Jari Lipsanen[2], PhD, Ville Ritola[1], Paula Laizane[3], MD, Grigori Joffe[1], MD, PhD
[1] *Department of psychiatry, Helsinki University Hospital; University of Helsinki, Helsinki, Finland*
[2] *Finnish Psychological Association, Helsinki, Finland*
[3] *Riga Stradins University, Riga, Latvia*

Introduction: Anxiety disorders (ADs) are prevalent psychiatric conditions, associated with a decreased quality of life [1]. Cognitive-behavioral therapy (CBT) and its computer-assisted, internet-delivered, asynchronous version (iCBT) are effective in the treatment of ADs [2]. Disorder-specific, self-rated symptom severity scales used as outcome measures in both conventional CBTs and iCBTs are relatively long and time-consuming. In iCBT, decreased user satisfaction and weakened adherence has been linked with patient-reported lack of time or being too busy. This calls for other, brief, and easy-to-use instruments. Overall Anxiety Severity and Impairment Scale (OASIS) [3] appears to fill such requirements. However, while well established for conventional CBT, feasibility of OASIS for iCBT has not been explored, yet. To elucidate its feasibility for iCBT, we have investigated relationships between OASIS and disorder-specific measures in iCBT for ADs. We hypothesized that OASIS would show positive associations with these "gold standard" measurements, meaning that 1) it can be successfully used in iCBTs of ADs and 2) that in iCBTs for ADs, it could have potential as a transdiagnostic effectiveness measure.

Material and Methods: Helsinki University Hospital (HUS) provides original Finnish-language nationwide iCBT programs (HUS-iCBT) for a range of psychiatric disorders. Our study is a cross-diagnostic, observational, "real world" (i.e., focused on regular clinical practice) study. We examined HUS-iCBT datasets on general anxiety disorders (GAD, a 12-session program), obsessive-compulsive disorder (OCD, 10 sessions), panic disorder (PD, 10 sessions), and social anxiety disorder (SAD, 7 sessions). The disorder-specific measures were, correspondingly, Generalized Anxiety Disorder 7-item scale (GAD-7), Obsessive-Compulsive Inventory (OCI-R), Penn State Worry Questionnaire (PSWQ), and Social Phobia Inventory (SPIN). OASIS was employed in all four programs. General linear model for repeated measures and interaction analysis were used for investigating the relationships between OASIS and disorder-specific scales from first to last session. Separate models were built for every pair of OASIS and a disorder-specific scale.

Results: The proportion of females was 76.8% (n=5528) in GAD therapy, 65.3% (n=1330) in OCD, 67.6% (n=1856) in PD, and 56.6% (n=1645) in SAD. Mean age of the patients was, respectively, 33.6 years (SD 11.6), 29.9 years (SD 9.6), 32.7 years (SD 11.2), and 30.5 years (SD 10.2). In the first session, 5504 patients filled in OASIS in GAD therapy, 1318 patients in OCD therapy, 1778 patients in PD therapy, and 1636 patients in SAD therapy. The corresponding figures for the last session were 2714 (49.3%), 604 (45.8%), 401 (22.5%), and 450 (27.5%). The main effect of linear mixed models indicated a clear association between OASIS and disorder-specific scale scores. Interaction analyses demonstrated a stable association between OCI and PDSS from first session to last, while GAD-7, PSWQ, and SPIN interrelated with OASIS more strongly at the last session than at the first one. The correlation analyses demonstrated significant associations between changes in mean scores of OASIS and disorder-specific scales in all therapies.

Discussion: OASIS demonstrates clear-cut and relatively stable associations with disorder-specific symptom measures in iCBT for a range of ADs. Our results suggest that OASIS might have a transdiagnostic outcome measurement potential in iCBT. Considering the benefits of OASIS as a short and easy-to-use self-rating scale, it might offer a worthwhile option as an outcome measurement for iCBT programs for ADs in regular clinical practice.

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[3]Norman SB, Campbell-Sills L, Hitchcock CA, et al. Psychometrics of a brief measure of anxiety to detect severity and impairment: the Overall Anxiety Severity and Impairment Scale (OASIS). J Psychiatr Res. 2011;45(2):262-268.

O-2: Primary care physicians' experiences on video and online chat consultations - a qualitative descriptive study

Kaisa Kujansivu[1,2], MD, Elina Tolvanen[1,3], MD, PhD, Mervi Kautto[1,2], MD, PhD, Tuomas H. Koskela[1,4], MD, PhD
1 Faculty of Medicine and Health Technology, Tampere University
2 Pihlajalinna Oy
3 Pirkkala Health centre, Pirkanmaa wellbeing services county
4 Centre of General Practice, Tampere University Hospital

Introduction: Health care services are changing with the increasing use of eHealth solutions. Instead of traditionally meeting patients face-to-face, consultations can be performed via video and chat tools. Patients have been satisfied with remote consultations (1,2) but the clinicians have seemed to be more cautious (2). In addition, the increase in digital solutions brings changes to primary care physicians (PCPs) work; communication with patients differs from face-to-face appointments, especially with written communication via chat tools (3). When the clinical examination is not possible to perform, a PCP has to make decisions with incomplete information. However, working remotely could bring new possibilities for arranging general practitioners' work more suitable for their family lives and help to cope at work. We wanted to find out, what advantages and disadvantages the PCPs faced in remote consultations, and how working remotely has affected them.

Material and Methods: The methodological orientation of this study is a thematic analysis based on the phenomenological theory of the description of the participants' personal subjective experiences. We conducted semi-structured focus group interviews with 17 PCPs, divided into 4 groups. All PCPs had the experience of working remotely and using chat or video tools. The interviews were performed and recorded via Microsoft Teams. The recordings were transcribed, and the transcriptions were anonymized. The material was analysed and coded according to the thematic analysis process by all 4 research group members. Each member performed the analysis and coding separately and the main researcher sorted and merged the codes. With the first round of analysis, the data was found to be saturated in the four interviews.

Results: Two main themes emerged from the data: 1) The effects of remote consultations in the practical work of a PCP, and 2) the effect of the remote consultations on the service system and the patient. These two main themes were divided into subthemes at this point of analysis. The first main theme was divided into four subthemes: a) Doctors' new way of working, b) The effect on PCP's well-being at work, c) special characteristics of communication in remote consultations, and d) competencies required for a PCP. The second main theme was divided into three subthemes: a) smoothness and easiness, b) the adequate use of resources, and c) technical liability on remote consultations. The processing of the results is currently ongoing.

Discussion: The results are still being specified. From PCPs' perspective, remote consultations were perceived to change their work and cause new requirements for competencies and skills needed to succeed at work. The possibility of working remotely seemed to bring the participants more freedom and enabled them to cope better with demanding PCP work. However, working only remotely lack the societal aspect of the work community and could leave clinical work narrow. PCPs found that performing remote consultations require competencies in clinical experience and decision-making ability.

References:
1. Carrillo de Albornoz S, Sia KL, Harris A. The effectiveness of teleconsultations in primary care: systematic review. Fam Pract. 2022 Jan 19;39(1):168-182. doi: 10.1093/fampra/cmab077.
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O-3: Managing tensions and paradoxes between stakeholders in MyData health ecosystem

Fan Wang[1], PhD, Pasi Karppinen[2], PhD, Petri Ahokangas[1], PhD
[1]Martti Ahtisaari Institute, Oulu Business School, University of Oulu
[2]Oulu Advanced Research on Service and Information System, University of Oulu, Finland

Introduction: In the digital era, a large amount of health data has been documented, generated, and stored in clinical evaluation and daily life, but citizen-generated health data has yet to be combined, interoperated, analysed, and made available for professionals, citizens, research institutes, and companies for secondary use, e.g. for preventive and predictive health analysis and innovation purposes. To solve the problem, Finland attempts to build the MyData health ecosystem, which links multiple stakeholders to co-create health value and make it understandable for citizens through health data management and sharing [1,2]. During the process of engaging stakeholders in the ecosystem for continuous data sharing and co-creation between hospitals, companies, research institutes, and citizens. The co-creation of health value and delivery by different stakeholders will encounter tension and paradoxes, such as attitudes towards commercial use of personal health data, data stewardship, data sovereignty, and legal barriers. Therefore, this study investigates tensions and paradoxes perceived by the multiple stakeholders in the co-creation of health services through data with the MyData health ecosystem. Instead of attempting to forcefully merge the perspectives of all stakeholders, the paradoxes approach acknowledges and accepts the existence of contradictions and tensions. The key is to manage these contradictions effectively rather than seeking complete reconciliation. By doing so, it becomes possible to navigate the complex landscape while still addressing the concerns of various stakeholders.
Material and Methods: In order to explore the complex and dynamic phenomenon of tension and paradoxes within digital health ecosystems, the qualitative research method was selected with a case study approach to gain an understanding of complex phenomena by in-depth understanding and analysis [3]. Finland is an excellent country for healthcare innovations because it is highly digitalised and has wide wireless network coverage. Most of the health data in the country are available in digital format. However, Finland still urgently needs a cooperative to structure, integrate, and utilize these technological advantages together, as Finnish society is facing an aging population and needs a new model of healthcare reform. We conducted 30 semi-structured interviews with physicians, health technology companies' representatives, IT experts, policymakers, and citizens to broaden the understanding of the MyData platform from multiple stakeholders' viewpoints between November 2021 and February 2022 so that tension and paradoxes could be captured and managed. Two Business Finland funded digital health research projects aimed at health co-creation were utilized to understand tensions, paradoxes, conflicts, and competition, as well as the opportunities in the co-creation process involving multiple stakeholders as secondary data.
Results: The study identified tensions and paradoxes, highlighting several major concerns. Firstly, there is apprehension regarding companies potentially misusing human-centered data to further their commercial interests, potentially at the expense of others. Secondly, there are concerns surrounding the quality assurance and responsibility associated with self-reported data, particularly regarding its application in clinical settings. The third concern pertains to the legal barriers involved in integrating and transferring data among multiple stakeholders, as well as issues of cybersecurity and privacy. Lastly, there is a focus on the ownership, legitimacy, and accountability of MyData, which directly impacts public trust in effectively managing a complex data ecosystem. The study suggests that managing stakeholder tensions and paradoxes should emphasize: 1) foster shared value and social contribution to society. 2) establish trustworthiness of companies and emphasize their role in co-creating health value. 3) enhance the legitimacy of the entire ecosystem. To achieve these objectives, strategic communication among stakeholders should be prioritized, with a particular focus on promoting the value of health, empowerment, and social responsibility.
Discussion: The traditional healthcare model primarily focuses on the supply side to deliver value to end customers. In contrast, MyData health management solutions adopt a decentralized engagement platform model that involves multiple stakeholders in co-creating and delivering value for care. However, this approach encounters tensions and paradoxes, particularly concerning the secondary use of data. Therefore, it is crucial to consider human factors in order to ensure that the outcomes align with society's expectations regarding human-centric health data sharing and shared decision-making. By identifying and addressing the tensions and paradoxes within the MyData health ecosystem from the perspectives of various stakeholders, new opportunities arise to establish shared practices, goals, values, and accountability. Incorporating these considerations at an early stage ensures stakeholder engagement, transparency, and synergy. This practical approach will contribute to the design and implementation of the MyData health ecosystem within the Finnish health reform and system, facilitating its successful integration and operation.

References are available from the authors

Session 2B: Etäpalvelut käytännön työssä

Puheenjohtaja: Aleksi Schrey, Yliläääkäri, YTHS
Chair: Aleksi Schrey, Chief Medical officer, Finnish Student Health Service, YTHS

Thursday12th of October 2023

15:15 – 16:30

2B-1 Toteutuuko hoidon jatkuvuus

Juha Auvinen, Professori
Oulun yliopisto

2B-2 Eettisyys ja laatu

Riitta Luoto, ryhmäpäällikkö, yliläääkäri, tutkimusyksikkö
Kela

2B-3 Etävastaanoton parhaat käytännöt " Käypä" etävastaanotto

Aleksi Schrey, Digitaaliset palvelut, yliläääkäri Chief Medical Officer (Digital health)
Finnish Student Health Service, YTHS

5 min rapid scientific presentations

O-4: Tailored 3D Breast Models for Microwave Based Breast Tumor Monitoring/Detection Applications Scientific rapid presentation

Mariella Särestöniemi1,2, Dr.(Tech), Jarmo Reponen11,3, MD, Teemu Myllylä3,4Dr. (Tech)
[1]*Research Unit of Health Sciences and Technology, Faculty of Medicine, University of Oulu, Finland*
[2]*Centre for Wireless Communications, Faculty on Information Technology and Electrical Engineering, University of Oulu, Finland*
[3]*Medical Research Center Oulu (MRC Oulu), Oulu University Hospital and University of Oulu, Finland*
[4]*Optoelectronics and Measurements Techniques research unit, University of Oulu, Finland*

O-5: The use of digital occupational health services: Perspective of employer clients

Sari Nissinen, Sanna Pesonen, Pauliina Toivio, Erja Sormunen
[1]*Finnish Institute of Occupational Health*

O-6 Impact and user behaviour of digital service for headache in specialized care

Salla Strand, Louna Koponen, Hanna Harno, Laura Mäkitie
[1]*Centre for Wireless Communications – Networks and Systems, University of Oulu, Finland*

Toteutuuko hoidon jatkuvuus

Juha Auvinen, Professori
University of Oulu

Biography Juha Auvinen

Juha Auvinen, MD, PhD is a professor of general practice in University of Oulu and Wellbeing Services County of North Ostrobothnia. He is responsible for Medical education in the University of Oulu and director of Research Unit of Population Health. His research work is focused on clinical epidemiology, multimorbidity and continuity of care. He has also actively work with national guidelines and recommendations of primary health care models and general practice. He is a chair of the Finnish Association of General Practice and board member of the Nordic Federation of General Practice.

Eettisyys ja laatu

Riitta Luoto, MD, PhD, MBA, Medical director, Research
Kela

Biography Riitta Luoto

Riitta Luoto is a research and insurance professional currently working as medical director in research unit of Kela, Social Insurance Institute of Finland. Luoto is medical doctor (MD PhD), public health and occupational health specialist and MBA focusing on social welfare and healthcare reform. She also has finished Finnish Medical Association specialties health care technology and insurance medicine. In addition with Kela, Luoto has worked with public health research and management in University of Tampere (6 yrs), UKK Institute (12 yrs) and Finnish Institute for Health and Welfare (20 yrs). Publication record of Luoto includes 120 peer-reviewed international and over 100 Finnish articles, reports and other publications. Luoto's current research interests are related to effectiveness of occupational health services in health care reform and health-related social insurance issues.

Digital health includes electronic health (eHealth), advanced computer sciences ('big data' and artificial intelligence) and telehealth, telemedicine, and mobile health (mHealth). Telemedicine is, by the definition, the practice of medicine over a distance, in which interventions, diagnoses, therapeutic decisions, and subsequent treatment recommendations are based on patient data, documents and other information transmitted through telecommunication systems. This definition, also accepted by Finnish Medical Association, is wide and includes several aspects of ethics and quality. Clinicians utilizing telemedicine in their clinical work are responsible for quality and ethics.

Since telemedicine is based on information technology, security and privacy are the most important aspects to be studied. If the only viewpoints taken are of developing new technologies or promoting the industry, there may occur ethical problems. Patient-physician- relationship is the key concept in telemedicine and e-health. Due to this, telemedicine practice requires high ethical standards as in any clinical practice. According to World Medical Association (WMA) recommendations, the driving force behind digital health should be improving quality of care, patient safety and equity of access to services otherwise unavailable. There is a growing need to establish regulations including quality and ethics in telemedicine. Finnish authorities (STM) still consider telemedicine and ordinary physician encounters as equal. WMA recommendations for ethics of telemedicine include 6 aspects. Firstly, telemedicine should be appropriately adapted to local regulatory frameworks, which may include licensing of telemedicine platforms in the best interest of patients. Secondly, the practice of telemedicine should protect the patient-physician relationship, confidentiality, and quality of medical care. Thirdly, telemedicine should not be viewed as equal to face-to-face healthcare and should not be introduced solely to cut costs or increase earnings for physicians. Use of telemedicine may have adverse consequences on collegial relationships and referral patterns, which need to be discussed. New guidelines and standards covering telemedicine in routine care are needed. Finally, ethical telemedicine practices should serve especially patient's interests, not providers only. Before pandemics there were doubts concerning patient experiences in telemedicine. There are still doubts over quality assurance in the field of telemedicine. Quality aspects include patient interests, availability of services, safety, efficacy and effectiveness and medical quality. According to a review covering a decade of studies on ethics in telemedicine, most important finding was gap in patient interaction with his/her data and the use of that data. Further research findings are discussed in the lecture.

References: References are available from the author

Etävastaanoton parhaat käytännöt " Käypä" etävastaanotto

Aleksi Schrey, Digitaaliset palvelut, ylilääkäri Chief Medical Officer (Digital health)
Finnish Student Health Service, YTHS

Biography Aleksi Schrey

Aleksi Schrey toimii Ylioppilaiden terveydenhoitosäätiössä (YTHS) digitaalisten palvelujen ylilääkärinä, tietosuojavastaavana ja potilastietojärjestelmän vastaavana lääkärinä. YTHS:ssä hoidetaan yli 60 % opiskelijoiden reilusta puolesta miljoonasta vuosittaisesta käynnistä etäyhteyksiä hyödyntäen. Terveydenhuollon tietotekniikan erityispätevyys 2022. STeHS hallituksen jäsen vuodesta 2022.
Digitaalisista palveluista kiinnostunut osana monikanavaista palvelua. Osa asioista voidaan hoitaa etänä myös ensikontaktissa, osa asioista kaipaa hoidon jatkuvuutta vaikuttavuuden parantamiseksi. Digital tools and services provided efficiently with high quality as will be an essential part of multichannel services fulfilling further demands required by the health care sector and legislation. Presentation gives practical hints and tips for remote appointments and is part of the session focusing on quality and continuity of the treatment provided digitally.

Clinically appropriate digital tools and services provided efficiently with high quality are essential as part of multichannel health care services fulfilling further demands required by the health care sector and legislation. Patient safety must be considered as well as data protection and security. The individual assessment is required concerning the appropriateness of each case for telemedicine services [1],[2]

Presentation gives practical hints and tips for remote appointments and is part of the session focusing on quality and continuity of the treatment provided digitally.

References can be used:
[1] Suomen Lääkäriliitto (2022) Etälääketieteen suositus. [in Finnish] https://www.laakariliitto.fi/laakarin-tietopankki/kuinka-toimin-laakarina/etalaaketieteen-suositus/ [accessed 25.8.2023].
[2] Valvira (2022) Telemedicine services. https://www.valvira.fi/web/en/healthcare/private-health-care-licences/telemedicine-services [accessed 25.8.2023].

O-4: Tailored 3D Breast Models for Microwave Based Breast Tumor Monitoring/Detection Applications Scientific rapid presentation

Mariella Särestöniemi[1,2], Dr. (Tech), Jarmo Reponen[1,3], MD, Teemu Myllylä[3,4] Dr. (Tech)
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[2] Centre for Wireless Communications, Faculty of Information Technology and Electrical Engineering, University of Oulu, Finland
[3] Medical Research Center Oulu (MRC Oulu), Oulu University Hospital and University of Oulu, Finland
[4] Optoelectronics and Measurements Techniques research unit, University of Oulu, Finland

Introduction: Introduction: Portable breast health monitoring devices, which could be used also in rural areas or for self-monitoring of risk group, are considered as promising eHealth applications for future's telemedicine. Microwave technology in breast cancer detection has been studied actively in recent years [1]-[3]. This technology is based on analyzing radio channel responses between multiple antennas placed around the breast. The authors have previously proposed a breast monitoring vest with embedded flexible antennas in [2] and its proof-of-concept was evaluated with realistic phantoms in [3]. Comprehensive reference data banks including different breast density categories, as shown in Fig.1a [4], are essential for channel analysis process to avoid false alarms. Reference data banks could be developed using realistic 3D breast models which can be adjusted for different breast densities. This paper presents simulation -based channel evaluations for breast tumor detection using breast models developed for different breast densities.

Material and Methods: Simulations are conducted with an electromagnetic simulation software CST in which three adjustable breast models are developed for different breast density categories as shown in Fig.1b. In the first model a) fatty, the core tissue, depicted as FG in the simulation model, is fat without larger lobules. The second model is b) scattered fibroglandular in which the core tissue is fat with few lobules. The third model is dense in which core tissue FG is fully glandular tissue. The microwave technique is based on evaluating radio channel between the on-body antennas in the presence and absence of tumor. In this case, the tumor size is 1cm. The physical phenomenon behind the technique is that the dielectric properties of tumors differ from the dielectric properties of glandular tissue and fat tissue. Thus, abnormalities can be detected from the radio channel between the flexible antennas located around the breast tissue, using intelligent radio channel analysis [2].

Results: Figs.1c) presents channel parameter S21obtained using different breast density models in the presence and absence of breast tumors between the closest antennas 1 and 2. It is found that breast density effects on the channel characteristics: the denser the breast, the more challenging is the tumor detection with the selected antenna combination. However, in all the cases, the channel attenuation is consistently at lower in the reference case than in the tumor case at the frequency range 3.75-6 GHz. Channel attenuation levels at lower frequencies could provide information of breast density category of the measured person.

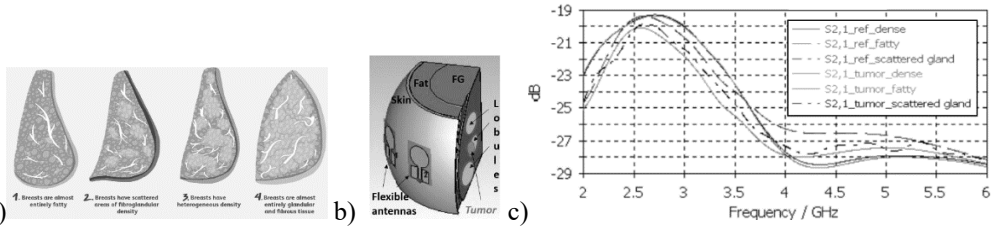

Fig. a) breast density categories, b) simulation model for different breast density category options, c) simulated S21 parameters with and without tumors.

Discussion: The monitoring vest could have remarkable potential for conducting breast cancer screening e.g., in smaller healthcare centers in rural areas and as user-friendly home monitoring device for risk groups. The results shown in this paper prove the necessity of developing comprehensive reference data banks using breast models with different breast density categories since tissue constitution affects clearly on detectability of tumors. In general, such tailored 3D-models could serve as digital twins for different breast study applications. Especially, they would be useful for a tailored breast tumor self-monitoring vest.

References:

References are available from the authors

O-5: The use of digital occupational health services: Perspective of employer clients

Sari Nissinen[1] PhD, Sanna Pesonen[1] M.Sc, Pauliina Toivio[1] M.Sc, Erja Sormunen[1,] PhD
[1]Finnish Institute of Occupational Health

Introduction:
The occupational health (OH) cooperation is an interactive and jointly agreed activity between the workplace and OH professionals, guided by the principles of awareness (providing information on work ability, health status, work-related risks, and workload), preparation (implementing preventive measures to support work ability), and participation (exploring options for continued work). [1] To facilitate this cooperation, OH providers have developed digital services for employer clients [2], aiming to streamline collaboration, improve its quality, and enhance information exchange and reporting. [3-5] However, research on digital OH services remain limited.

Material and Methods:
The aim of this descriptive study [6] was to find out which digital OH services offered to employer clients are used. Additionally, we sought to examine the perceptions of these digital OH services among entrepreneurs and HR professionals. The research data was collected through an e-mail questionnaire sent to members of a Finnish entrepreneur association and a human resource (HR) management association between May and June 2021. The results were presented as quantities and percentages. Differences between respondent groups were analysed using the chi-square test. Statistical significance was defined as $p<0.05$.

Results:
A total of 455 participants took part in the study, comprising 257 entrepreneurs and 198 HR professionals. Most of the respondents were women (65.5%) and over 50 years old (61.2%). Nearly half of the participants had workplaces with no more than 10 employees. When evaluating their information and technology skills, three-quarters of the respondents rated them as good (75.7%). The findings indicated that the most frequently utilized digital OH services were the ability to update personal information in the OH patient registry (48%) and remote action plan negotiations (37.1%). The results also revealed that less than one-third of the respondents (29.9%) took part in remote work ability negotiations, while approximately one-fifth (20.8%) participated in workplace surveys. Additionally, slightly over a quarter of the respondents (26.7%) had utilized the sick leave notification system, and slightly less than a quarter (23.7%) had used a monitoring system for work ability risks. Respondents were also asked to share their opinions on digital OH services in general. Most respondents found the use of digital OH services to be easy (61.52%) and easy to learn (62.9%). Furthermore, more than half of the participants considered digital services to be flexible (59.7%) and clear to use (53.0%), and they agreed that these services helped them receive the necessary support from OH professionals (57.3%). However, less than half of the respondents believed that digital services could enhance the quality of the service (41.9%), and a similar proportion reported difficulties in finding instructions for using digital OH services (40.9%). In addition, respondents were asked to rate digital OH services, and the average grade received was 8.04 on a scale of 4 to 10. There were statistically significant differences between the entrepreneurs and HR professional's respondent groups.

Discussion:
This descriptive study presents a picture of employer clients' use of digital OH services. According to the results, quite a lot of respondents found digital OH services easy to use and flexible. However, it is noteworthy that there were many respondents who felt that their ICT skills were not good and that they had difficulties in finding instructions for using digital OH services. Moreover, there were differences between respondents: HR professionals utilized the digital OH services more frequently and were also more positive than entrepreneurs. The findings highlight the importance of understanding these differences to optimize the delivery and effectiveness of digital OH services for all employer clients, especially when it has been observed that entrepreneurs are often unaware of OH services and might not fully commit to OH cooperation. [7]

References:
References are available from the authors

O-6: Impact and user behaviour of digital service for headache in specialized care

Saila Strand, RN, Louna Koponen, RN, Hanna Harno, MD, PhD, Laura Mäkitie, PhD, MD
Neurology, Neurocenter, Helsinki University Hospital, Helsinki, Finland

Introduction: AIntroduction: In neurology outpatient clinics, persons with chronic headaches form one of the biggest patient groups. The treatment is based on medication, even though the education on lifestyle factors and non-pharmacological treatment methods (physiotherapeutic and psychological) are proven efficient1. This is due to unfamiliarity with these methods and limited resources to apply them. To include these treatments and increase the quality of care, HUS Neurocenter has developed a digital care service for patients with chronic headache. The service includes education on safe and efficient use of medication, lifestyle factors triggering headaches, psychological and physiotherapeutic treatment methods, and support for starting physical exercise. In addition, a mobile headache diary is used for the follow-up of the treatment results, and secured chat with headache nurse and a videoappointment are available. The service is operated on Health Village's MyPath platform and it's free of use for the patients for eight months.

Material and Methods: Population: Persons with chronic or nearly chronic headaches, a care-relation to Helsinki University Hospital (HUS) neurology. All patients are adults and have sufficient skills in Finnish to operate in the service. The service is opened by a doctor or a nurse upon the willingness and suitability of the patient for the service. Intervention: Digitalized psychoeducational and rehabilitating service providing non-pharmacological treatments and mobile headache diary. User behavior indicators are collected from PowerBI reports (Microsoft) on MyPath® service. User experiences and satisfaction are collected by automated feedback channels and interviews in master theses for applied sciences. Descriptive statistical values are calculated with Excel (Microsoft). Impact of the service is evaluated by comparing the resource demands for performing the same actions face-to-face by health care professionals providing the services.

Results: The digital service was launched in the beginning of 2019. The annual growth in users has been between 0 – 88 %, the highest growth detected from 2021 to 2022 indicating that the full potential of the service has not been reached in four years. The proportion of patients active in using the service (registered and logged in) has increased from the first year until third year from 29 % to 83 %, and the plateau seems to be reached. After two years' experience on use, the service has been copied to four other outpatient clinics of neurology on the same HUS area scaling the service available for nearly 3000 patients annually compared to original 1400 patients.

The average of logins to the service is 7,7 times per patient. Service is used actively during the first month during which 24 % of the logins happen. However, the engagement stays fairly good during the eight-month service since 43 % of logins are detected during the first 4 months and rest in the second half of availability. 62 % of the patients start using the headache diary and report in average 51 headaches during the follow-up.

Users of the digital service are not active in giving feedback. E.g., net promotor scale is available, but only 29 patients have given responses in four years. Much more beneficial for further development purposes have been a thesis project for applied sciences2 and oral feedback from patients directly to professionals in neurology outpatient clinic. The major updates to the service have been 1) the removal of hard-stops and delayed progression, 2) simplification of the content to subdivisions and 3) more emphatic and approving tone in the content.

It has been estimated by professionals in neurology outpatient clinic that the content in digital care pathway equals for two sessions with a headache specialized nurse and a psychologist and one session with physiotherapist. Prior to the launching of the digital service, these resources were not available for any patients to this extent. The service contains rehearsals and self-engaging questionnaires to empower patients to take more responsibility of their care and well-being. The digital service is available for the patients whenever they have a chance or motivation to use it.

Discussion: Digitalization is expected to help solving the problem of steadily increasing expenses of health care and the lack of professionals. However, the benefits come by successful implementation, not by technology itself. To our experience, monitoring the user behavior helps scaling up the solutions, and gather of user satisfaction and feedback direct improving the service and increase the adherence to the service. The efficiency comes by the change of care processes and utilization of the full potential of digital solutions. Thus, the implementation needs to be carefully planned, results patiently waited and post-market development performed.

References: References are available from the authors

Sessio 3A: Diversity of AI

Puheenjohtaja: Jarmo Reponen, Professor, University of Oulu

Chair: Jarmo Reponen, Professor, University of Oulu

Torstai 12.10.2023 - Thrusday 12th of October 2023

17:00 – 18:30

3A-1 Human rights and biomedicine–the impact of AI on the doctor-patient relationship
Lee Hibbard, Human Rights and Biomedicine Division, Directorate General – Human Rights and Rule of Law
Council of Europe

3A-2 AI in Health Care Education
Mikko Myllymäki, Senior lecturer
Savonia University of Applied sciences

3A-3 How AI is supporting Health Professionals in Radiology?
Jussi Hirvonen, Professor, Clinical Medicine
Tampere University

3A-4 Data interoperability and data models for clinical information sharing
Peeter Ross, MD, Ph.D., professor of e-health and the head of eMedLab of Tallinn
University of Technology (TalTech), Estonia

5 min rapid scientific presentations

O-7 Remote monitoring and predictive machine learning models in Parkinson's disease
Laura Mäkitie, Maija Koivu, Veera Itälinna, Joonas Niskala, Eleonora Fiorenza, Luca Weis
[1]*Electrical Engineering Unit, Tampere University, Finland*

O-8 An interactive web-based family intervention to promote cardiovascular health after preeclampsia (FINNCARE-study)
Anni Kivelä, Michelle Renlund, Seppo Heinonen, Minna Aittasalo, Taisto Sarkola, Hannele Laivuori, Tiina Jääskeläinen
[1]*Centre for Wireless Communications, University of Oulu, Finland*
[2]*Department of Sciences and Technology, University of Camerino, Italy*
[3]*Opto-electronics and Measurements Technique, University of Oulu, Finland*

Human rights and biomedicine – the impact of AI on the doctor-patient relationship

Lee Hibbard, Human Rights and Biomedicine Division, Directorate General – Human Rights and Rule of Law
Council of Europe

Biography Lee Hibbard

Lee Hibbard works in the Human Rights and Biomedicine Division, and is currently responsible for inter alia reports on AI and healthcare, the Youth Forum on Bioethics, and a Guide to health literacy for equitable access to healthcare. Until 2018, Lee was the Council of Europe's internet governance co-ordinator responsible for the development of the Internet governance strategy (2012-2015) and the Internet governance strategy (2016-2019). This included the establishment of a partnership with digital companies and the development of several policy documents that were adopted by member states, including the Recommendation on the guide to human rights for Internet users (2014), Declaration on digital tracking and surveillance (2013), Recommendation on social networking services (2012), Recommendation on search engines (2012), and Declaration on Internet governance principles (2011).

AI in Health Care Education

Mikko Myllymäki, Senior lecturer
Savonia University of Applied sciences

Biography Mikko Myllymäki

Mikko Myllymäki, MSc, currently serves as the Development Manager at Savonia University of Applied Sciences. His career started with over 10 years of intensive care nursing, which informs his work in nursing education. Mikko served as a Senior Lecturer at Savonia for five years before assuming his current role. His specialty is digital pedagogy solutions, with a particular emphasis on the use of virtual reality. As a forward-thinking professional, Mikko regularly shares his visions for the future of healthcare education. His interest in artificial intelligence has led him to explore its potential for higher education, and he has become an active advocate for AI-powered healthcare education.

How AI is supporting Health Professionals in Radiology?

Jussi Hirvonen, Professor, Clinical Medicine
Tampere University

Biography Jussi Hirvonen

I currently serve as a Professor of Radiology at Tampere University, Finland, and as a neuroradiologist and head & neck radiologist at Turku University Hospital, Finland. I received my MD and PhD degrees from the University of Turku, Finland, and completed a postdoctoral fellowship on molecular brain imaging at the National Institutes of Health, MD, USA. I have completed European Diplomas in Neuroradiology (EDiNR) and Head and Neck Radiology (EBiHNR). My research interests relate to advanced MRI techniques in head and neck radiology, emergency radiology, artificial intelligence, and neuropsychiatric brain imaging.

Artificial intelligence (AI) applications are rapidly evolving and transforming the field of medical imaging. The applications and possibilities seem endless, ranging from assisted patient positioning and improved image acquisition and reconstruction to pattern recognition and image interpretation. Deep learning refers to the use of AI algorithms that employ artificial neural networks to achieve complex goals, such as speech recognition and classification of images. In radiological image analysis, deep learning is typically used to recognize, classify, or segment abnormal findings in images. These methods are now being used in exponentially increasing numbers in radiological research, mostly due to the availability of large datasets, pretrained artificial neural networks, and affordable parallel computing. As a result of this rapid development, AI algorithms are now surpassing human-level performance in narrowly defined tasks, such as finding malignant lesions in mammography. These methods are expected to increase the productivity of radiologists, although not fully replace the radiologist as the medical information specialist.

Data interoperability and data models for clinical information sharing

Peeter Ross, MD, Ph.D., professor of e-health and the head of eMedLab of Tallinn
University of Technology (TalTech), Estonia

Biografia Peeter Ross

Peeter Ross, MD, Ph.D., is a professor of e-health and the head of eMedLab of Tallinn University of Technology (TalTech), Estonia. Dr. Ross has previously been a member of the Supervisory Board of the Estonian E-Health Foundation and Estonian Health Insurance Fund. Peeter has advised on the design and implementation of large-scale e-health projects in more than 20 countries around the world and has been involved in several EU-funded healthcare innovation projects. He has actively participated in designing and implementing the Estonian nationwide Health Information System. His areas of expertise are health care and social care policy implementation, innovation and use of digital applications in the health domain, and the use of e-services in diagnostic and treatment processes in health care.

Along with the introduction of Electronic Medical Records (EMRs) and Electronic Health Records (EHRs) that combine the data collected in them, clinical activities have changed more and more in the direction that one of the central elements in making diagnostic and treatment decisions is the digital data collected in different healthcare institutions. Estonia, together with the Nordic countries, is one of the most advanced countries in sharing patient data through the nationwide Digital Health Platform (DHP). This is also illustrated by the high frequency of online queries made by nurses and doctors as well as by natural persons to the DHP. Although digital data and information sharing between healthcare professionals and between healthcare professionals and natural persons have a positive impact on different aspects of care quality, the ever-increasing amount of data and information creates new challenges for the development of digital applications, tools, and systems. The existence of a large amount of health data gives reason to assume that modern text and data processing tools are used extensively in healthcare. However, this trend in real life is surprisingly slow, and Digital Decision Support Systems (DDSS) or other digital tools supported by artificial intelligence (AI) methods are rarely used. One of the main barriers to the re-use of captured data is that the quality of this data is often questioned, and digital data are often missing standards and structures that are a prerequisite of interoperability.

This presentation discusses the frequency of the use and quality of health data stored in the Estonian nationwide EHR, which is a core structure of one of the most advanced DHPs in the world, and what are the opportunities and barriers of applying modern AI tools in top of the system, among of others the implementation of clustered association rule mining to find comorbidities and indicator diseases for patients with mental disorders. Also, the options for how to overcome the low adoption rates of DDSSs are addressed. The presentation proposes a systematic strategy for bringing DDSS research into clinical practice and transforming healthcare to be more innovative, patient-centric, accurate, and efficient.

In conclusion, while humans seem to be able to screen the data and resolve inconsistencies effectively, the data quality issues present make data reuse for tasks like AI training for digital decision support systems challenging. For more widespread use of an AI-powered applications in healthcare, the focus must be on the common use of internationally adapted data models, data standards, and data structures.

O-7: Remote monitoring and predictive machine learning models in Parkinson's disease

Laura Mäkitie[1], MD, PhD, Maija Koivu[1], MD, Veera Itälinna, M. Sci[2], Joonas Niskala[1], RN, Eleonora Fiorenzato[3], PhD, Luca Weis[3], PhD
[1]Neurology, Neurocenter, Helsinki University Hospital, Helsinki, Finland
[2]AI applications and analytics, IT Management, Helsinki University Hospital, Helsinki, Finland
[3]Parkinson's Disease and Movement Disorders Unit, Department of Neuroscience, Centre for Rare Neurological Diseases (ERN-RND), University of Padova, Padova, Italy

Background: The number of people having chronic disease like Parkinson's disease (PD) is increasing. The follow-up of these diseases bounds globally numerous health care professionals since clinical evaluation and the adjustment of treatment plan are performed at outpatient visits in the hospitals. As PD progresses to advanced stage, persons with Parkinson's disease (PwPs) will become dependent on others and the quality of life will decrease. At this point, device-aided treatments and multidisciplinary care can maintain independent living, quality of life (QoL) and lessen the burden of caregivers. Heterogeneity of the symptoms provokes a challenge for clinical assessment and generates a demand for home-based monitoring with digital biosensors as compared to the short evaluation at doctor's appointment1. Accumulating data can be analyzed by algorithms thus giving the clinicians predictions of the disease progression2.

Aims: Helsinki University Hospital (HUS) is leading an international AICCELERATE-consortium of five European hospitals, seven technology companies and three non-profit organizations, which has received €10 million funding from EU's Horizon2020 program (https://aiccelerate.eu/). The aim of the AICCELERATE project is to develop a Smart Hospital Care Pathway (SHCP) Engine that serves as a toolset of artificial intelligence (AI) -enabled solutions for hospitals including robotics, 3D modelling of hospital workflows, AI and machine learning models and process optimization. The SHCP engine can be integrated to different platforms, and the input data can be collected from different sources and with different devices, depending on the users' preferences. The SHCP Engine will be developed in three clinical pilots: (i) patient flow management for ER and surgical units, (ii) digital care pathway for Parkinson's disease, and (iii) pediatric service delivery.

In the PD pilot of AICCELERATE, the aim is to develop AI-algorithms for predicting PD transition to advanced stage and to dementia. The input data for algorithms are obtained from remote monitoring devices and applications used by patients in their everyday life, and clinical registries from HUS and University of Padua, Italy (UNIPD).

Results: Cohort specifications were diagnosis of PD verified by a neurologist and no atypical Parkinsonism. With fulfillment of these criteria, retrospective data of 5824 patients from HUS and 1013 patients from UNIPD were collected. Female: male ratios of data sets are 56 % and 60 % in HUS and UNIPD, and average ages are 77 [17-107] and 72 [49-90], respectively. Outcome variables used for labels in algorithm development should appear sufficiently in data sets: for advanced disease 1771 (30% of the cohort) in HUS, and 222 (22%) in UNIPD, and for dementia 1049 (18%) and 141 (14%), HUS and UNIPD, respectively.

Data integration suite for conversion of input variables to common data model is developed by SRDC (Turkey) in co-operation with clinical partners. Data integration suite includes also mapping definitions. Common data model constitutes of Fast Healthcare Interoperability Resources (FHIR) profile definitions for features. Data integration suite and model are open source for others to utilize (https://github.com/aiccelerate). All together 155 clinical variables are defined as features and included in the data model.

Devices and applications chosen for remote monitoring include AI-enhanced motion capture and symptom diary (NeuroPath), Ignite2 wearable (Polar), Cognitive assessment app (UNIPD), medicine dispenser robot (Evondos), and MyPath digital service (HUS). With these devices motor, non-motor and cognitive symptoms will be detected for one year in prospective cohort of PDs comprising of 200 PwPs from HUS and UNIPD. Permissions form HUS ethical committee and Finnish Medical Agency (FIMEA) are acquired. Patient and neurologists opinions and preferences on the use of AI and remote monitoring are studied3.
Discussion/what is happening next: 1. Data preprocessing for algorithm development, 2. Algorithm development and testing, after which showing of technical validity, 3. Patient recruitment for prospective study and collection of remote monitoring data. Research activities provide information on clinical validity of remote monitoring and algorithms.
References: References are available from the authors

O-8 An interactive web-based family intervention to promote cardiovascular health after preeclampsia (FINNCARE-study)

Anni Kivelä[1], Michelle Renlund[2,3], Seppo Heinonen[4], Minna Aittasalo[5], Taisto Sarkola[2,3], Hannele Laivuori[1,6,7], Tiina Jääskeläinen[1,8]
[1]Medical and Clinical Genetics, University of Helsinki and Helsinki University Hospital, Helsinki, Finland
[2]Children's Hospital, University of Helsinki and Helsinki University Hospital, Helsinki, Finland
[3]Minerva Foundation Institute for Medical Research, Helsinki, Finland
[4]Department of Obstetrics and Gynecology, Helsinki University Hospital, Helsinki, Finland
[5]UKK Institute for Health Promotion Research, Tampere, Finland
[6]Institute for Molecular Medicine Finland (FIMM), Helsinki Institute of Life Science, University of Helsinki, Helsinki, Finland
[7]Department of Obstetrics and Gynecology, Tampere University Hospital and Tampere University, Faculty of Medicine and Health Technology, Tampere Center for Child, Adolescent, and Maternal Health Research, Tampere, Finland
[8]Department of Food and Nutrition, University of Helsinki, Helsinki, Finland

Background: Strategies to prevent cardiovascular disease in women are needed as cardiovascular disease is the leading cause of death among women worldwide remaining stable during recent decades. Pre-eclampsia is a pregnancy-related hypertensive disorder affecting 2–3% of pregnancies in Finland. The prevalence is likely to increase due to incresing obesity and age at delivery. Pre-eclampsia is related with early development of hypertension and cardiovascular disease in both mothers and their children [1]. Digital health offers low-cost and easy-to-scale intervention approaches for cardiovascular prevention, but the evidence of their effectiveness and feasibility in reducing blood pressure and the cardiovascular risk profile overall is still scarce.
Aim and implementation of the project: A randomized controlled trial was conducted to evaluate the effectiveness and feasibility of a 12-month interactive web-based intervention to reduce previously pre-eclamptic mothers' and their children's systolic blood pressure and cardiovascular risk profile overall [2]. Families in the Helsinki Uusimaa district from the FINNPEC study cohort were prospectively recruited 8–12 years from index pregnancy. An interactive web-based portal was developed for the intervention (HowSpace platform by Humap Software Ltd.). The intervention covered five target behaviors to reduce cardiovascular risk: improving the quality of fat in the diet, increasing the consumption of foods rich in fiber, decreasing the use of salt, increasing physical activity, and reducing smoking. HulaHula application (Sunday Morning Solutions Ltd.) was used to promote physical activity. In the intervention, new lifestyle-related themes were introduced every 1-2 weeks combined with individual counseling and feedback from a nutritionist. Different modules to modify target behaviors included assignments, activities, tests, and videos. Most tasks were completed together as a family but materials and tasks were also designed separately for parents and children.
Anticipated results: During 2019-2023 110 families participated in the intervention and 82 families were included as controls. We also included a parallel non-PE group. Process evaluation of the intervention includes reach, compliance and acceptability. The data is collected from Howspace platform, which utilizes artificial intelligence and provides information on e.g. how the families use the web-based platform, number of logins, time spent in the portal, proportion of sessions completed, and most interesting themes. Effectiveness is evaluated with changes in cardiovascular health, diet, physical activity, and smoking status. Families have given positive encouraging feedback of the lifestyle intervention. Analyzing the results will start in autum 2023.
Discussion/what is happening next: The study will generate novel information on the effectiveness and feasibility of an interactive web-based lifestyle intervention aiming to reduce cardiovascular risk in previously pre-eclamptic women and their children. If proven effective and feasible, the intervention could be scaled up to Finnish maternity and child health primary health care clinics and thus cover the whole pre-eclampsia population in Finland. Possibilities to further implement and test the intervention in the primary health care setting will be evaluated.

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Session 3B: Digitaaliset palvelupolut

Chair: Liisa Klemola, Lecturer, Savonia University of Applied Sciences

Thursday 12th of October 2023

17:00 – 18:30

3B-1 Kansalliset digitaaliset palvelut

Jaana Kotila, kehittämispäällikkö
Leena Soininen, Lääketieteellinen johtaja, Chief Medical Officer
HUS/DigiFinland

3B-2 Digitaalinen palvelupolku osana hyvinvointialueen monikanavaista palvelua

Merja Tepponen, Terveystieteiden tohtori
Lappeenranta

3B-3 Terveyskylän digipolku osana uniapneapotilaiden palvelupolkua

Jari Haverinen, erikoissuunnittelija FinCCHTA
Pohjois-Pohjanmaan hyvinvointialue

3B-4 Tutkimus mielenterveyden hoitopoluista työterveyshuollossa koneoppimismenetelmiä hyödyntäen

Pekka Varje, Tutkimuspäällikkö
Työterveyslaitos

5 min rapid scientific presentations

O-9 Telephone Consultation as a sustainable method of service delivery in occupational medicine: results of a qualitative study

Abigail O'Reilly, Conor Loftus, Hemal Thakore
[1]*Hamk University of applied sciences, Hamk Smart research unit, Hämeenlinna, Finland*
[2]*Laurea University of applied sciences, Digital Unit, Espoo, Finland*

O-10 Healthcare professionals' digital health competence profiles and associated factors; a cross-sectional study

Erika Jarva, Anne Oikarinen, Janicke Andersson, Kristina Mikkonen
[1]*Research unit of Nursing Science and Health Management, University of Oulu, Oulu Finland*
[2]*Center for Research on Welfare, Health and Sports, Academy of Health and Welfare, Halmstad University, Halmstad Sweden*

O-11 The extent and impact of digital services in healthcare and social welfare - An umbrella review

Sanna Lakoma[1], Henna Härkönen[2], Anastasiya Verho[1], Paulus Torkki[1], Riikka-Leena Leskelä[3], Paula Pennanen[3], Elina Laukka[3], Miia Jansson[2]
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O-12 HEI co-creating a service ecosystem for supporting digitalization in health and welfare

Hannu Tikkanen,1 DSc, Outi Ahonen,1 DSc, Ruusa Ligthart,1 DSc, Anna Salmi,1, MA, Doctoral Candidate
[1] *Laurea University of Applied Sciences*

Kansalliset digitaaliset palvelut

Jaana Kotila, Development Manager at Helsinki University Hospital (HUS)
Leena Soininen, Chief Medical Officer at DigiFinland
HUS/DigiFinland

Biography Jaana Kotila and Leena Soininen

Jaana Kotila, RN, MNsc, a Development Manager at Helsinki University Hospital. I am an experienced developer and educator in the area of Nursing, digitalisation, lean management and nurses' professional interventions. I have also taken part in developing advance practice model in Finland. I have published numerous articles in professional journals and several conference's abstracts. I am currently a Board Member of Finnish Nurses Association.

Leena Soininen works as Chief Medical Officer and head of business unit (digital services) in DigiFinland Oy, which develops, maintains and provides national digital services that improve the productivity and effectiveness of healthcare and social welfare services, rescue services and other sectors. Our flagship service is Omaolo, which is an CE-marked electronic service channel for social welfare, health care and oral health care, which supports self-service in personal care and directs the patient to appropriate assistance if necessary. My personal background is in intensive care and in Helsinki University hospital, where I completed my PhD and got my specialist license.

The development and implementation of nationwide digital services play a pivotal role in promoting equal access to social and health services for individuals. In a country of 5.6 million inhabitants, it is often worth to do things once for all, not build an almost similar service 21 times for each wellbeing service county. In this abstract, we describe the significance of Health Village, Omaolo, 116 117, Omasuuntima and Omaperhe -services in establishing a standardized and comprehensive framework for digital services across a nation. All these services have been funded by the Finnish government.

Terveyskylä, Health Village serves as a centralized platform, offering reliable and user-friendly health-related information and guidance. Furthermore, Health Village was launched in 2015 and is a collaboration between several Finnish healthcare organizations and healthcare experts. The main goal of Health Village is to provide reliable, evidence-based information and support to patients, their families, and healthcare professionals. The platform offers a variety of services and resources, including virtual care, educational materials, self-assessment tools, and peer support communities. Educational resources include articles, videos, and interactive modules that cover a wide range of conditions, treatments, and preventive measures. Overall, Health Village empowers individuals to become active participants in their healthcare journey by providing them with reliable information, virtual care options, and a supportive community. By summer 2023 there is 10 wellbeing services counties using Health Village. Omaolo is a national online service for social welfare and health care used through Omaolo.fi website. Omaolo supports self-care and helps people to contact public health care professionals if necessary. Omaolo is a medical device with MDR-CE marking and symptom checkers use medical knowledge compiled from care guidelines, systematic reviews, and reliable original research. Omaolo is used all over Finland and is currently supported by 17 wellbeing service counties. Medical helpline 116117 is a 24-hour service targeted at urgent health problems. Medical Helpline 116117 is currently a telephone service. In the future, the wellbeing services counties will offer chat and remote reception services in addition to the telephone service. The service is available everywhere in Finland, apart from Lapland and Åland. The service covers 97% of all Finns. Omasuuntima is a social and health care digital service for segmenting customerships. Based on the customership, Omasuuntima guides the client and the professional to choose the most suitable path and services for the client. Omasuuntima is recently launched and is currently used in 3 wellbeing service counties.

Omaperhe is the first service launched from an electronic family platform, which brings together in services intended for families with children. It is divided into three digital services: Omaperhe for persons with a family and persons who are starting a family, Helpperi (to be launched in Q4/2023) for young people and in 2024 a dedicated service for professionals. Omaperhe is currently used in 7 wellbeing service counties.

In conclusion, the development and implementation of national digital services, including Health Village, Omaolo, 116 117, Omasuuntima and Omaperhe, contribute to the establishment of a standardized and inclusive framework for social and health services. These initiatives foster equitable access to digital resources, thereby eliminating disparities and ensuring that all individuals, regardless of their community, can benefit from the same level of care and support.

Digitaalinen palvelupolku osana hyvinvointialueen monikanavaista palvelua

Merja Tepponen, Terveystieteiden tohtori
Lappeenranta

Biography Merja Tepponen

Merja Tepponen currently works as a Social and Health Care Development Specialist. Previously she has worked as Chief Development Officer in South Karelia Social and Health Care District (Eksote) and Wellbeing services county of South Karelia until she retired in the summer of 2023.
Previosly she is responsible for management portfolio of Eksote's strategic development projects and she was responsible too for the implementation of the health and social services reform in South Karelia. The health and social services reform will restructure the organisation of public healthcare and social welfare in Finland. Rescue services will also be restructured as part of the reform. After the reform, there will be 21 new wellbeing services counties in Finland. In addition, the City of Helsinki will organise its own health, social and rescue services. Wellbeing services county of South Karelia is one of these wellbeing services counties. The wellbeing services counties is responsibility for organising services and they started operating on 1 January 2023.
Before that she has worked as a Director of Elderly Services (Social and health care) in city of Lappeenranta and Eksote. In 2016 – 2018 she has worked part time as an Agent of Change in Government Key Project: "Home care for older people will be developed and informal care enhanced in all age groups". The work of the agents of change will result in a written action plan approved by the regional stakeholders. The action plan lays down how the services for older people will be integrated in the county.
Dr. Tepponen has specialized in the management and intensive development of services for the elderly. His dissertation focused on the integration and quality of home care for the elderly. She has planned, led and managed several large development projects as well as confidential positions as a member of various advisory boards and steering groups. She has been involved in writing various articles that have focused especially on themes such as the development of care for the elderly and the integration of social and health care.

Terveyskylän digipolku osana uniapneapotilaiden palvelupolkua

Jari Haverinen, erikoissuunnittelija FinCCHTA
Pohjois-Pohjanmaan hyvinvointialue

Biography Jari Haverinen

Jari Haverinen, received his M.Sc. in Electrical Engineering (1999) and M.H.Sc. (2018) degrees from the University of Oulu, Finland. He has 18 years background in the telecoms industry before his career in digital health field. His current job role is Senior Planning Officer in the Finnish Coordinating Center for Health Technology Assessment (FinCCHTA). His main responsibility in FinCCHTA is the Digi-HTA assessment process that has been developed to perform health technology assessments (HTA) for novel digital healthcare technologies such as mobile apps, AI and robotics. He is also a Doctoral researcher at the Faculty of Medicine of the University of Oulu, where his research area is the development of new HTA methods for digital health solutions as well as eHealth research.

Digital Care Pathway of the Health Village as Part of the Service Path for Sleep Apnea Patients

Introduction: Continuous positive airway pressure (CPAP) therapy is the first-line treatment for moderate or severe sleep apnea. As of November 18, 2019, Oulu University Hospital has introduced a sleep apnea digital care pathway (DCP) as part of the Health Village service to which all patients who have started their CPAP treatment are attached. Despite the guidance on how to use the sleep apnea DCP, there were still patients who did not use it. The main aim of this study was to determine whether the main objectives of the introduction of the sleep apnea DCP had been achieved.

Material and Methods: The data from sleep apnea DCP users (n = 58) and nonusers (n = 33) were collected through surveys between May 2021 and June 2022. Six health care professionals (HCPs) were interviewed in May and June 2021.

Results: A larger proportion of sleep apnea DCP users than of nonusers were better prepared for CPAP therapy guidance sessions, as a greater proportion of them had familiarized themselves with information about CPAP therapy before the first CPAP therapy guidance session (43/58, 74% vs. 16/33, 49%; p = .022). According to the study results, CPAP adherence was high among both sleep apnea DCP users and nonusers. The introduction of the sleep apnea DCP had not yet brought significant improvements in the workload and work practices of HCPs. In some cases, the sleep apnea DCP had resulted in more flexibility in the work of HCPs.

Discussion: According to the results of this study, not all the goals set for the introduction of the sleep apnea DCP had been achieved.

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The author acknowledges following research group for the preparation of this keynote lecture:
Jari Haverinen MSc (Eng), MHSc 1,2; Terttu Harju MD, PhD 3; Hanna Mikkonen RNC 3; Pia Liljamo PhD, RNC 4; Miia Turpeinen MD, PhD 3,5; Jarmo Reponen MD, PhD 2,5
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3The Wellbeing Services County of North Ostrobothnia (Pohde);
4Finnish Institute for Health and Welfare (THL);
5Medical Research Center Oulu, Oulu University Hospital and University of Oulu

Tutkimus mielenterveyden hoitopoluista työterveyshuollossa koneoppimismenetelmiä hyödyntäen

Pekka Varje, Research Manager at the Work Ability and Work Careers - department
Työterveyslaitos/Finnish Institute of Occupational Health

Biography Pekka Varje

Pekka Varje, PhD, works as a Research Manager at the Work Ability and Work Careers - department of the Finnish Institute of Occupational Health. In this position he promotes population-level research on occupational health and work ability. His own research area includes topics related to the mental health, and in his research projects he has aimed at developing machine-learning -based approaches to the data-driven analysis of mental health and the occupational health care. Additionally, Varje leads the visualization and open publishing of data and research findings in the Work-Life Knowledge Service. Varje has a background in history and in his doctoral thesis he analyzed the changing role of emotions and personality in Finnish work life during the post World War II -era.

Background: Mental health problems are a major concern for Finnish working life. Mental disorders are the largest cause of work disability pensions in Finland and sickness allowance periods related to mental disorders have been rapidly increasing in recent years. For economic and social sustainability, it is important to develop new methods for promoting mental well-being and preventing mental disorders. Previous research has mainly analyzed mental health and work disability using materials collected at specific points in time, e.g. questionnaires or register data, that do not offer a dynamic view of the developments in work ability or mental health. However, the digital systems of occupational healthcare providers offer huge amounts of time-stamped data that can be used to analyze the treatment paths related to health issues and work ability. The development machine learning has opened new opportunities for efficient data-driven analysis of these data and for producing predictive models. These methods enable us to draw a dynamic view of how different background factors and treatment paths lead to specific outcomes in terms of mental disorders and work ability.

Aim the project: The overall goal of the project is to assess mental health treatment paths in occupational health care by utilising machine learning methods and predict future ability to work based on treatment paths, individual factors and workplace features. Our aim is to identify paths, events and service themes that predict a future mental health diagnosis or ability to work. A treatment path is widely understood to include everything from the basic processes of occupational health care cooperation and events preceding a mental health diagnosis to various support measures that enhance the ability to work. The project findings will help identify paths that lead to a positive outcome, which will allow treatment to be planned efficiently and promote the preventative work done in occupational health care.

Results: The research findings will cover five topics: 1) identifying and categorizing occupational health care treatment paths pertaining to mental health, so that they can be utilised in creating prediction models and determining practical guidelines, 2) generating new information on the ways in which business texts connected to the occupational health care cooperation's core processes (health check-up, workplace review and action plan) steer the treatment paths linked to mental health, 3) creating a categorisation model that is able to predict the risk of a mental health diagnosis at the individual level, based on business texts, occupational health care surveys and events preceding a diagnosis, and identifying the key predictive factors, 4) predicting the future ability to work and identifying those occupational health care treatment paths that will have a positive impact on the future ability to work, and 5) generating new information on the seasonal fluctuation of mental health related service themes and treatment paths, as well as on their temporal changes in connection with the coronavirus pandemic.

Discussion/what is happening next: The project extends from 2023 to 2025 and it is still at an early stage. The analyses will begin during late 2023 and main findings will be produced during 2024. The research findings will be published in scientific articles, conference presentations and in a final report, which will be made openly available. In addition to that, the findings will be presented at events and in publications intended for occupational health care professionals, as well as in the Work-Life Knowledge Service produced by the Finnish Institute of Occupational Health. Based on the project findings, we will develop knowledge-based operating models for occupational health care and occupational health care cooperation together with professionals of these spheres.

O-9: Telephone Consultation as a sustainable method of service delivery in occupational medicine: results of a qualitative study

Abigail O'Reilly [1,2], MB BCh BAO, MRCPI, MFOM, Conor Loftus [1], MB BCh BAO, MICGP, MFOM, Hemal Thakore [1], FFOMI
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Introduction: Since the pandemic, telephone consultation is still widely used in Occupational medicine practice, but with a seemingly huge variety depending on the different occupational medicine departments and companies. Telephone consultation could be considered a sustainable alternative to face-to-face consultation in the long term. The aim of this research project was to start an evidence base for the opinions of Occupational Health Physicians regarding telephone consultation. This study also sought to gather further information on the perceived benefits and limitations of telephone consultation as per its current users (Occupational Health Physicians) and identify ways to improve the practice of telephone consultation. This study commences an evidence base for the opinions of OHPs (occupational health physicians) regarding telephone consultation and highlights a current gap in policy and guidance for the practice of telephone consultation in occupational medicine. [1,2,3]
Material and Methods: This research project involved interviewing Occupational Health Physicians and analysing the data collected (using thematic analysis methods) so that the effectiveness of telephone consultation as a means of consultation could be reviewed. Semi-structured interviews were carried out with eighteen specialist occupational medicine physicians. Data was initially coded and then organised into themes. Ethical approval was sought from and granted by the Royal College of Physicians Ireland Ethics Committee.
[4,5].
Results: The main findings from this research project identified five major themes: Quality of Care, Professional Standards, Barriers to Telephone Consultation, Optimal Use of telephone Consultation, and Potential Improvements and Useful Change for Telephone Consultation. Some of these themes have previously been identified in research of other medical specialities. [1,2,3,4]
Discussion: Upon consideration of the themes and subthemes identified in this study, gather further information on the perceived benefits and limitations of telephone consultation. Further research into this area with pilot studies or comparative trials will provide more definitive answers as to the role of telephone consultation in occupational medicine into the future. Telephone consultation would appear to be a sustainable method of service delivery in occupational medicine. Clinical governance for telephone consultation in Ireland is currently lacking and there is no clinical guidance available that is specific for occupational medicine. If telephone consultation is to be considered a sustainable method of service delivery in Occupational medicine, a solid foundation of clinical guidance and governance will be required. []
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O-10: Healthcare professionals' digital health competence profiles and associated factors: a cross-sectional study

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Introduction: As practices and processes related to the delivery of healthcare are increasingly digitalised, healthcare professionals should have appropriate knowledge, skills, abilities, and attitudes to use and evaluate digital technologies at work [1,2]. Healthcare professionals' digital health competence includes the skills to use information technologies and interact in digital environments, ethical competence, competence to utilise and evaluate digital solutions and the attitude to take advantage of digitalisation [3,4]. Colleagues and managers as well as organisational practices and education possibilities are recognised factors associated with digital health competence [5]. Still, studies determining healthcare professionals' digital health competence levels and different factors' effect on digital health competence are scarce. The purpose of the study was to identify healthcare professionals' digital health competence profiles and explore associating educational and organisational factors.

Material and Methods: The study followed a cross-sectional research design. Data was collected with an electronic questionnaire from nine healthcare organisations across Finland in spring-summer 2022. Recently developed digital health competence instrument (42 items) and associating educational and organisational factors instrument (15 items) [4] were used in data collection. 817 professionals responded to the questionnaire. Cluster analysis was used to build digital health competence profiles and binary logistic regression analysis was used in exploring how different factors are associated with professionals' digital health competence.

Results: Cluster analysis detected three digital health competence profiles: high competence (profile A, n = 336), good competence (profile B, n = 352) and mediocre competence (profile C, n = 129). Digital health competence and associated factors showed significant differences between the profiles ($p < .001$). ICT competence was evaluated as strongest in all profiles as human-centred remote counselling competence was evaluated as lowest.
Binary logistic regression models predicted that age, graduation year, clinical working environment, professional background, amount of patient work and educational and organisational factors affect digital health competence. Higher age was associated with lower digital health competence as more recent graduation year was associated with higher digital health competence. Additionally, working in outpatient or home care environments, having background as a leader or specialist and having no patient work were connected to higher evaluation of digital health competence.

Discussion: Healthcare professionals evaluate their competence in digital health generally as good or high because over 84% of the respondents included in either profile A or B. Especially clinical working environment and professional background were associated with different areas of digital health competence. Therefore, actions utilised to develop digital health competence should consider specifically the work position and environment. Further research is needed on healthcare professionals' digital health competence in an international level.

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O-11: The extent and impact of digital services in healthcare and social welfare - An umbrella review

Sanna Lakoma[1], MD, MPH, Doctoral researcher, Henna Härkönen[2], MSc, Doctoral researcher, Anastasiya Verho[1], MD, Postdoctoral researcher, Paulus Torkki[1], Associate Professor, Riikka-Leena Leskelä[3], PhD, Research Director, Paula Pennanen[3], MSc, Senior manager, Elina Laukka[3], PhD, Managing Consultant, Miia Jansson[2], Adjunct professor, Senior researcher
[1]University of Helsinki, Finland
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[3] Nordic Healthcare Group, Finland

Introduction: Digital services can be effective and cost-effective options to treat non-communicable diseases, but the generalizability of the results has found to be limited due to heterogeneous treatment effects [1]. The aim of this umbrella review was to provide a comprehensive and up-to-date overview of the impact of digital services on population health, service costs, and patient and provider satisfaction.

Material and Methods: A systematic search of the literature was performed in the Centre for Reviews and Dissemination, Cochrane, Ovid Medline, Scopus, and Web of Science in June 2022. Digital services were defined using the World Health Organization's classification of digital health interventions [2]. The study selection and quality assessment were carried out by two researchers independently [3]. The impact of digital services was evaluated narratively by using the Quadrable aim (no evidence, no dominance, mixed-and positive effect).

Results: A total of 537 reviews were retrieved. Sixty-six systematic reviews were included. Forty-three (65 %) reviews evaluated the impact of digital services on population health outcomes with mixed effects; 18 (27 %) reviews on patient satisfaction with positive effects; 14 (21%) reviews on cost reduction with positive effects; and five (7.6 %) reviews on healthcare professionals' satisfaction with mixed effects.

Compared to usual care, the overall impact of digital services was positive on quality of life and self-care, but the impact of digital services was mixed on blood pressure and lipid control in cardiology and multimorbidity. In addition, the overall impact of digital services was positive on blood pressure control but mixed on blood glucose and lipid control, diabetic complications, and metabolism in endocrinology. Compared to usual care, digital services had no dominance in dermatology and neurology, but the impact of digital services was mixed in psychiatry and pulmonology. More antibiotic treatments were prescribed in patients using digital services than patients using usual care. Compared to usual care, digital services had a positive impact on the healthcare costs in cardiology, dermatology, and palliative care, and mixed in psychiatry. The impact of digital services on healthcare resource utilization was, however, mixed. The impact of digital services on patient experience was positive when digital services were accessible, easy to use, improved patient-provider communication, and included additional treatment options (e.g., usual care). Health care professionals had concerns regarding the impact of digital services on the workload. The impact of digitalization in social welfare is unclear.

Discussion: Digital services have been developed and deployed rapidly, especially after the onset of the COVID-19 pandemic. Compared to usual care, digital services had positive or equal impact on population health outcomes and costs. Further research on healthcare and especially social welfare is needed to evaluate the long-term effects.

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O-12: HEI co-creating a service ecosystem for supporting digitalization in health and welfare

Hannu Tikkanen[1] DSc, Outi Ahonen[1] DSc, Ruusa Ligthart[1] DSc, Anna Salmi[1], MA, Doctoral Candidate
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Introduction: This study focuses on how higher education institutions (HEI) co-create service ecosystems with public, private and third-sector organizations in the health and welfare sector. The study draws on research on service ecosystem design, open innovation and co-creation. Services and ecosystems are regarded as highly relevant to today's networked and service-led society [1, 2]. The successful design and delivery of innovation in services and complex service systems [2] is crucial to the health and welfare sector, where digitalization plays an increasingly important role [1, 3].

Material and Methods: A qualitative study approach was chosen to examine how public, private and third-sector organisations in the health and welfare sector see their role in the ecosystem. Data collection included group and individual interviews from key informants. Key informants help the observer to understand the happenings in the context and reasons behind them. Informants in this research were senior management or specialists with experience in development and utilization of health care ecosystems. with titles, for instance, product and development manager, executive director, EU/governmental officers, academic researchers and experts, wellbeing services county officers, hospital district development managers, entrepreneurs. They were invited through personal contacts of the researchers and organizations and among previous research partners. Altogether, 29 people participated in seven group and 5 individual interviews.

Results: In the results we identified barriers and drivers of ecosystem collaboration. Barriers include e.g. limited time resources for cooperation; limited awareness of different organisations, especially regarding the third sector; differences in funding models, limited understanding of the expertise and potential benefits from collaboration with certain types of organisations; as well as procurement legislation. Drivers of ecosystem collaboration include digitalization, increasing cost pressures, realization of joint advantages, and overall attitudes towards interorganizational openness. Especially the potential of startups and patient organizations were highlighted in the shift towards more patient-centric and inclusive service ecosystems, which constitute key objectives of these ecosystems.

Discussion: Our results support the notion that working in ecosystems is needed in healthcare sector in Finland [1]. The study contributes to research on service ecosystem design and research on innovation in the health and welfare sector by discussing how HEI:s can play an important role in the co-creation these ecosystems. The results indicated that the professionals in the health care sector recognize the importance of professional competences needed to collaborate in ecosystems, further highlighting the role of HEI:s. Nevertheless, development and learning need to be systematized and integrated in the practices and structures in the field. However, it might be challenging to work in the ecosystem if there are competitions in the same ecosystem. Our study also supports the notion in service ecosystem research that different ecosystem actors are framed by different institutional logics, which guide their goals and activities [3].

References:
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Sessio 4A: European legislation and regulation

Puheenjohtaja: Anna Salmi, Laurea ammattikorkeakoulu

Chair: Anna Salmi, Laurea University of Applied Sciences

Perjantai 13.10.2023 – Friday 13th of October 2023

9:00 – 10:30

4A-1 What does European Health Data Space bring to us?

Markus Kalliola, Project director
SITRA

4A-2 Fin-OMOP Common Data Model at Auria Clinical Informatics

Arho Virkki, Chief Analytics Officer
Wellbeing services county of Southwest Finland

4A-3 Research cooperation in Europe and beyond

Kimmo Porkka, M.D, Ph.D. is a professor of clinical hematology at the University of Helsinki, clinical position at HUS Comprehensive Cancer Center Hematology Research Unit Helsinki
University of Helsinki/HUS Comprehensive Cancer Center Hematology Research Unit

5 min rapid scientific presentations

O-13 Participation and social inclusion through intelligent clothing – from handcrafted designs to tools supporting an individual's everyday life

Tiina Vuohijoki[1], Master of Health Care in Degree Programme in Welfare Technology, Tiina Ihalainen[2], Ph.D., Sari Merilampi[3], DSc, MSc, Johanna Virkki[1], DSc, MSc, MA
[1] Faculty of Information Technology and Communication Sciences, Tampere University, Tampere, Finland
[2] Faculty of Social Sciences, Tampere University, Tampere, Finland
[3] Faculty of Technology, Satakunta University of Applied Sciences, Pori, Finland

O-14 Effects of educational intervention on competence in digital well-being among professionals

Mimmi Saarinen[1], MHSc student, Krista Hylkilä[1], MHSc, Aino Peltonen[1] MHSc student, Riina Jämsä[1], MHSc, Sanna Tiuraniemi[1], MHSc, Niko Männikkö[12], PhD, Docent, Merja Männistö[2], PhD, Johanna Jylhä-Ollila[2], MHSc, Maria Kääriäinen[1], PhD, Professor[13]
[1] University of Oulu, Research Unit of Health Sciences and Technology
[2] Oulu University of Applied Sciences
[3] Wellbeing services county of North Ostrobothnia

O-15 Students' evaluation of capabilities acquired in the Specialization Education in Digital Health and Social Care Services and their application in working life

PhD Päivi Sanerma[1], MSc Anna Rauha[2], MNSc Hanna Naakka[1], PhD Outi Ahonen[3]
[1] HAMK University of Applied Sciences, HAMK SMART research unit
[2]Seinäjoki University of Applied Sciences, Seinäjoki, Finland
[3] Laurea University of Applied Sciences, Espoo, Finland

O-16 Remote joint negotiation in supporting employee's ability to work -Enablers and challenges in the implementation of online meetings

Sanna Pesonen[1] M.Sc, Inka Koskela[1] M.Sc, Pirjo Juvonen-Posti[1] PhD, MD, PD, Erja Sormunen[1] PhD
[1] Finnish Institute of Occupational Health

O-17 Reverse mentoring in developing the digital competences of health care professionals

Merja Männistö[1], PhD
[1] Oulu University of Applied Sciences, Finland

O-18 Digital competence and health literacy for those at risk of type 2 diabetes

Elisa Airikkala, Mari Laaksonen
[1]Tampere University of Applied Sciences, Finland

What does European Health Data Space bring to us?

Markus Kalliola, Project director
The Finnish innovation fund Sitra

Biography Markus Kalliola

Markus Kalliola is the project director in Health data 2030 project in The Finnish Innovation Fund Sitra and the coordinator of Joint Action Towards The European Health Data Space (TEHDAS). Prior to Sitra he worked in the European Commission in DG Health and food safety where he was responsible of the cross-border healthcare IT projects. Mr. Kalliola has vast experience in data economy and in the next years he will work towards healthier and fairer data economy for Europe as well as towards more competitive health data ecosystem in Finland. Mr. Kalliola holds a positions of trust in · HMA-EMA joint big data steering group, · HMA-EMA Darwin EU advisory board · DNV Digital health advisory board · EDAH advisory board · HealthHub Finland EDIH advisory board · Steering group for the secondary use of health data in Finland.

Fin-OMOP Common Data Model at Auria Clinical Informatics

Arho Virkki, Chief Analytics Officer
Wellbeing services county of Southwest FinlandConsortium

Biography Arho Virkki

Arho Virkki, PhD, MSc (Tech) works as Chief Analytics Officer at the Wellbeing services county of Southwest Finland. He is also an Adjunct Professor at Department of Mathematics and Statistics at the University of Turku. His research interests include statistical disclosure control, data mining and mathematical modeling for decision support. At Auria Clinical Informatics, his key goals include providing researchers and specialists with high-quality patient data in pseudonymized or anonymized format to facilitate the development of data-driven approaches for precision medicine.

Auria Clinical Informatics (ACI), a department at the Wellbeing services county of Southwest Finland (Varha), is the first European Union Digital Innovation Hub in the health sector in Finland. Our main task is to serve researchers with high quality data. In addition to that, we offer advice on data interpretation and software solutions speeding up scientific research. By working with local clinical experts we ensure data quality and correct interpretation. We serve both basic academic research and industry-sponsored scientific studies.

Since 2021, The data has also been available in the international OMOP CDM format. At the moment, the data covers the public specialist health care and most emergency health care in the area of Southwest Finland for all demographic groups. The most relevant data domains are patients, visits, inpatient episodes, diagnoses, laboratory results, procedures, medication, pathology, radiology, radiotherapy, chemotherapy, obstetrics and narrative patient reports. However, there are also other data domains available.

The presentation covers our latest developments and future directions with OMOP model. These include the formulation of Fin-OMOP consortium, a joint effort between Varha, Pirha and HUS to build a contact point for wider OMOP data related research questions. We also have several projects starting that aim to produce high-quality, anonymous synthetic data using the OMOP model. Responsible use of patient records requires a culture of trust and a working environment fit for purpose. To meet the expectations, ACI has chosen an active and pragmatic approach to develop data protection that combines physical cybersecurity with statistical disclosure control.

Research cooperation in Europe and beyond

Kimmo Porkka, M.D, Ph.D., professor of clinical hematology, clinical position
University of Helsinki/HUS Comprehensive Cancer Center Hematology Research Unit

Biografia Kimmo Porkka

Kimmo Porkka M.D, Ph.D. is a professor of clinical hematology at the University of Helsinki and his current clinical position is Head of the Department of Hematology at the Helsinki University Hospital Comprehensive Cancer Center in Finland.
Dr. Porkka received his medical degrees at the Universities of Turku and Helsinki in Finland. He has received clinical training in oncology, internal medicine and hematology. Dr. Porkka`s research experience includes clinical epidemiology, clinical cancer research, human molecular genetics (genetic mapping of complex diseases), basic and applied cancer research on characterization of leukemia-specific proteins and ligands (post-doctoral visit at the Burnham Institute, La Jolla, USA).
Dr. Porkka`s current research interests relate to molecularly targeted therapies and immunotherapy of hematological malignancies. He has been the principal investigator in >40 Phase I-III clinical drug trials (academic and company-sponsored) on acute and chronic leukemias and performed closely linked translational science projects focusing on predictive biomarker discovery. He focuses on individualized therapy of relapsed acute leukemia and particularly interested in applying novel computational tools for integration and harmonization of deep disease profiling and clinical datasets residing in hospital datalakes for machine-assisted diagnostics, treatment selection and clinical trial matching.

O-13: Participation and social inclusion through intelligent clothing – from handcrafted designs to tools supporting an individual's everyday life

Tiina Vuohijoki[1], Master of Health Care in Degree Programme in Welfare Technology, Tiina Ihalainen[2], Ph.D., Sari Merilampi[3], DSc, MSc, Johanna Virkki[1], DSc, MSc, MA
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Introduction: Participation is a vast subjective concept and has various definitions: World Health Organization defines participation as "involvement in a life situation" [1]. Then, the International Classification of Functioning, Disability and Health (ICF) includes subtlety of being autonomous or in control of own life, assisted, if not able to act themselves [2]. Perceived participation is one of the fundamental resources considering one's well-being and quality of life, however, involvement in life situation might weaken due e.g., cognitive, or physical challenges. A diverse repertory of assistive technology exists, but they cannot be adjusted to meet individual needs thus they might even difficult participation. Differing from devices yield from mass production, as my doctoral thesis, I aim to develop intelligent clothing technologies that could be home crafted to suit the personal needs. Moreover, when handcrafting assistive tools, the aesthetical appearance is most likely to be desirable, thus the user acceptance might be better. The research questions are defined as follows: 1) How and with what kind of intelligent clothing could support participation and social inclusion? 2) How to fabricate intelligent clothing with traditional handcrafting?

Material and Methods: The first research question is answered with ideation workshops and laboratory examinations. Furthermore, the second research question is answered with prototyping and with practical evaluation. The dissertation is a collection of five articles and contains detailed hands-on work with tangible prototyping and development of handcrafted patterns for assistive tools unforeseen. These results are beneficial to 1) technology developers generating innovations and 2) all those who in the future could home-craft their own intelligent clothing. Moreover, this research contributes to accessible and equal society.

Results: According the results participation could be supported with clothing that supports the individual's independence, offers timely help only when it is needed, increases safety, and assists with communication and with self-regulation. [3] The Smart Jacket with integrated nurse call [4] and a neck gaiter aiming to trace swallowing movements [5], both address the challenges with safety and reduced independence. Then, intelligent clothing could be fabricated with hand-stitched [6] and punch-needled [7] passive UHF RFID tags, as both techniques were discovered operative.

Discussion: The aim was to explore how intelligent clothing could serve the individual looked from the perspective of participation, therefore, ideation workshops were organized. Themes related to Quality of Life and Well-being (such as independence and self-regulation) were identified. In addition, an alternative option to mass-produced assistive tools should be offered, thus hand-crafted technology must be developed. Thus, handmade operative passive UHF RFID tags were evaluated, and future research will explore the effortless way of connecting them to, for instance, smartphones with limitless opportunities of application designs. Further, as the preliminary results are encouraging, the development of these crafted designs toward sustainable, reparable, and transformable solutions will be continued.

References: References are available from the authors

O-14: Effects of educational intervention on competence in digital well-being among professionals

Mimmi Saarinen[1], MHSc student, Krista Hylkilä[1], MHSc, Aino Peltonen[1] MHSc student, Riina Jämsä[1], MHSc, Sanna Tiuraniemi[1], MHSc, Niko Männikkö[1,2], PhD, Docent, Merja Männistö[2], PhD, Johanna Jylhä-Ollila[2], MHSc, Maria Kääriäinen[1], PhD, Professor[1,3]
[1] University of Oulu, Research Unit of Health Sciences and Technology
[2] Oulu University of Applied Sciences
[3] Wellbeing services county of North Ostrobothnia

Introduction: The use of digital media (social media, digital gaming) is an integral part of adolescents' life and affects their health and well-being positively and negatively. Professionals working with them (e.g., teachers, school nurses) are in a crucial role to support adolescents' digital well-being. However, the professionals have knowledge needs on effects of the digital media use on adolescents' health and well-being.

Material and Methods: The RCT study design was used. Participants (n = 100) from DigiWellPro 3 ECTS online course were randomly allocated to the experimental and control groups. Experimental group studied in online escape game and control group in online learning environment. Aim of education was to develop the professionals' competence to identify the effects of digital media use to adolescents' health and well-being and to strategies to support them. Digital well-being was measured before and after the course with DigiWellComp Instrument developed for this study. Data analysis is in process.

Results: The results will be presented in the conference.

Discussion: This research will provide new information on the effects of educational intervention on digital well-being among professionals working with them. The results can be used in the developing basic and continuing education in the field of healthcare, social services and education.

O-15: Students' evaluation of capabilities acquired in the Specialization Education in Digital Health and Social Care Services and their application in working life

PhD Päivi Sanerma[1], MSc Anna Rauha[2], MNSc Hanna Naakka[1], PhD Outi Ahonen[3]
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[3] Laurea University of Applied Sciences, Espoo, Finland

Introduction: Improvements in the microarray devices has increased the accumulation of DNA microarray data. With this advancement, physicians will be able to simultaneously examine different aspects of gene expression in an experiment to diagnosis or classify various types of cancer and other diseases [1]. The rapid growth of data accumulation in the fields of medicine has posed a major challenge for data processing and analysis techniques. This enormous amount of microarray data cannot be analyzed by physicians in a short time to speed up diagnosis, prognosis, and treatment plans. Thus, it is important to develop a digital solution that can handle this large number of e-healthcare data efficiently. Therefore, DNA microarray classification has become critical to the DNA microarray analysis. Moreover, high dimensional DNA microarray has presented serious challenges to the existing machine learning and classification methods. In other words, in many of cancer and microarray datasets, it is possible that many genes are irrelevant or redundant for machine learning algorithm. Besides, lack of explainability and interpretability is often seen as a challenge that restricts the wide spread of machine learning technology in health sector.

Material and Methods: In this study a novel explainable cancer prediction model is proposed. The developed model consists of four main steps. In the first step, the primary genes are represented as a graph. In this graph, each gene is demonstrated by a node and the edge weights show the similarities between genes. In the second step, an iterative process is performed to find gene communities. Next, those of high score genes are chosen from each community to generate the final gene set. It is expected that the developed gene selection strategy, while choosing a subset of genes with the least redundancy, will also maximize the relevance of these genes with the label of medical data. Finally, in the fourth step, a decision tree-based prediction technique is developed to improve the explainability of the learning algorithm. Transparency of decision tree makes it widely employed for machine-learning problems that require an understanding of both the model structure and its prediction.

Results: The performance of the developed approach are compared with three new cancer prediction model: FSARM [2], BHAPSO [3] and, AHEDL [4]. Five publicly datasets were employed: Colon, Leukemia, SRBCT, Prostate Tumor, and Lung Cancer. The results of the experiments show that in all cases the proposed method performs better than the other cancer prediction model. For example, the result reveals that the prediction accuracy of the developed model on the Colon dataset was 89.13%, which is 1.85% higher than the average classification accuracy for the second-ranked method (i.e., FSARM). Similarly, the average accuracy of the developed approach in all microarray data was 87.91%, which is 2.93% higher than the average prediction accuracy for the second-ranked method (i.e. FSARM).

Discussion: In this study an efficient multi-objective graph-based gene selection search strategy is developed that can efficiently and effectively delete irrelevant as well as similar genes. Moreover, this study proposes an artificial intelligence decision system to provide physicians with a simple and human-interpretable set of rules for cancer prediction. In contrast to previous deep learning-based cancer prediction models, which are difficult to explain to physicians due to their black-box nature, the proposed prediction model is based on a transparent and explainable decision forest model.

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O-16: Remote joint negotiation in supporting employee's ability to work -Enablers and challenges in the implementation of online meetings

Sanna Pesonen[1] M.Sc, Inka Koskela[1] M.Sc, Pirjo Juvonen-Posti[1] PhD, MD, PD, Erja Sormunen[1] PhD
[1] *Finnish Institute of Occupational Health*

Introduction: Joint negotiations are an essential means of collaboration between an employer, an employee, and an occupational health services representative in supporting employee's ability to work [1]. An increasing number of negotiations are held via videoconferencing, due to the digital transition in working life. During the last years the digital transition in occupational health services has also been accelerated by the COVID-19 pandemic [2]. This study is part of a project called "Remote joint negotiations – new practice and well-functioning interaction in supporting work ability". The study is funded by The Finnish Work Environment Fund and conducted in co-operation between the Finnish Institute of Occupational Health and the University of Tampere. The aim of this study is to explore the participants' experiences of the benefits and challenges of remote joint negotiations.

Material and Methods: The study relies on qualitative research methods and multi-data study on 10 remote joint negotiation cases in 2022 -2023. In total, 40 persons participated the study (n= 10 occupational health physicians, n= 10 employees, n= 11 employers, n= 3 occupational health nurses, n= 4 HR management representatives, n=2 work ability coordinators). The data of this study consists of audio recorded individual interviews after the negotiation (n=38). We had five negotiations in which all the participants were online as well as five hybrid negotiations in which some of the participants took part onsite, typically in the facilities of the occupational health services clinic. The data was analyzed by inductive content analysis.

Results: Participants' experiences of benefits and challenge of the remote joint negotiation can be classified into two main themes: practical arrangements and interaction. In relation to the practical arrangements, the ease of scheduling and taking part in the negotiations regardless of location and time saving are perceived as benefits of remote joint negotiation. On the other hand, the technical problems of remote connections related to practical arrangements and the difficulty of finding a peaceful negotiation space are perceived as factors that make negotiations difficult. From the perspective of interaction, there are also factors that promote and complicate remote negotiation. Despite the remote connection, the possibility of video conferencing is perceived to promote interaction between participants. On the other hand, the feeling of being outside, the difficulty of participating in the conversation, and the difficulty of interpreting facial expressions and gestures are perceived as making it difficult to carry out negotiations remotely.

Discussion: Factors related to practical arrangements and interaction should be considered when planning and implementing remote joint negotiations. These two dimensions are also intertwined, as for instance the technical quality of the connection affects the ways the participants are able to participate and communicate with one another. These joint negotiations always deal with sensitive and confidential matters. Because of this, matters related to the functionality of the ICT connections, data protection and to the remote negotiation practice must be instructed. For all participants, that is the employees, the supervisors and the OH representatives', attention must be paid to their own ICT connections and practice in every negotiation. The results of the study can be widely used both in workplaces, in occupational health care, and in the field of work-related rehabilitation in the development of remote services.

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O-17: Reverse mentoring in developing the digital competences of health care professionals

Merja Männistö[1], PhD
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Introduction: A major goal in Finnish health care is to develop the digital competence of citizens and professionals [1]. Health professionals must have strong skills to apply new technological solutions in practice. In particular, well-being-enhancing and health-promoting activities related digital solutions play a key role. [2]. Nurses are satisfied with the possibilities of information systems to support collaboration and information flow. Collegial and organizational support are relevant factors in generating positive experiences and thereby changing attitudes positive towards digitalization in health care. [3]. Reverse mentoring is a mentoring process in which the roles of traditional mentoring are reversed. The less experienced person acts as a mentor to the more experienced person [4, 5]. In reverse mentoring, learning is mutual. For example, the less experienced person can teach the more experienced person digital skills, while the more experienced person can share their tacit knowledge which comes from work experience [4]. Reverse mentoring allows also the less experienced to develop their teaching and leadership skills [5] Reverse mentoring promotes knowledge sharing within an organization and enhances better collaboration by reducing silos and hierarchies between different professionals and generations [4]. The purpose of this study is to describe the reverse mentoring in digital competence piloted by public health nurse students during a practical training period in public health care as a part of a wider research project. The aim is to develop low-threshold methods to influence attitudes and develop digital competence.

Material and Methods: Oulu University of Applied Sciences' public health nursing students (n=46) observed and interviewed public health nurses and carried out a reverse mentoring exercise for their chosen digital competence area. Nurses' general technological competence and digital attitudes were mapped using an observation matrix and interview based on previous studies. The observation matrix included 14 different observation items (from areas of openness, constraint and motivation) and the 1-4 Likert scale rating. The questions in the observation matrix allowed the observer to add free comments. The interviews included public health nurses' views on the digitalization of healthcare, the support they have received and what they would need to strengthen their digital skills. After the observation and interviews, the students were left to decide for themselves in which situation or which digitalization-related issue they would like to pilot through reverse mentoring.

Results: A total of 331 observations were made in the matrix. Based on the observations, the majority of nurses had a positive and accepting attitude towards digitalization, but there were concerns about the increase in workload and uncertainty about the functionality of equipment and software. Public health nurses felt their current digital skills largely adequate. The support of colleagues in terms of digital competence was identified as important. Younger professionals were often asked for help with digital skills. Support from the organisation was sometimes perceived as insufficient. Public health nurses need easily accessible and repeated education on the use of different digital systems and flexible online courses. Some of them need support in using social media in their work. Reverse mentoring was carried out on a variety content of digital competences. Software used at work and Office tools (Word, PP presentation, Teams) garnered most of reverse mentoring items. Social media received many mentorships. There were also some items related to patient information systems, smart devices and emails. There were a certain extend items related to wellness and health technology. The students found the reverse mentoring more difficult if the mentor was a recently graduated nurse or a young colleague. Older colleagues who had worked in the health care sector for a long time were perceived as easier to mentor because they had more digital competence areas for development to choose from.

Discussion: The students carried out reverse mentoring by guiding many different areas of digitalization-related competences e.g. the use of Office tools and social media at work. The clients of public health nurses are mostly young adults for whom the use of the internet comes naturally. The use of the internet as a channel for information and guidance has increased in the work of public health nurses. This requires a range of digital competence. To address this need, the reverse mentoring method offers students the opportunity to act as mentors. The traditional role of the trainee becomes reciprocal with that of the workplace mentor. Reverse mentoring gives the student a new role, as he/she acts as a mentor to a professional. The mentoring becomes two-way and mutually. The students' feedback and evaluations were positive and supportive of the reverse mentoring approach. The method was described as agile and easy to implement. The challenge of reverse mentoring is the genuine identification of the professional's own skills and competence needs. There must also be sufficient time for reverse mentoring.

References: References are available from the authors

O-18: Digital competence and health literacy for those at risk of type 2 diabetes

Elisa Airikkala[1], MHS, Senior Lecturer, Mari Laaksonen[1], MHS, Senior Lecturer
[1]Tampere University of Applied Sciences, Finland

Background: The time of the COVID-19 epidemic emphasized the need for the development and implementation of remote receptions and digital services, as preventive work was reduced, and people decreased their in-person visits due to fear of infections. In 2020, the diagnoses of type 2 diabetes decreased by as much as 21% [1], despite the fact that diabetes is known to be increasing. The DIGIDIA (Promoting Digital Skills in the Low Labour Market-Driven Diabetes Patients) project aimed to respond to this need. The target groups of the project were individuals at risk of type 2 diabetes, those with prediabetes, and recently diagnosed individuals, especially those in a vulnerable labor market position. The project focused on developing health communication and digital inclusion.

Aim of the project: The aim of the DIGIDIA project was to develop digital competence, health literacy, and practices that enable preparation for future unforeseen events. The project recruited adults aged 18-64 from Tampere who were at risk of type 2 diabetes or had recently received a diagnosis of prediabetes or type 2 diabetes (n=60). Participants were asked to respond to pre and post project surveys on digital competence, health literacy, involvement, well-being, and genomic knowledge.

Participants were provided with a digital learning environment for the prevention of type 2 diabetes, through which they could acquire information to support their health. Using the tasks in the learning environment, participants assessed and reflected on their own health and sought motivation for lifestyle changes. Workshops were organized to practice the use of local and national digital health services and to discuss critical digital and health literacy. The goals of the learning environment and workshops were to develop participants' health literacy, increase their digital competence and involvement. Individualized guidance to support self-care was primarily offered through the VideoVisit service. In this individualized guidance, participants also received information about their individual genomic risk, Polygenic Risk Score (PRS), for type 2 diabetes. The project also developed an individual guidance model and collaboration model to support local stakeholders.

The DIGIDIA project was funded by the REACT-EU instrument as part of the European Union’s response to the COVID-19 pandemic. The project partners were Tampere University of Applied Sciences, the City of Tampere, the Finnish Diabetes Association, and the Finnish Institute for Health and Welfare (THL). Project duration: 1st October 2021 – 31st December 2023.

Results: A feedback survey on the workshops was completed by 21 participants. Of the respondents, 66.7% felt that the workshops helped them familiarize themselves with digital systems, 14.3% were unsure, and 19.0% disagreed. The workshops helped 66.7% of the respondents in using digital health services, 19.0% were unsure, and 14.3% disagreed. The workshops increased motivation for healthier choices for 90.5% of the respondents, while 9.5% strongly disagreed. When using digital services, respondents encountered challenges in finding information. Network connectivity issues and lack of digital skills were also perceived as challenging. Users expressed a desire for services to be user-friendly, clear, and also hoping for quicker response times. Remote consultations were desired with actual professionals instead of pre-programmed virtual responses from chatbots. Digital services were expected to have interactive features, such as tasks, reminders and feedback.

Discussion: The digital skills of the DIGIDIA project participants varied greatly. When designing digital services, it is important to consider that some citizens do not have sufficient digital skills to utilize these services. Therefore, it is crucial to actively encourage and assist citizens in using digital services in healthcare. Strengthening digital skills should be integrated into every healthcare encounter. Supporting citizens' digital skills should be recurrent, strengthening individual abilities. The feedback survey showed that separately organized workshops are also beneficial both for familiarizing individuals with digital systems and for using digital services.

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Session 4B: Haavoittuvat ryhmät

Chair: Soile Juujärvi, yliopettaja, Yliopettaja, Senior lecturer, Laurea
Friday 13th of October 2023

9:00 – 10:30

4B-1 Väestökyselyn tarjoama näkymä sosiaali- ja terveydenhuollon digitaalisten palveluiden käyttöön: ketkä jäävät ulkopuolelle?

Maiju Kyytsönen, sh, TtM, väitöskirjatutkija, Digitaalisen sosiaali- ja terveydenhuollon seuranta, Palvelujärjestelmän tutkimus -tiimi
Hyvinvointivaltion tutkimus ja uudistaminen -yksikkö, THL

4B-2 Kanssa- ja puolesta asioinnin ammatilliset ja eettiset haasteet digitaalisissa sote-palveluissa

Piia Silvennoinen, yliopettaja
Laurea ammattikorkeakoulu

4B-3 Mielenterveyden ongelmat ja niiden vaikutus digitaalisten sote-palveluiden käyttöön

Birgitta Tetri, asiantuntija, Laurea
Laurea ammattikorkeakoulu

4B-4 Videopuheluiden käyttö ikääntyneiden hoivatyössä

Ville Mustola, väitöskirjatutkija, CoE AgeCare
Jyväskylän yliopisto

5 min rapid scientific presentations

O-19 Work Ability Data Management in Multisectoral Services for People with Disabilities

Sari Nissinen[1], PhD, Erja Sormunen[1], PhD, Nina Nevala[1], PhD
[1]Finnish Institute of Occupational Health

O-20 Registered nurses' assessments of a health / client information system after implementation

Maiju Kyytsönen[1], MHSc, Anu Kaihlanen[1], PhD, Kaija Saranto[2], PhD, Ulla-Mari Kinnunen[2], PhD, Tuulikki Vehko[1], PhD
[1]Finnish institute for health and welfare
[2]University of Eastern Finland

O-21 Nurses Advancing Telehealth

Claudia C Bartz
[1]International Society for Telemedicine & eHealth

Väestökyselyn tarjoama näkymä sosiaali- ja terveydenhuollon digitaalisten palveluiden käyttöön: ketkä jäävät ulkopuolelle?

Maiju Kyytsönen, sh, TtM, väitöskirjatutkija, Digitaalisen sosiaali- ja terveydenhuollon seuranta, Palvelujärjestelmän tutkimus -tiimi
Hyvinvointivaltion tutkimus ja uudistaminen -yksikkö, THL

Biography Maiju Kyytsönen

Monitoring digital social welfare and health care from the perspectives of the population as well the professionals and service system is her work at Finnish institute for health and welfare. Acts as a doctoral researcher at University of Eastern Finland focussing on the information security skills and privacy concerns of the population and how they are associated with digital social welfare and health care service use.

Introduction: The digital transformation of social welfare and healthcare has increased the range of digital services for citizens. Since 2019 digital services have been strategically set as the prime contact channel to public administration [1]. At the government formation talks in 2023 the Ministry of Social Affairs and Health suggested that digital services could take precedence over phone calls and physical visits also in social welfare and healthcare [2]. At these times of change, a risk exists that some people are left behind, even though digitalization could be harnessed for creating a more equal service system.

Material and Methods: This abstract aims to compile an overall picture of who the non-users of digital social welfare and healthcare services are and who experience need for guidance in using these services. Answers are sought from articles and (statistical) reports that have been published of three cross-sectional and one longitudinal population survey data by Finnish institute for health and welfare. The National survey of health, well-being, and service use from 2017 [3] and 2020 [4-7] and the Healthy Finland survey from 2022 [5] cover adults aged 20 years or more. The formulation of the question of needing guidance was suggested by MK to the 2020 and 2022 surveys. Older adults and digital service use were defined as the subject areas of the longitudinal data: FinHealth 2017 and 2020 [9]. All data sets provide statistical weights for analysis. The Inverse probability weighting corrected results are representative in terms of age, sex, marital status, education level, area, and native language.

Results: In 2022 36.5% of service users had used digital services to communicate with a social welfare or healthcare professional, while the percentage was 25.8 in 2020 [5]. Guidance in digital social welfare and healthcare services was needed by 18.4% in 2022 [4]. Non-use of digital social welfare and healthcare services and needing guidance in using the services was more common among older adults and those whose education level was low [4-5]. Non-use of digital services was more common among those who experienced one's state of health as good and did not have a long-term illness [6]. Non-use was also connected to poor digital skills, needing guidance in using digital services, and activity limitations (e.g., poor vision and cognitive impairment) [6,8]. Good digital skills can help avert age-related decline in digital service use up to around 80 years [3]. Experiencing activity limitations (e.g., trouble hearing a conversation or walking 1 km) was also connected to needing guidance in digital social welfare and healthcare service use. Guidance was most often needed by those who did not use digital services or who used digital services with help or by proxy. [7] Those who had not been referred to digital services used digital services less often [6].

Discussion: The results indicate that digital social welfare and healthcare services do not adequately serve the needs of the oldest senior citizens and adults with a low education level, poor digital skills, or activity limitations. Needing guidance in digital social welfare or healthcare services is common, especially among those who do not use digital services independently. Therefore, the digital service designs should better consider different user types. Strategic work is needed to support the task, which is easier said than done. Concrete recommendations might ease the task, e.g., using a diverse group of people in testing the services or providing two or more versions of the service designed for people with different needs. If no measures are taken, unequal opportunities in using digital services will remain as part of the service system.

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Kanssa- ja puolesta asioinnin ammatilliset ja eettiset haasteet digitaalisissa sote-palveluissa

Piia Silvennoinen, Principal lecturer
Laurea ammattikorkeakoulu/ Laurea University of Applied Sciences

Biography Piia Silvennoinen

Dr. Piia Silvennoinen works as a principal lecturer at Laurea UAS. She also acts as a docent in Adult Education at the University of Turku. She is a head teacher for the Master's Degree Programme in Management and Development in Social and Health Care Reform. Currently she is working as a researcher and developer in DigiIN (www.digiin.fi) (2019-2025) and DigiOn (2021-2023) projects. Both projects focus on how to support vulnerable groups with the use of digitalized services. Her research interests focus on the competence requirements digitalization poses for social and health care professionals and on the digital agency of vulnerable groups. She is interested in how to prevent digital marginalization both at the individual and societal level.

The new professional and ethical challenges of social and health care professions created by e-services – the professionals as the proxy users and the clients as users-by-proxy

The increase of number of e-services in Finland has altered the role of the client profoundly. The implicit assumption is that the clients of social and health care can use the e-services independently, ie. they are self-sufficient and possess the needed digital skills and resources [1]. However, as research indicate, there is a risk that e-services will increase the digital exclusion of the vulnerable groups [2,3]. Especially people belonging to vulnerable groups need assistance when using e-services [2,3].

Due to this development, the social and health care professionals have encountered new professional and ethical challenges. Since the clients belonging to vulnerable groups often need assistance with e-service, the professionals need to ponder how to help the clients according the ethical and professional guidelines of their work. The social and health care professionals find themselves more often in situations in which their aim of guiding the client to use e-services independently turns into doing on the behalf of the clients. The professionals perform activities for the clients as proxy users and clients are users-by-proxy, the ones for whom the activities are performed [4]. The development has increased workload and ethical stress of the respective professionals [3].

The challenges created by digital by default society for the clients and thus, for the professionals need to be acknowledged and addressed. We need more encompassing discussions, guidelines and solutions of the consequences of digital by default society on social and health care professionalism and on ethical principles.

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Mielenterveyden ongelmat ja niiden vaikutus digitaalisten sote-palveluiden käyttöön

Birgitta Tetri, RDI specialist
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Biography Birgitta Tetri

She is currently working as an R&D specialist at Laurea University of Applied Sciences on projects related to digital competencies among vulnerable groups. Her background is in health care, and before joining Laurea UAS, she worked as a nurse manager in Helsinki University Hospital's medical ward.

Digitaaliset palvelut ovat yhä keskeisempiä sosiaali- ja terveydenhuollon alalla, mutta samalla mielenterveyden haasteet saattavat vaikuttaa merkittävästi näiden palveluiden hyödyntämiseen. Mielenterveyden ongelmat voivat muodostaa oireryppäitä, jotka heikentävät moniulotteisesti yksilön toimintakykyä. Ahdistus, masennus ja sosiaalisten tilanteiden pelko vaikuttavat kykyyn käyttää digitaalisia palveluita. Esimerkiksi henkilöt, joilla on vaikeuksia keskittyä tai joilla on pelkoja teknologiaa kohtaan, saattavat kokea digitaalisten sote-palveluiden käytön hankalaksi tai jopa mahdottomaksi. Etenkin masennukseen liittyy motivaatio-ongelmia ja tuolloin ylipäätään hoitoon sitoutuminen on haastavaa. Joskus luottamuksellisen hoitosuhteen muodostuminen etäasiointiin vaatii edeltävästi kasvokkaisia kohtaamisia asiakkaan/potilaan kanssa. Digitaalisten palveluiden on oltava saavutettavia ja helppokäyttöisiä, jotta ne ovat käyttökelpoisia myös mielenterveysongelmista kärsiville henkilöille. Tarjoamalla matalan kynnyksen digitukea ja ohjausta palveluiden käytössä eri toimijoiden taholta, tavoitetaan tukea tarvitsevat. Eettisestä näkökulmasta erityisesti yksityisyyden suoja ja tietoturva vaativat osaamista, kun annetaan tukea digitaaliseen asioimiseen.

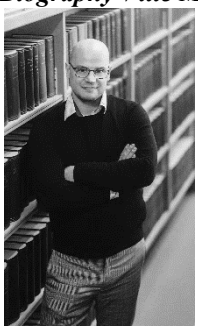
Mental Health Conditions and Their Impact on the Utilization of Digital Healthcare and Social Welfare Services

Digital services are becoming increasingly central in the field of healthcare and social welfare; however, concurrently, challenges related to mental health may significantly impact the utilization of these services. Mental health conditions can give rise to clusters of symptoms that comprehensively affect an individual's functional capacity. Anxiety, depression, and social anxiety can influence the ability to engage with digital services. For instance, individuals who struggle with attention deficit issues or possess technological fears might perceive the use of digital healthcare and social welfare services as cumbersome or even unfeasible. Particularly, depression is associated with motivation problems, making overall treatment adherence challenging. Establishing a confidential therapeutic relationship in remote services sometimes necessitates prior face-to-face encounters with the client/patient. Digital services must be accessible and user-friendly to render them feasible for individuals coping with mental health problems. By providing easily accessible digital support and guidance for service utilization from various stakeholders, those in need of assistance can be reached effectively. From an ethical perspective, expertise in privacy protection and cybersecurity is particularly imperative when offering support for using digital services.

Videopuheluiden käyttö ikääntyneiden hoivatyössä

Ville Mustola, väitöskirjatutkija, CoE AgeCare
Jyväskylän yliopisto/University of Jyväskylä

Biography Ville Mustola



MSc Ville Mustola works as a doctoral researcher in the Centre of Excellence of Age and Care, funded by the Academy of Finland, at the University of Jyväskylä. His PhD research focuses on the use of videoconferencing in care of older people from care workers' perspective. He has master's degree from Social and Public Policy and a wide variety of work experience as a nurse from different fields of social services and healthcare.

The purpose of this study is to examine how care worker-related factors – namely age, education, perceived ICT support, interest in technology and ICT skills and possible prior experience of using video conferencing tools – are related to the perceived benefits and drawbacks of video conferencing in the care of older people. Our data source was the second wave (2021) of the University of Jyväskylä survey on elder care work (N = 3,607) collected from four large trade unions in Finland. We used a multinomial logistic regression to group respondents according to their experiences of technology use and a path analysis to estimate the effects of care workers' characteristics and prior experiences on the perceived benefits of video conferencing tools in eldercare work. We found that personal characteristics of a care worker are associated with both the use of video conferencing and with its perceived benefits and drawbacks. In addition, we discovered that the prior use of video conferencing tools, especially in direct care work, affects the perceived benefits of them. Those who have used video conferencing in direct care work perceive them as more beneficial for both their own work and for the client.

O-19: Work Ability Data Management in Multisectoral Services for People with Disabilities

Sari Nissinen[1], PhD, Erja Sormunen[1], PhD, Nina Nevala[1], PhD
[1]Finnish Institute of Occupational Health

Introduction: In Finland, various services, means, and benefits are available to support the work ability (WA) and labour market participation of people with disabilities, in which management of WA data has been seen as one of a prerequisite to provide multisectoral services for people with disabilities [1-4]. Notably, since information exchange between professionals has been shown to positively impact WA promotion and supporting return-to-work efforts after sick leaves. However, this fragmented multisectoral service system poses challenges for professionals. [5] Therefore, it is necessary to identify the information needs of professionals and how WA data can be made accessible to them [6]. Although no previous studies were found on the experiences of professionals in social and health care and employment services regarding the use of WA data to support people with disabilities, Nissinen et al. [7] have described the utilization of WA data in occupational health services, highlighting its importance also for other professionals. The aim of this study was to describe the needs, availability, and acquisition of WA data in health care, social services, and in employment services, and to explore differences between these service sectors.

Material and Methods: This cross-sectional survey was conducted in spring 2021 with permission from 23 social and health care centres and eight employment service in Finland. We received 218 completed questionnaires. The respondents' professions were doctors, nurses, physiotherapists, psychologists, social workers, and employment officers who do health checks for the unemployed persons (health care services) or support WA and employment (social and employment services). The descriptive analyses were performed, and the frequency and percentage distributions were calculated for each service sectors of the respondents. Pearson chi-square test was used to examine the differences between the service sectors.

Results: The findings indicated that self-perceived health status data of clients were more commonly available compared to self-perceived WA data. However, data related to previous work accommodations (such as modified work time, work tasks or working environment), and current needs for these were found to be the least frequently available. When assessing the need for WA data, most respondents reported taking the initiative to discuss WA with clients always or more often, highlighting the significance of WA data in their work. Moreover, medical statements and documents provided by clients were identified as the most frequently used methods for obtaining WA data. The variations were observed in the results among different professionals.

Discussion: Social and health care services have been integrated in Finland in the beginning of 2023, aiming to enhance support for WA and employment of working-aged individuals. Improving employment outcomes, particularly for people with disabilities, is also one of the national objectives of the Finnish Government. To achieve these goals, professionals play a crucial role in identifying individuals at risk of losing their WA, assessing their needs, providing support, and coordinating care, rehabilitation, and return-to-work plans. However, the overall assessment of work disabilities is not always comprehensive, necessitating comprehensive access to WA data for professionals to ensure the best possible outcomes for their clients. We concluded that identifying the WA data needs and enhancing data exchange among all professionals related to WA support, we can improve the identification of WA issues and promote collaboration among professionals for the benefit of the people with disabilities.

References:
References are available from the authors

O-20 Registered nurses' assessments of a health / client information system after implementation

Maiju Kyytsönen[1], MHSc, Anu Kaihlanen[1], PhD, Kaija Saranto[2], PhD, Ulla-Mari Kinnunen[2], PhD, Tuulikki Vehko[1], PhD
[1]*Finnish institute for health and welfare*
[2]*University of Eastern Finland*

Introduction: Health information systems and client information systems (in short: IS) are relevant in the daily work of registered nurses (RN) and a change in the main IS can be a big upheaval in their professional life. Many wellbeing service counties that started operating at the beginning of 2023 faced the problem of overlapping IS solutions of which the life cycle of some ISs is coming to an end. The challenges of information exchange between different ISs and the cost of maintaining multiple overlapping solutions increase the pressure for reducing the number of ISs. During these times of change, decision makers and leaders need information on how the implementation of a new IS is reflected in the assessments of RNs over time.

Material and Methods: This study aims to describe RNs' assessments of the IS they mainly use and to examine whether the assessments vary depending on how much time has passed since implementation of the IS. Lifecare, which is used in both social and healthcare services, was selected as the focus of the study since the study sample contained enough respondents in all groups of interest. The assessments of the IS were based on the question: On a scale of 4 (fail) to 10 (excellent) how would you rate the electronic health record/ client information system Lifecare that you mainly use (computer version)? Question on the timing of the IS implementation included the answer options: within the past six months, within the past 12 months, and not within the last 12 months. Data analysis included descriptive statistics and ANOVA.

Results: The survey was answered by 888 RNs who used Lifecare and did not work in a leadership position. The mean grade for the IS was 7.3 (95% CI 7.2 to 7.4, n=713) among RNs whose workplace had implemented Lifecare at least 12 months ago. The mean grade was 6.9 (95% CI 6.7 to 7.2, n=94) when implementation had occurred within the last 12 months and 6.8 (95% CI 6.5 to 7.1, n=81) when it had occurred within the last six months. According to Levene's test the equality of variances was not assumed (p=0.005) and therefore Games-Howell's test was selected for post-hoc analysis of the differences between the three groups. Statistically significant differences were detected between the groups whose implementation was within the last six months and at least 12 months ago (p=0.003) as well as between the groups within the last 12 months and at least 12 months ago (p=0.030).

Discussion: The mean grade of Lifecare was 0.5 higher among those RNs whose workplace had implemented the IS at least a year ago compared to those whose workplace had implemented the IS within the last six months. Although the difference was statistically significant, the practical significance of the difference does not seem high. This study examined the assessments only in the timeframes of within six/12 months and at least 12 months ago. The assessments might have been notably lower if they had been given in the first weeks after implementation; at a time when most if not all users are new to the IS and are actively learning to use all the necessary functions of the IS in actual clinical work. Furthermore, the study does not answer to the question whether the assessments also improve consistently after 12 months of implementation. The comparisons made in this study do not consider possible differences of Lifecare in different organizations. Neither are other factors that influence the assessments of an IS (e.g. technical stability, summary views) examined in this preliminary study. The results cannot straightforwardly be generalized to the implementation of other ISs, which may for example require a more profound transformation in the workflows of RNs or which execute a different strategy for forming a change order and installing updates to the IS. To conclude, the implementation of Lifecare is not reflected as significantly lower grades within six months of implementation compared to the implementation having taken place at least 12 months ago. The results are encouraging to wellbeing service counties that are facing the need of implementing a new IS to the area's service producers. On the other hand, RNs seem to form a solid perspective on the IS within the first six months of its' implementation highlighting the importance of a successfully led implementation of an IS.

O-21: Nurses Advancing Telehealth

Claudia C Bartz[1], PhD, RN
[1]*International Society for Telemedicine & eHealth*

Introduction: Nurses are everywhere in healthcare but the articulation of what they do, exactly, is often difficult to describe or considered unimportant. Similarly, there is a lack of information about how nurses are involved in telemedicine and eHealth. The purpose of this paper is to describe what nurses do in a telehealth environment, whether independently or collaboratively. Given the millions of nurses working worldwide, it would be logical to anticipate that nurses would have a very broad impact on healthcare that makes use of information and communication technologies to improve care quality and outcomes in many different countries.

Materials and Methods: Throughout 2022, iterative reviews of health-related journals by a medical librarian resulted in 654 telehealth-related papers, of which 63 were nurse-as-first-author papers. All of the papers were English language. The papers were reviewed for the source country, design (research or narrative), modality of telehealth used, target population, and topic.

Results: Sixteen countries were represented in the sample. Fourteen papers were quantitative research, 14 papers were reviews - from literature reviews to systematic reviews with meta-analyses, 2 were studies of APPS per se, and 33 were narrative papers such as quality improvement projects. Using the authors' words, modalities of telehealth included telehealth, tele- (mental health, nursing, critical care, medicine, pain, video, wound care & monitoring, rehab, coaching, consultation). Also, virtual- (care, education, visits, community with WeChat), mobile health, mobile health APPs and smart phones. Digitally-led health care and digital- (tech, innovation, systems) were used rarely and digital clinical trials appeared just one time.

Every physiologic body system was represented in the 63 papers, also diabetes, cancer, palliative care and mental health were represented. Populations included those with physiologic pathologies, children (often with parents) to elders, care givers, marginalized and underserved people (racial and ethnic minorities, rural dwellers, frail elderly). Two sets of papers serve here as examples of what nurses are doing in telehealth. Five papers concerning diabetes included [1] a description of using tele-video to navigate diabetes, [2] a quality improvement project using telehealth for education of diabetics in rural areas about self-management, [3] a monthly telehealth visit using a quality improvement protocol to improve diabetic outcomes, [4] a 12-week RCT using a smartphone diabetes self-management protocol, and [5] a scoping review of mobile health literature on gestational diabetes. Five papers about caregivers described [1] a study of family care givers who made virtual visits with family members in long-term care, [2] use of the WeChat virtual community option to allow peer support of carers of people with dementia, [3] a scoping review on the topic of rural elders caregivers, [4] a systematic review and meta-analysis of telehealth interventions (psychoeducational and behavioral interventions) for people with dementia and their care givers, and [5] a pilot RCT of a phone-based behavioral activation for sleep quality of dementia care givers.

Discussion: This review of 2022 literature demonstrates the great diversity of nurse involvement in telehealth and its manifestations. Health care systems, hospitals, clinics and communities all have nurses doing research, quality improvement projects and knowledge dissemination for telehealth. This is a very encouraging phenomenon given that telehealth/digital health will continue to be a major foundation for health and wellness in the years to come. A limitation of this review is that only English papers were used. Another limitation may be that there were fewer papers submitted and published due to the pandemic, when nurses and all providers were working even more than usual hours in care delivery.

References: Available on request.

Sessio 5A: Data Security and Protection

Chair: Paresh Rathod, Senior lecturer, Laurea University of Applied Sciences

Perjantai 13.10.2023- Friday 13th of October 2023

11:00–11:50

5A-1 The current cyber security issues in health and social care in 2023

Petri Tolonen Cyber Security Specialist
KPMG Oy

5A-2 Resilience Management Framework for Critical Information Infrastructure: Designing the Level of Trust that Encourages the Exchange of Health Data

Jyri Rajamäki, Principal Lecturer
Laurea University of Sciences

5 min rapid scientific presentations

O-22 Factors associated with information security awareness among physicians and registered nurses: A comparative cross-sectional study

Emma Kainiemi[1], RM, MNSc, Tarja Heponiemi[1], PhD, Jarmo Reponen[2], MD, PhD, Kaija Saranto[3], RN, PhD, Tinja Lääveri[4,5], MD, PhD, Tuulikki Vehko[1], PhD
[1]Finnish Institute for Health and Welfare, Finland
[2]Research Unit of Health Sciences and Technology, University of Oulu, Finland
[3]Department of Health and Social Management, University of Eastern Finland, Finland
[4]Department of Infectious Diseases, University of Helsinki and Helsinki University Hospital, Finland
[5]Department of Computer Science, Aalto University, Finland

O-23 Assessing Information and Cybersecurity Training Needs among Social- and Healthcare Professionals

Tiina Blek[1], MSc (Health Sciences), Jaana Mäkelä[2], MSc (Health Sciences), Tytti Solankallio-Vahteri[1], D.Sc. (Econ. and Bus. Adm.)
[1]Jamk University of Applied Sciences, School of Health and Social Studies, Department of Healthcare
[2]Jamk University of Applied Sciences, School of Health and Social Studies, Research and Development

O-24 E-leadership in nursing – a systematic review

Vanesa Numanovic[1], PhD-student, MHSc, RDH, Julia Jacobsson[2], PhD-student, MHSc, RN
[1]University of Vaasa, Finland
[2] University of Eastern Finland, Finland

The current cyber security issues in health and social care in 2023

Petri Tolonen Cyber Security Specialist
KPMG Oy

Biography Petri Tolonen

Petri Tolonen has had a long career in information technology, information systems and information security. In the early stages of his career, he worked as an application developer and database specialist. Later, he moved to project management positions, responsible for larger ICT projects. Petri has worked in the healthcare industry for 15 years, with interests in healthcare information security, function-specific criticality classification, eHealth and digital services. Petri works at KPMG Oy, responsible for healthcare cybersecurity services. Petri has a master's degree in health sciences.

The healthcare sector has faced a significant number of incidents last years. The European Union Agency for Cybersecurity, ENISA tells us in their report (Enisa Threat Landscape: health sector, from January 2021 to March 2023) that most of the incidents in EU affected healthcare providers (53 %) and especially European hospitals (42 % of the total incidents). Ransomware is one of the prime threats in health sector (54 % of total threats). Geopolitical developments and hacktivist activity increased the number of DDos (attacks against availability) attacks against hospital and health authorities in early 2023, reaching 9 % of total incidents in EU.

Attacks on healthcare supply chain and service providers has caused disruptions or losses to organizations in healthcare and it appears to be a growing threat in the future. We need to develop our supply chain and create more cybersecure end-to-end operating model to ensure the functionality of the health and social services.

Due to increasingly professional attacks, wee need to protect against cyber threats more and more effectively to protect hospitals and other healthcare facilities from cyberattacks to ensure patient safety, business continuity, protection of confidential data and compliance with healthcare regulations.

Resilience Management Framework for Critical Information Infrastructure: Designing the Level of Trust that Encourages the Exchange of Health Data

Jyri Rajamäki, Principal Lecturer
Laurea University of Sciences

Biography Jyri Rajamäki

Jyri Rajamäki is a Principal Lecturer in Information Technology at Laurea University of Applied Sciences and Adjunct Professor of Critical Infrastructure Protection and Cyber Security at the University of Jyväskylä, Finland. He holds D.Sc. degrees in electrical and communications engineering from the Helsinki University of Technology, and a PhD in mathematical information technology from the University of Jyväskylä. His current research interests are resilient cyber-physical systems and overall governance (generation, transmission, storage, processing, sharing, collective use, deletion) of safety-critical and/or classified information. Dr Rajamäki has authored more than 220 scientific publications.

Background: Our safety and security thinking has been based on the supposition that inside defensive walls we are safe. The focus of our actions has been the control of our own systems, the improvement of the protection, and staying inside the protection. However, nobody can control complex large integrated cyber-physical systems (CPSs), but on the other hand, coordination and cooperation are needed. In eHealth and eWelfare, this means that the focus is moved from the control and securing of health and welfare information in a silo towards utilizing this information to promote health and well-being [1]. On the other hand, we have an urgent need to complement the existing knowledge base of safety and risk management by developing frameworks and models enabling network-wide resilience management that strives for maintaining and improving critical functionalities.

Material and Methods: The Relevance Cycle of this Design Science Research [2] connects the contextual environment (the eHealth domain) to the design science activities and the research problem of changing the mental image from ‘threat, crime, attack’ to ‘trust’ and ‘willingness to share’. The Rigor Cycle combines the scientific foundations, experience, and expertise of design science with the Knowledge Base database. The scientific foundations consist of cyber security science [3], cyber resilience concepts [4], building trust in the digital world [5], situational awareness in cyber systems [5], and experiences and expertise from lessons learned in the Horizon2020 projects SHAPES, ECHO and SAFETY4RAILS. The central Design Cycle iterates between the core activities of building and evaluating the design artifacts and processes of the research.

Results: A CPS consists of three perspectives: technology, information, and social. Every resilient CPS consists of two sub-systems: the operational system, and the cognitive situational awareness system which is the main prerequisite towards cyber security and resilience. The resilience management framework presented here includes five levels: security management, security technologies, security information, cognitive situational awareness, and a resilience management plan. A complex CPS is a system of systems, in which technology layers compose a physical network, information layers compose a (big) data network, human layers compose a social network, and situational awareness systems - a network enabling shared situational awareness and a common situational picture when needed. Trust should be systematically built up at all layers and networks. The resilient physical network is the basis on which information sharing between different stakeholders could be created. However, the trust inside social networks quantifies the pieces of information that will be shared, - and with whom.

Discussion: The ongoing restructuring of social and health services in Finland requires the development of the eHealth systems and the services offered through them. The Digital Twin changes operating methods, and organizational boundaries and requires the cooperation of public, private, and third-sector actors in creating new services [7]. Strengthening digital expertise, functioning services, and updating processes are key to the successful introduction of digital services. With the principles of the platform economy, it is possible to make even better use of the many possibilities offered by digital technology, personalized data, and artificial intelligence. The same principle also applies to the security and resilience of cyber-physical systems, as cognitive situational awareness can be seen as the digital twin of a cyber-physical system. By developing scalable digital twins, the supply of health services, their quality and cost-effectiveness as well as security and resilience will improve.

Acknowledgements
The DYNAMO project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101069601.

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O-22: Factors associated with information security awareness among physicians and registered nurses: A comparative cross-sectional study

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Introduction: Advances in information technology and the use of electronic health records (EHR) has facilitated the exchange of patients' health information [1]. Simultaneously organizations' dependence on their digital infrastructure is accompanied by rising cybersecurity threats and challenges [1–2]. External threats can jeopardize the essential operations and patient safety as well as endanger the health information of patients [3]. This has emphasized the importance of information security and protection of the information [2]. Healthcare professionals' awareness on external threats to the data is essential in securing the information and organizations' operations [3]. The aim of this study was to describe the level of self-perceived information security awareness among healthcare professionals and to examine which factors related to EHR are associated with perception of high information security awareness.

Material and Methods: A tailored questionnaire was sent to physicians and registered nurses in January-March 2021 [4] and March-April 2020 [5], respectively. The respondents were asked to rate on a 5-point Likert-scale their level of information security awareness [6]. Descriptive statistics were used to describe the self-perceived level of awareness among the professionals. Binary logistic regression analysis was used to examine which factors related to EHR (number of sign-ins, self-perceived user proficiency, user proficiency in years, satisfaction with the primary EHR) were associated with higher awareness of the professionals. Interactions were examined to discover possible differences between physicians and registered nurses. All the analyses were adjusted for age, gender and working sector (public, other).

Results: The study included 8 024 professionals (n= 4 572 physicians, n= 3 452 registered nurses). The majority of physicians (68.3%) and registered nurses (83.1%) perceived their awareness as high. Registered nurses had greater odds for higher awareness compared to physicians (OR 2.63, 95% CI 2.33–2.97). Professionals who perceived themselves as experts in the use of EHR (OR 1.54, 95% CI 1.36–1.74) or had used their primary EHR for at least one year (OR 1.33, 95% CI 1.19–1.50) had greater odds for higher awareness compared to less experienced EHR users. Professionals who rated their satisfaction with their primary EHR high had greater odds for higher awareness compared to their less satisfied counterparts. No differences were found in associating factors between physicians and registered nurses.

Discussion: Organizations' cybersecurity and training practices play an important role in achieving high information security awareness among professionals. Information security topics should be included in the curricula of students and organizations should introduce new employees for cybersecurity measures. Cyber threats change, so constant training is necessary to ensure that the professionals are aware of the potential threats to information security.

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O-23: Assessing Information and Cybersecurity Training Needs among Social- and Healthcare Professionals

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Introduction: Securing information systems assets has become a top priority for organisations in order to protect them from malicious attacks. Both the cyber-attacks and data breaches have increased dramatically in recent years. A significant number of organisational information security incidents are due to exploitation of human elements. [1]

This study aimed to explore the educational needs and preferences regarding information and cybersecurity training among social and healthcare personnel. The survey was part of a broader study on information and cybersecurity competence and education needs of social- and healthcare sector.

Material and Methods: A structured questionnaire was distributed to approximately 3,500 participants working in specialised and primary health care organizations. The discretionary sample was designed in collaboration with the target organizations. The survey was conducted between autumn 2020 and spring 2021. A total of 383 people responded to the survey. The majority (51 %, n=194) of respondents worked in nursing positions. 12% (n=45) of respondents worked in medical positions and 10% (n=39) in managerial positions. Around a fifth (18%, n=70) of respondents were in the "Other, which?" -category. This group included, for example, social care and rehabilitation professionals. The data was analysed using data analysis tools from the Webropol survey program. Open responses were used to supplement and illustrate the results. Further analysis of the data is ongoing.

Results: Data analysis revealed that while a majority of respondents felt adequately skilled in information and cybersecurity (78%), there were specific knowledge gaps related to outsourcing of services, hardware and software purchases, the EU General Data Protection Regulation, and information influencing. Furthermore, 38% of participants reported receiving training on protecting against malware, while only 44% believed the current training in information and cybersecurity was sufficient. The study highlights the need for enhanced training programs, with 84% of respondents expressing a desire for more information security, data protection, and cybersecurity training. Additionally, respondents emphasized the importance of group discussions and addressing these issues in work communities and department meetings. Online training was preferred over face-to-face training, and additional information by email was requested.

Discussion: These findings underscore the necessity of developing organizational strategies to promote cyber threat awareness and offer comprehensive training to healthcare professionals. By addressing the identified knowledge gaps and adopting interactive training methods, healthcare organizations can improve their cybersecurity posture and effectively mitigate cyber risks. Participants expressed the wish that information and cybersecurity issues would be discussed more in work communities. They also wanted these issues to be discussed in department meetings. This result supports Khan's [2] study, which found that group discussion is the most effective way to develop information and cybersecurity skills.

The study was carried out as part of the HealthCare Cyber Range (HCCR)[3] project. The project was completed in 2019–2021. The project was coordinated by Jyväskylä University of Applied Sciences and funded by the European Regional Development Fund (ERDF). The project developed the cybersecurity expertise of health care as well as the cybersecurity exercise of health care actors.

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O-24: E-leadership in nursing – a systematic review

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Introduction: Nurse leaders have complex role and responsibility profiles hence they can be considered e-leaders. Nurses and nurse leaders are in a central position in healthcare digitalization [1]. Empirical research on e-leadership in nursing is limited. To our knowledge this paper is the first systematic review on e-leadership among nurse leaders. Our purpose is to synthesize and describe existing research knowledge on e-leadership in nursing and to identify gaps in research knowledge.

Material and Methods: We conducted a systematic literature review. We searched databases CINAHL, Scopus, Web of Science, PubMed, Business Source Premier and Medic. The search yielded 1968 records. We excluded 656 duplicates and 1125 records by title, and we read 187 abstracts. We read 51 full texts and resulted in 12 records of which we screened all the reference lists and detected one relevant record. Finally, we identified 13 records in total. We assessed the quality of the included studies utilizing the Quality Assessment for Diverse Studies (QuADS) tool [2]. We applied the framework for conducting systematic reviews by Holly et al. (2021). [3].

Results: More than half of the included 13 publications were from the Nordic countries, others were from Australia, the USA, the Philippines, and Israel. Three main themes were identified: i) interpersonal relationships, ii) e-leadership and coping and iii) readiness to e-leadership and remote work. The main themes included 12 subthemes. Aspects of interpersonal relationships included team spirit, attitudes [4], communication [5, 6, 7] and need for physical presence. Leaders identified many positive aspects by utilizing digitalization and by working remotely as well as disadvantages regarding work well-being. Work efficiency increased, while accessibility was experienced differently by employees and leaders. Available, well-functioning IT-equipment is important [4]. Leaders perceive IT-systems as useful [4], but they seem not to identify their IT-system needs thus they use IT-systems narrowly. Leaders emphasize the need for training and time to become familiar with constantly new technological solutions. Organizations lack policy on remote work and structures regarding e-leadership. The COVID-19 pandemic quickened the shift to remote work and e-leadership [7]. Resistance to change decreased and had a positive effect on attitudes.

Discussion: The findings indicate a readiness for e-leadership among nurse leaders. There are several advantages but also many disadvantages regarding e-leadership in nursing. Nurse leaders need sufficient training in e-leadership since digitalization is progressing in health care.

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Session 5B: Yhtenäinen terveys (OneHealth)

Chair: Paula Veikkolainen, LL, DI, Oulu University

Friday 13th of October 2023

11:00 – 11:50

5B-1 One Health ja eläinterveydenhuollon digitalisaatio

Eva Kaisti, Veterinarian, Founder and CEO
vetsy® Oy and Veteva Oy

5B-2 Suun terveydenhuollon rekisteritieto ja tiedon hyödyntäminen

Ulla Harjunmaa, Chief dentist
Finnish Institute for Health and Welfare (THL)

5 min rapid scientific presentations

O-25 Dental selfies for e-assessment of oral diseases

Katri Kukkola[1], Msc (Tech.), Msc (Econ.), Elina Väyrynen[2], DDS, Saujanya Karki[2], PhD, DDS, Laura Pentti[2], DDS, Ville Kaikkonen[1], Msc (Tech.), Eero Molkoselkä[1], Msc (Tech.), Marja-Liisa Laitala[2], PhD, DDS, Prof.
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O-26 Attitudes and capabilities of medical students towards eHealth and digitalization: a repeated cross sectional study in 2016–2022

Paula Veikkolainen[1], Timo Tuovinen[1,2], Erika Jarva[1], Jonna Juntunen[1], Petri Kulmala[2,3], Anna-Maria Tuomikoski[1,2], Merja Männistö[4], Jarmo Reponen[1]
[1]Department of Paediatrics and Child Health, Red Cross War Memorial Children's Hospital,
[2]University of Cape Town, Cape Town, South Africa.

O-27 Registered Nurses assessments Kanta services in their perspective of their work

Tuulikki Vehko[1], PhD
[1]Finnish institute for health and welfare

One Health ja eläinterveydenhuollon digitalisaatio

Eva Kaisti, Veterinarian, Founder and CEO
vetsy® Oy and Veteva Oy

Biography Eva Kaisti

Eläinlääkäri Eva Kaistilla on ainoana eläinlääkärinä maailmassa Terveydenhuollon Tietotekniikan Erityispätevyys. Lisäksi hän on suorittanut tarkastuseläinlääkärin sekä elintarvikehygieenikon erityispätevyydet.

Evan ura terveydenhuollon tietotekniikan saralla alkoi, kun hän 2018 luotasi projektipällikkönä Petmeddata-järjestelmän, lohkoketjupohjaisen "Eläinten OmaKanta-järjestelmän". Eva on perehtynyt eläinterveydenhuollon digitalisaatioon sekä etäeläinlääketieteeseen ja luennoinut aiheesta mm. Madridin eläinlääkäripäivillä 2019, Suomen eHealth konferenssissa 2021 sekä Suomen eläinlääkäripäivillä 2022. Evalla oli tieteellinen posteri 2022 eHealth konferenssissa aiheesta eläinlääkemääräykset etäklinikoilta.

Eva yritys Veteva Oy on jo 4,5 vuoden ajan tuottanut etäeläinlääkintäpalveluja ja sovelluskehittämistä. Edelleen Eva toimii ajoittain itsekin etäeläinlääkärinä ja omistaa Helsingissä oman pieneläinklinikan Vetsy, jossa tekee pieneläinpraktiikkaa

Suun terveydenhuollon rekisteritieto ja tiedon hyödyntäminen

Ulla Harjunmaa, Chief dentist
Finnish Institute for Health and Welfare (THL)

Biography Ulla Harjunmaa

Ulla Harjunmaa works currently as Chief dentist at Finnish National Institute for Health and Welfare. She is a dentist specialized in dental public health. She also holds PhD and MSc in health sciences (International Health). She has extensive experience in oral health research, public health development, University education and clinical dentistry in Finland and in several African and Asian countries. In her current position at Finnish Institute for Health and Welfare, se is leading the expert teams that are developing the oral healthcare information structures and the national quality register for oral diseases treatment, that utilizes register data. She is also actively involved in national surveys and other research projects concerning oral health and diseases and oral health care systems.

Almost everyone experiences oral diseases at some point in their lives. The responsibility for organizing oral health care services in primary and specialized care lies with the wellbeing services counties. Private oral health care services complement public services.

Visits and treatment information in oral health care are recorded and stored in patient information systems using standardized structures, which enable versatile utilization of data. The National Institute for Health and Welfare (THL) serves as the statistical authority and is responsible for the planning, guidance, and monitoring of national data resources and classifications. The required data structures for patient information systems, which are utilized in the processing of patient documents, are distributed from THL's code service server. All essential patient care information is defined as structured content.

Patient information in oral health care is archived nationwide in The Treatment Notification System (Avohilmo and Hilmo registers) and the Patient Data Repository and the Archive of Imaging Data of the social and health care services (Kanta services). Additionally, the Social Insurance Institution of Finland (Kela) collects information on procedures eligible for health insurance reimbursement.

The Avohilmo and Hilmo registers contain data from public oral health care providers, while the submission of data to the Patient Data Repository is mandatory for both public and private service providers. The Patient Data Repository provides real-time information about patient visits regardless of the care provider, enabling functional care pathways, reducing duplicate examinations, increasing efficiency, and improving the quality and safety of care. Patients can also access this information through the "Omakanta" service.

The collected register data describe the content, availability and provider of services, and reasons for using them. These data can be aggregated and analyzed both locally and nationally e.g. for decision-making, planning, resource allocation, reporting, scientific research, regulatory oversight, and national and international benchmarking and comparisons (so-called secondary use). The procedure classification (toimenpidekoodisto) serves as the basis for procedure-specific user fees in primary health care and for private oral health care reimbursements. THL publishes several statistical reports based on the Avohilmo data, along with specified indicators on the Sotkanet and Sotekuva services annually. In the future, the Kanta data in oral health care can also be utilized in national reporting.

THL is responsible for developing the quality register on Treatment of oral and dental diseases. It will report indicators based on data concerning treatment quality, outcomes, effects, and patients' reported experiences on their treatment. THL will publish this information online and organize peer development sessions to review the results and consider ways to enhance treatment quality.

In summary, the effective utilization of registry data in oral health care can lead to improved patient outcomes, enhanced care quality, and informed decision-making across the healthcare spectrum. It enables healthcare providers, policymakers, researchers, and patients to work collaboratively towards a healthier population.

O-25: Dental selfies for e-assessment of oral diseases

Katri Kukkola[1], Msc (Tech.), Msc (Econ.), Elina Väyrynen[2], DDS, Saujanya Karki2, PhD, DDS, Laura Pentti[2], DDS, Ville Kaikkonen[1], Msc (Tech.), Eero Molkoselkä[1], Msc (Tech.), Marja-Liisa Laitala[2], PhD, DDS, Prof.
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[2]Research Unit of Population Health, Faculty of Medicine, University of Oulu, Finland

Background: Dental caries and periodontal diseases are the predominant non-communicable diseases affecting 3 billion people [1]. There is growing evidence on the ability of mobile phone images in diagnostic of oral diseases [2, 3]. Challenges of the image quality impact their usability for diagnosing, but information is limited how it affects the whole dentition analysis [4]. Our aim is to analyse if dental selfies are capable of supporting e-assessment of oral diseases.

Material and Methods: Altogether 771 dental photographs were taken with mobile phone from participants (n=170, 112 13-17-year-old adolescents and 58 adults) attending our pilot test of a web-based risk assessment tool during 03/2022-05/2022. Each participant took photographs from five directions: a front view, a left lateral view, a right lateral view, a lower occlusal view and an upper occlusal view. All participants got short guidance to take the images, and most, but not all images of adolescents were taken by a trained dentist or a technician. The images were analysed in a two-tier process. In the first round, dentists (N=6) evaluated overall image quality either poor or acceptable and quality of each visible tooth in the acceptable images were classified as good, moderate, or poor for their diagnostic ability. On the second tier, experienced dentists (N=4) drew areas of findings and classified them. The drawn findings included caries, hypoplasia, plaque, calculus, erosive tooth wear, gingivitis, gingival recession, fillings, orthodontic and other appliances. In the preliminary report capability to detect the findings is assessed qualitatively.

Results: Obtaining good quality dental selfies is a challenge for virtual oral services. In the sample 24.8 % of the images were judged as poor-quality on the first analysis tier. Adults were more critical for the images, 27.6 % of adult participant did not give all images, but 80.1 % of the received images were acceptable while 72.6 % of the images of the adolescents were considered acceptable. Diagnostic ability was analysed for 6841 teeth, and it was found good for 49.4 %, moderate for 23.8 % and poor for 26.8 % of the teeth. The most common reasons for the poor quality were being out of focus/fuzziness (69.8 %) and soft tissue obstruction (31.8 %). These and other image quality issues like overexposure, shadows and saliva on tooth surface impeded visual diagnostics from the images. Gingivitis and its irritations plaque and dental calculus, hypoplasia and hypomieralisation, erosive tooth wear as well as amalgam and composite filling were easy to detect from the images. Caries lesions on approximal surfaces or under fillings and secondary caries lesions often remained undetected. If there was plenty of plaque, it would cover other findings beneath. Other challenges in image-based diagnosing were differentiating gingivitis and parondontitis and assessing the depth and activity of a caries lesion and thus the class of caries.

Discussion: Dental selfies support virtual appointments. They could be used for example to screen treatment urgency and guiding for better self-care. All dental details cannot be seen from images, but to achieve full capability solutions to solve image quality issues, support for focusing and correct lightning, are needed.

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O-26: Attitudes and capabilities of medical students towards eHealth and digitalization: a repeated cross sectional study in 2016–2022

Paula Veikkolainen[1], Timo Tuovinen[1,2], Erika Jarva[1], Jonna Juntunen[1], Petri Kulmala[2,3], Anna-Maria Tuomikoski[1,2], Merja Männistö[4], Jarmo Reponen[1]
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[2] Medical Research Center Oulu (MRC Oulu)
[3] Medical Faculty: University of Oulu, Finland
[4] Oulu University of Applied Science, Oulu, Finland

Background: Digital transformation has reshaped the health care sector in a profound level [1]. Modern health care systems around the world are facing challenges with aging population, increasing prevalence of chronical diseases other live style associated conditions. At the same time countries are facing shortages of health care workforce especially in rural areas [2]. Digitalisation is seen as one way to face these challenges and strengthen the health systems both in national and global levels [3–4]. The attitudes of health care professionals are connected to the digital competence levels and professionals' perceptions of their own digital health competence [5]. Health care students and medical students find the learning of digital health important to their future careers [6]. The aim of this study was to analyse how the attitudes and capabilities of medical student towards eHealth and health care digitalisation have shifted in years 2016–2022.

Material and Methods: 5th year medical students were invited to participate to an online survey in spring 2016, 2021 and 2022 at the University of Oulu in Finland. The survey questionnaire consisted of seven background questions and 16 statements on a five-point Likert scale (fully disagree to fully agree) to survey student attitudes towards eHealth and their digital capabilities. The Likert scale question were re-categorized into dichotomous scale. The categorical variables were presented using frequencies and percentages and were further tested by using Pearson's chi-square test. P-value less than 0.05 was considered as statistically significant.

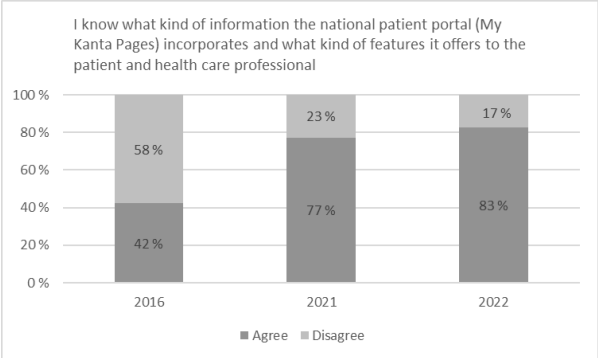

Figure 1. Comparison of students' knowledge of information contained in the national patient portal. The p-value is <= 0.00001.

Results: The study included a total of 215 medical students (n = 45 in 2016, n = 106 in 2021, n = 64 in 2022). Students generally had a positive attitude towards the usage of patient-generated information and the role of applications in patient care. Students valued that the basic education of health care professionals should prepare them to deploy digital health technologies. There was a statistically significant shift in students' knowledge of information contained in the national patient portal (Figure 1). The attitudes towards how digitalization affects health promotion also shifted during the follow-up period.

Discussion: The results of the survey questionnaire can be used for the future eHealth education curriculum planning among basic education of medical students. The results indicate that students find the learning of digital health important to their future careers and this has not changed during the follow up period.

References: References are available from the authors

O-27: Registered Nurses assessments Kanta services in their perspective of their work

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Intrduction: The Kanta Services are available to public and private healthcare services, social welfare services, pharmacies, and users. This national information technology infrastructure is based on legislation. [1] In this study, we describe how registered nurses (RN) assess and what kinds of experiences they have on using Kanta Services in their work. We tie the findings to Clinical Adoption Meta-Model (CAMM) which consists of four dimensions (availability, use, behaviour, and clinical outcomes) that emerge successively over time. The CAMM dimensions indicate suitable measurement points in different situations: when a data system becomes available, it is used, and when the use leads to changes in behaviour that eventually produce clinical or health outcomes [2, 3, 4]

Material and Methods: The Survey on Information Systems for Registered Nurses was sent by the Finnish Nurses Association and the Union of Health and Social Care Professionals in Finland (Tehy) to their members in April 2023. A total of 2 970 RNs, midwives, and public health nurses responded. The professionals used healthcare information systems (HIS) or social care information systems in their daily work. The data were analysed by using descriptive methods, e.g. direct distributions and cross-tabulations with Pearson's chi-square test. Outcome variables (defined by MK, TV) applied a 5-point Likert scale (1= fully disagree – 5= fully agree) including an option 'not applicable to my work'. We report the proportion of those who fully or somewhat agreed to the statements. Due to non-response, the number of observations varies slightly.

Results: Half (48%) of the professionals (n=2 970) worked at public hospitals, 26% at public health and social services centres 11% in private sector, 6% in social welfare, and 9% in other working environments. A third (33%) of the professionals (n=2 955) agreed that Kanta Services are easy to open through the information system that they use. However, there were differences between the working environments: the highest proportion (47%) was among professionals working at health and social services centres, whereas the proportion was 30% for RN working at hospitals, 25% in private sector, 18% in social welfare, and 28% in other working environments ($p<0.001$). Every third (31%) professional (n=2 949) assessed that client or patient information they needed in their work was available through Kanta Services. The proportions varied between working environments ($p<0.001$) (43% at health and social services centres, 29% at hospitals, 26% in the private sector, 15% in social welfare and 24% in other working environments). A smaller proportion, approximately every fifth (19%) (n=2 950), assessed that they can easily find the information they need in Kanta Services. Also these proportions varied between working environments ($p<0.001$) (29% at health and social services centres, 17% at hospitals, 10% in the private sector, 13% in social welfare and 17% in other working environments).

Discussion: Preliminary results suggest that a user-friendly interface of Kanta Services, availability of the needed client or patient information on Kanta Services, and the findability of necessary client and patient information on Kanta Services are currently best realized among RNs working at health and social services centres compared to RNs working in other environments. Further studies will focus on how working environment, HIS brand and self-perceived proficiency in using information systems are associated to the assessments. To conclude, Kanta Services, if used, have potential to support the work of RNs, and enable Finnish healthcare service system to reach for one's part established objectives for better clinical and health outcomes.

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Workshops

Perjantai 13.10.2023 - Friday 13th of October 2023

12:00 – 13:00

The workshops aim at providing participants deeper knowledge of eHealth and telemedicine product development in testbed environment. This is also opportunity for networking, discussion, and knowledge sharing.

Note: Language in the workshops is English if there is a non-Finnish speaker in the workshop.

Timetable for workshops

12.00-12.10 Introductions and instructions for the workshop

12.15-12.30 Table 1 discussions

Switch tables

12.35-12.50 Table 2 discussions

12.50-13.00 Summary

Workshop agenda

Each workshop will start with a short introduction from the organizers. Each workshop will be hosted and facilitated with two or more experts on the topic and with the help of students from Laurea University of applied sciences.

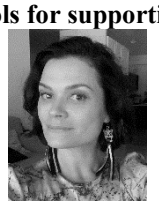
Workshops will be facilitated by World Café Method which is a structured conversational process for knowledge sharing. Groups of people discuss a topic at small tables like those in a café. Some degree of facilitation and formality may be retained to make sure that everyone gets a chance to speak. Pre-defined questions have been agreed upon beforehand with the hosts, but the outcomes or solutions are not decided in advance.

WS1: Regulation and ethical aspects of medical devices (Lääkinnällisiin laitteisiin liittyvä regulaatio ja eettisyyskysymykset)


Sandra Liede, Healthtech Finland/Terveysteknologia ry Annika Takala, HUS, User point of view
Questions in the workshop
How can risks and unintended adverse consequences of medical devices be identified, mitigated and reported?

WS2: Preventive digital tools for supporting healthcare workers wellbeing





Virtually participating: Dr Manon Truchon (Ph.D. in psychology), professor at the School of Psychology at Laval University, Quebec.
Virtually participating: Dr. Mahée Gilbert-Ouimet (Ph.D. in epidemiology), associate professor in population health, Department of Health Sciences, Université du Québec à Rimouski.
Laura Tahvanainen, RDI Specialist Laurea UAS, Wellbeign to Healthcare ESF-project

Questions in the workshop
What should we do next with the data that the digital solutions are producing in terms of prediction?
How to enable employer participation/engagement in development processes?

WS3: International cocreation with testbeds


Katariina Rouvinen, Health Proof Helsinki
Riikka Paasikivi, Spinverse Oy, Business Finland

Questions in the workshops
How can a company in testbed environment collect references in Finland before the globalization?
What are the experiences of companies within the HUS testbed about expanding from Finland to global markets?

WS4: Roadmap to transnational and interorganizational collaboration among Health Care innovation ecosystems (European Network of Living Labs (Enoll))

Teemu Santonen, Principal lecturer, Laurea UAS
Questions in the workshops
Evdokimos I. Konstantinidis MSc, PhD Medical Informatics Electronics Engineering European Living Lab Network)

WS 5: What testbeds can offer and what is needed from the companies? (Mitä testbedit tarjoavat ja mitä yrityksiltä vaaditaan? Minkälaisia asioita yrityksen tulee huomioida tuodessaan yrityksensä tuotteen testbed ympäristöön.)


Mervi Vähätalo, coordinator of Satakunta Testbed
Niina Holappa, project manager, Satakunta Testbed, Prizztech Oy

Questions in the workshops
How should the testbed services be developed from companies' point of view?
What kind of co-operation would be beneficial for wellbeing and health technology to be adapted to the field?

Session 7: Future Visions (of Digital Health and Welfare)

Chair: President Outi Ahonen, Finnish Society of Telemedicine and eHealth

Friday 13th of October 2023

14:00 – 15:00

6-1 Population Health and Preventive Care

Ilkka Kunnamo, Development Director
Duodecim Publishing Company Ltd/EBMEDS

6-2 AI standardisation related to health informatics

Alpo Värri, tutkimusjohtaja/Research Director
Tampereen yliopisto/Tampere University

6-3 Finnish Society of Telemedicine and eHealth closing words

President Outi Ahonen
FTeHS

Population Health and Preventive Care

Ilkka Kunnamo, Development Director
Duodecim Publishing Company Ltd/EBMEDS

Biography Ilkka Kunnamo

Ilkka Kunnamo, MD, PhD, born 1955, founded Evidence-Based Medicine Guidelines, a comprehensive electronic guideline database first published in 1989 by Duodecim Publishing Company Ltd., Finland, and translated into 11 languages. He is adjunct professor of general practice at the University of Helsinki, and a practicing primary care physician. He develops a comprehensive multilingual decision support service (EBMEDS, https://www.ebmeds.org/en/) utilizing coded data from electronic health records and providing patient-specific reminders, interactive algorithms, smart questionnaires, and population health tools. In 2014 - 2018 he served as chair of the WONCA (World organization of family physicians) Working Party on eHealth.

Interoperable electronic health record (EHR) data cumulated over years, available directly from EHRs or from a national eHealth register, can be combined with computerized clinical practice guidelines and computable evidence. The health status and quality of care can be measured in any defined population and longitudinally followed. Furthermore, individuals with care gaps and risk factors can be proactively identified and contacted by health care professionals who are responsible for their care. Equity in health is promoted, and resources can be used for people who benefit most.

AI standardisation related to health informatics

Alpo Värri, Dr. Tech tutkimusjohtaja/Research Director
Tampereen yliopisto/Tampere University

Biography Alpo Värri

Dr.Tech., Adjunct professor Alpo Värri is a research director in the Faculty of Medicine and Health Technology in Tampere University, Finland. His research and teaching have been related to pattern recognition applied to physiological signals. He has been involved in nationally and European Union funded projects in this domain since the end of the 1980'ies. He joined the technical committee TC251 Health Informatics of the European Committee of Standardisation in 1994. Later, he has participated health informatics standardisation in ISO/TC215, and IEEE 11073, too. He has also participated artificial intelligence standardisation in JTC1/SC42 and CEN&CENELEC/JTC21 having sometimes been the head of the Finnish delegation in some of these committees. His experience in standardisation has brought him educational tasks in the areas of health informatics standardisation and regulations in Tampere University.

Background

The European Union (EU) has the intention to regulate artificial intelligence (AI) in a manner that is aligned with European values and supports innovation in the AI sector in the EU [1]. The AI Act alone is not going to define every detail relating to the development and use of AI systems. The details will be expressed in so-called harmonised standards that will be designed to match with the requirements of the AI Act. The European Commission (EC) has issued a standardisation request to the Joint Technical Committee 21 of CEN and CENELEC (JTC 21) to prepare these standards (target: April 2025) [2]. There are also other standardisation bodies working on AI standards, also for the health sector.

Standards supporting the EU AI Act

The EC standardisation request lists the following topic areas for which standard documents are to be drafted:

1. risk management systems for AI systems
2. governance and quality of datasets used to build AI systems
3. record keeping through logging capabilities by AI systems
4. transparency and information provisions for users of AI systems
5. human oversight of AI systems
6. accuracy specifications for AI systems
7. robustness specifications for AI systems
8. cybersecurity specifications for AI systems
9. quality management systems for providers of AI systems, including post-market monitoring processes
10. conformity assessment for AI systems

These standards are so-called horizontal standards, applying to all sectors of the society. The standards are to be applied particularly to "high risk AI systems" defined by the AI Act, including, for example, medical devices. If a health information system applying AI is classified as an AI system with a limited risk, the requirements are significantly lighter. The standardisation request reminds also about the widely approved UNESCO recommendation on AI ethics agreement [3].

AI Standards for the health sector

Although it would be easier for the AI developers if the horizontal AI standards could be applied directly in all industries, some sectors may find it necessary to produce sector specific AI standards. Some health informatics standardisation organisations have started working on AI standards, too. AAMI and BSI published a guide how to apply the risk management standard ISO 14971 for AI [4]. The Focus Group on Artificial Intelligence for Health (FG-AI4H) is a partnership of ITU and WHO with the aim to provide an assessment framework for AI used in healthcare [5]. IEC/SC62A has drafted a roadmap of its future activity in medical device related AI standardisation. HL7 has a focus team on AI discussing what topics might be relevant in health AI for HL7 to address. Some of the IEEE AI standards are targeted specifically to the health care sector. The ISO/TC215 Health Informatics has established a joint working group with the JTC1/SC42 Artificial Intelligence for health-related AI standardisation work. CEN/TC251 Health Informatics and JTC 21 aim at closer contacts in future, too.

Discussion

The AI Act related horizontal standards by JTC 21 will be relevant for the health sector to recognize. Additionally, health informatics standardisation organisations will make available standards which can be useful for the health sector.

References

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POSTERS

P-1: Enhancing workplace wellbeing and work ability of Finnish professional heavy vehicle drivers Vireeksi-project

[1]Merja Ala-Kotila, MSc (Econ), [1]Antti Kotimaa, PhD
[1]Savonia University of Applied Sciences, Finland

Introduction: Professional heavy vehicle drivers require good physical condition and mental health to effectively perform their work. Irregular working hours and extended periods of sitting are among the main factors affecting drivers' ability to maintain a healthy lifestyle. These health-related problems often lead to early disability pensions, high levels of sick leaves, musculoskeletal disorders, and mental health issues. Additionally, drivers experience sleep and recovery problems, which impact their alertness on the road. To tackle these health-related problems among the professional heavy vehicle drivers, Savonia University of Applied Sciences was granted an ESR-funding for the Vireeksi-project for the period of 01.02.2020–30.4.2023.

Aim of the project: The primary goal of the Vireeksi project is to enhance the overall wellbeing and work ability of heavy vehicle drivers residing in the North Savo region of Finland. Specifically, the project aims to share knowledge on how healthy living including nutrition, ergonomics, physical exercise, sleep, and recovery are connected to the overall work ability and wellbeing of drivers engaged in demanding shift work. Furthermore, the project emphasizes practicality and takes into consideration the participants' hopes and expectations, goals, and limitations. Approximately two hundred drivers from 17 different organizations and transport sectors were selected to participate in the project. Savonia University of Applied Sciences coordinated the project together with Savo Vocational College. The project's novelty lies in utilizing various wellbeing technologies to promote the adoption of healthy lifestyle. The drivers had the opportunity to use measuring instruments and applications such as Firstbeat and Polar to measure sleep, recovery, and exercise. The Firstbeat measurement tool monitored drivers' stress and recovery levels using heart rate variability (HRV), while the Polar sport tracker watch supported their exercise habits and overall daily activity levels. Additionally, drivers underwent other measurements, including InBody body composition measurements and assessments of muscular strength.

Results: Vireeksi-project was a successful project from several aspects. Firstly, the main target was to increase drivers' overall wellbeing and ability to work efficiently. Participant feedback collected at the end of the project indicated that 76% of the participants perceived a significant increase in their overall wellbeing and work ability. This positive shift resulted from the participants' daily lifestyle changes, such as paying more attention to nutrition, sleep and recovery, and sports and exercise. Furthermore, individual participants reported positive changes in their lifestyle routines, as evidenced by improvements in Firstbeat and other wellbeing measurements. Secondly, the project aimed to increase drivers' knowledge regarding healthy lifestyle, including nutrition, exercise, sleep, and recovery. Almost all participants stated that hands-on experiences, such as trying new sports activities and adopting healthy cooking practices, were instrumental in gaining new knowledge and skills. Thirdly, the project's novelty was highlighted by the utilization of wellbeing technology to support drivers in achieving their goals. The majority of participants provided highly positive feedback on the user-friendly Polar sport tracker. While some found the Firstbeat HRV measurement tool slightly complex, overall results indicated an increase in physical activity and improved sleep patterns.

Discussion: The next phase of the project involves further developing the capacity of transport sector organizations to support their workers' work ability. Specifically, attention will be given to leadership and daily management practices within these organizations to foster effective work-wellbeing management among drivers. Small and medium-sized transport sector organizations, in particular, require support as the ongoing world crisis has impacted their ability to invest in such initiatives.

P-2: Technologies and digital services in the support services for living at home

Mika Fiskari, BSc, Anni Virtanen, Master of Health Care, RN
[1]*Western Uusimaa Wellbeing Services County, Espoo, Finland*

Introduction: Future services supporting living at home for the elderly project [1] (TKA project) is part of Finnish Health and social services reform [2]. As of 1 January 2023, the Western Uusimaa Wellbeing Services County provides health, social and rescue services as well as the school psychologist and social services for the residents of Espoo, Hanko, Inkoo, Karkkila, Kauniainen, Kirkkonummi, Lohja, Raasepori, Siuntio and Vihti. Municipalities had very different levels of technology usage in homecare. Technologies and digital services project was started as part of TKA project to report on the status of digital services in different municipalities and to plan and execute a way to maximize the usage of technologies in homecare services especially remote homecare and medicine-dispensing robots. The project started March 2022 and is set to finish December 2023.

Aim of the project: Social and health care services in Finland are facing problems in having enough professional nursing staff and at the same time the population is growing older [3]. It has been recognized that telehealth services and medicine-dispensing robots can free employees time for face-to-face patient time. The aims of the project were to introduce these technologies to municipalities that didn't already use them, expand their usage heavily and have common practices and guidelines when using technologies in support services for living at home. The project has the aim to have over 700 medicine-dispensing robots in use and over 600 homecare patients in remote homecare. The project provided support to other project that were focusing on remote rehabilitation and remote rehabilitative day activities for the elderly.

Results: In 3 of 10 municipalities the medicine-dispensing robots were not in use. For example, in Raasepori and Espoo, the usage of medicine-dispensing robots has rapidly grown during the project. In June 2022 there were 156 medicine-dispensing robots in Western Uusimaa and in May 2023 there were 474, so a 3-fold growth in a year. Telehealth and remote home care has been more difficult to expand. The project has been involved in procuring telehealth services and helping form functioning networks inside our welfare county to bring together the employees producing remote homecare.

Discussion: During the project it has been apparent that medicine-dispensing robots are easier to deploy as they free homecare services resources more evidently. Remote homecare relies on building robust logistics, support services and all-around processes how to begin, give and end remote homecare as a service to homecare patient. This is the main focus for the last 6 months of the project to produce a coordination model for digital services including remote homecare and medicine-dispensing robots. Remote rehabilitative day activities for the elderly seem to have positive outcomes in psychosocial capacity, decreasing loneliness and improving overall mood of the elderly.

References:

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P-3: Developing the programme structure: Master of managing the transformation to digital health – ManagiDiTH. Joint Master Program (EQF Level 7) by ISCTE, LAUREA, EISEE-UGE And AUTH

Maria do Carmo Gomes[1], Janet Smithson[1], Paulo Feliciano[1], Margarida Santos[1], João Carlos Ferreira[1], Octavian Postolache[1], Outi Ahonen[2], Panagiotis Bamidis[3], Olivier Français[4], Adrien Ugon[4]
[1]Iscte - Instituto Universitário de Lisboa (ISCTE),
[2]Laurea University of Applied Sciences
[3]Aristotele University of Thessaloniki (AUTH)
[4]École Supérieure d'Ingénieurs en Électrotechnique et Électronique (ESIEE, Paris) / Université Gustave Eiffel (UGE).

Introduction: The need to adapt to rapid technological change and take advantage of digitalisation of services [1] led to the development of a Master programme to facilitate specialised digital skills for the health sector. This programme has been designed by the Managinng Digital Transformation in the Health Sector (ManagiDiTH) project consortium, funded by the EC Digital Europe Programme (EC-HADEA Grant Agreement No. 101083896). University members of the consortium are Iscte - Instituto Universitário de Lisboa, Aristotele University of Thessaloniki (AUTH), Laurea University of Applied Sciences, École Supérieure d'Ingénieurs en Électrotechnique et Électronique (ESIEE Paris) / Université Gustave Eiffel (UGE).
The Master programme being developed in the scope of the ManagiDiTH project targets professionals that are involved or are willing to be involved in planning, coordinating, and implementing digital transformation processes in the health sector. These professionals belong to either **health** or **ICT** sectors. The knowledge and experience levels of potential students may vary in specific health topics as well as their background ICT profile and level of knowledge of related scientific areas. The students may have different levels of contact, usage experience and scientific knowledge of digital technologies and topics.
Aim: The project aim is to develop and pilot a Master's programme of specialised digital skills in the health sector. The goal is to manage the digitalization of health services.
Results: The Master programme has 3 main components: 1. Health sector skills; 2. Societal skills; and 3. Digital skills. The final programme structure is composed of 10 curricular units (6 mandatory and 4 optional) of 6 ECTS each (10 Units * 6 ECTS = 60 ECTS), plus the Dissertation/Project/internship unit (30 ECTS). In total, the Master programme counts for 90 ECTS. It has two possible branches in the Digital skills component that students may choose according to their interest, background profile and previous knowledge acquired on specific topics (pre-requisites for selecting and attending these units are specified for each Curricular Unit): 1. Data Science and 2. Interoperability.
The overall structure of the programme allows the different potential segments of demand from both health and ICT professionals target-groups to define the most suitable pathway according to their individual profiles. Students must attend all the mandatory units, and they have options of attending one of the two branches, and selecting the most appropriate Curricular Units among the optional ones according to their background professionals and level of ICT knowledge and use experience. There are also common CUs across the two branches that can be chosen as optional. This Master programme is intended to fill a gap in the current offer of Level 7 programmes in the EU context, since there are some advanced study programmes in the area of digital transformation and health management, but there is not yet a programme that brings together the three main fields covered by this master (health, societal and digital).
Discussion/what is happening next: The accreditation dossier for this Master programme is being submitted in the four universities. The project website has been launched at https://managidith.eu, and the Programme will open up student applications from across the EU this autumn. The start date for the first cohort of students will be March 2024. We are meanwhile working on aligning the programme with the IMIA competency framework [2] to support international accreditation.

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P-4: Establishing an Effectiveness Evaluation Model for Information Technology Services: A Case Study

Sanna Heikkinen1, MSc, M.Soc.Sc, Juhani Heikka2, MSc
[1] *Istekki Oy, Kuopio, Finland*
[2] *Istekki Oy, Oulu, Finland*

Background: Discussion about the effectiveness of social welfare and healthcare is active in Finland. National healthcare reform is aiming for cost savings requiring that healthcare treatments, including digital services or solutions, should increase cost efficiency [1]. However, there is no uniform method established in evaluation of IT services effectiveness. The Case organization is widely supporting digitalization of well-being services in county organizations and the realization of related national goals. With the IT services produced by the Case organization, it is thus possible to build valuable and effective digital solutions for social and healthcare's future needs. In the context of IT Service Management (ITSM) effectiveness can be defined by how well the set development goals are reached by utilizing IT services. In case organization's context, the effectiveness means that the IT service brings benefits such as: In the operations of the case organization and client organizations; In employees' efficiency and job satisfaction; In customer and patient healthcare services; In society, promoting the well-being of citizens and optimizing the use of public funds.

Aim the project: The aim of this project is to establish an Effectiveness Evaluation Method (EEM) for the case organization in the context of Information Technology Service Management (ITSM) and digital services. The qualitative research approach was used in this study. The design science research was selected as a research method [2]. Multiple sources of evidence (e.g., discussions, documents, and workshop observations) were used to study effectiveness evaluation activities [3]. The analysis method included a pattern matching technique related to ITSM practice of the case organization.

Results: The case organization started creating the EEM for effectiveness-based management in February 2023. Researchers chose the effectiveness viewpoints (safe, timely, efficient, and cost-effective) based on the WHO's quality viewpoints [4]. In addition, the EEM includes of four levels of evaluation: 1) organization, 2) professionals, 3) patients and 4) society. By utilizing these viewpoints effectiveness can be fulfilled on a wide scale. The first task in designing the EEM was related to the modelling of the impact chain of effectiveness and the need-based approach of the target groups. The second task was to identifying the effectiveness in case organization's ITSM processes. As a result, the researchers identified that IT services effectiveness can be evaluated in three phases: 1) Pre review evaluation (e.g., planning investment in innovative IT services; 2) Operational Information management (e.g., development of information management related to therapeutic protocol); 3) Post Implementation Review (e.g., demonstrating the benefits of continuous IT services). Through EEM the expected benefits and implemented changes of IT services improvement are measured to show positive impact on the selected target group. Evaluating the effectiveness of IT services supports information management helping the case organization to understand what kind of digital services are effective and what could be done differently (continual improvement).

Discussion: Designed Effectiveness Evaluation Method (EEM) answers the strategic need to collect effectiveness data to increase the current and future IT services improvement and impact of digital services more widely. The data collected with the EEM method is based on utilizing information from processes and thereby increasing positive benefits and effectiveness on a wide scale for client organizations, professionals, citizens, and society. Future research could focus on how to design practices and measurements in the each phase of the EEM or how the developed framework could be applied with wide range of digital solution combined with business intelligent or artificial intelligence technologies.

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P-5: Human-centric eHealth systems: A balanced design for bridging hearts and intelligent surfaces

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Introduction: This study emphasizes the urgency to embed human factors in developing autonomous healthcare systems. Insights from cognitive neuroscience, human factors engineering, and organizational psychology stress that these systems' development must prioritize interdisciplinary perspectives while addressing user-specific needs. A proposed decoupled framework ensures subsystem autonomy without sidelining the operator's emotional and cognitive demands. Advanced natural language processing and immersive training are milestones, but they should not diminish the primary focus: ensuring these systems embody human empathy and welfare before activation. This review encapsulates the vision for autonomous healthcare systems: a fusion of technology and humanity with patients and practitioners at its core. Recognizing team dynamics, mental health concerns, cultural differences, and the imperative for transparent design is crucial. For optimal benefits, the trajectory for these systems should lean on interdisciplinary expertise, with human welfare as its guiding star.

Background: Autonomous systems offer efficiency in healthcare but present human interaction challenges. Insights from neuroscience, human factors engineering, and psychology emphasize interdisciplinary, user-centric design.

Aims: This review identified key research questions on integrating autonomous systems into healthcare, analyzing literature on human-centric factors.

Method: A Scopus database search was conducted using targeted queries across disciplines. Results were analyzed for trends and perspectives.

Results: Findings stress optimizing human-system collaboration, safety, transparency, and performance through neuroergonomic principles. A proposed decoupled framework balances autonomy with users' cognitive/emotional needs.

Conclusions/Discussion: While promising, autonomous healthcare systems require balanced design fusing technology and human welfare. Future research should explore team dynamics, mental health, cultural differences, and immersive training. Emphasizing interdisciplinary expertise and human-centric factors is vital.

Keywords: Human oriented approach, eHealth, digital services, axiomatic design, neuroergonomics

P-6: Robota project promoting the adoption of technology in the social and health care sector

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Background: Finland's population will start to decline in 2031 and the proportion of working-age people in the population will decrease (Tilastokeskus, 9/2019). In 2020, there were a total of 110,722 nurses under the age of 65 (Nurses Association, 2020). As a result of the regulatory changes in the number of assigned nurses per patient it has been estimated that thousands of new nurses are needed in Finland. At the same time, the number of applicants to the field has decreased. How can we solve the equation where there is increasingly more work to be done than there are workers? According to a study by the University of Jyväskylä (2021), in the care sector, only three out of five days are spent on actual care work. According to research, by adding smart technology and automation to the health sector, one more day could be added to the actual nursing work. If such an increase of one working day were possible, it would theoretically increase the resources available for patient work by 20%. In its global strategy, the WHO (2020) has stated that health can be improved all over the world, for example by making digital health solutions available to all. Digitalization brings robotics and smart technology into everyday life in healthcare. At best, digital health and social services and nursing staff who manage digital services help support the client's participation and the success of treatment. (Nurses Association, 2021).

Aim of the project: The aim of the Robota project (2022–2023) has been to respond to the acute need to increase and improve the digital competence and preparedness of health and social services personnel for the rapid digital leap in society, implemented by Laurea University of Applied Sciences and South-Eastern Finland University of Applied Sciences XAMK. The project has investigated how robotization and digitalization are reshaping traditional work culture. The co-creation workshops examined themes such as easing workload, improving occupational safety and their effects on well-being at work, coping and improving productivity with the help of robotics and digital technologies. The project has created an overview of the latest robotics, smart technology, service, and robotic process automation operators operating in the health and social services sector.

Results: The result is an insight into the current level of digital skills of health and social services personnel and the current utilization of robotics in organizations in the health and social services sector. The most significant pilots were the mobile robot, MotoTiles exercise tiles, advanced interactive robots Paro and Nao in addition the Liftsuit lifting suit. In the wellbeing services county of Kymenlaakso pilots were conducted in three different kinds of environments. Pilots were performed in hospital, elderly care, day-to-day activities for intellectually disabled people units. The transport of flexible endoscopes was tested in equipment maintenance, where clean and dirty endoscopes should be transported, and the usability of a mobile robot and its ability to carry out a transport task from the other end of the hospital to the endoscopic unit were also validated. Social and therapeutic robots were used in varied tasks in recreational, exercise and therapy activities. The wellbeing services county of Central Uusimaa tested MotoTiles exercise tiles, which are suitable for developing motor skills and mobility for rehabilitees of all ages and levels. In addition, the Auxivo Liftsuit was tested, which is a wearable lightweight exoskeleton that supports the users' back muscles (Meditas, 2023, Auxivo Liftsuit ® 2023).
Discussion: Based on the views of the co-creation workshops, pilots, and trainings, it will be important in the future to increase the use of digital solutions and smart technology in the health and social services sector and to lower the threshold for their introduction.

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P-7: Client centered digital services developed by using service design process

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Introduction: Social and healthcare digital transformation requires a new kind of multidisciplinary expertise. For new career paths through digital-social and health care competences -project (UUDO), a 30-credit further education programme was produced: Multiprofessional in the development of the digitalization of the social and health sector. The key themes of the training were social and healthcare information management, development of digital services and service design. As part of the further education training, the participating professionals completed a 10-credit development work. Five credit service design module was provided as a part of curriculum for the professionals that prepared them for the development project. Service design process was applied to solve the digital challenges of real working life. All together 250 professionals developed 72 development projects in two implementation rounds of specialization studies. In this poster the solutions of service design are described.

Aim of the project: The aim of the project was to find solutions to organizations´ digital challenges and to develop client-centered digital services. In addition, the aim was to find out how suitable the service design process and methods were to use in solving the digital challenges in social and healthcare.

Results: Digital communication and co-operation with clients were the common themes in development projects where the solutions were related. For example, the client centered digital service paths and new digital service innovations were developed. All the development projects followed the service design process. The process consisted of four phases, client understanding, conceptualization, prototypes and assessment. Implementing service design in digital service development was a successful method to solve the working life challenges. Service design is a beneficial method when client centered solutions need to be found for digital development needs in organizations.

Participating professionals were widely represented different regions of Finland. They gave positive feedback of the development work process and they reported that their competences using the service design process in digital service development was increased. Competent guidance and support during all phases of the development process is needed and frequent meetings with the service design experts is needed. This was the important feedback from the participants to be strengthen in implementation in the future.

Discussion: The aim of the project was achieved. Professionals found solutions to organizations´ digital challenges and developed client-centered digital services. 72 development projects were published in the form of poster, and blog-text or article in the publication of UUDO-project in autumn 2023. Positive feedback was given to the implementation of service design methods. This information supports the usage of service design methods when developing social and health services. The professionals got new insights for development of digital services and user perspective of the services. Co-creation in organizations distributed service design methods also to colleagues of the professionals. Development project where the service design methods were implemented created added value for social and health care organizations. As the participated professionals represented different regions in Finland the good practices were shared widely, and all the participants benefitted of co-learning.

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P-8: Digital support prevents digital exclusion

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Introduction: Finland aims to develop transactions in social and health services more in electronic direction. This is a national goal, for example, in the Finnish Sustainable Growth Program coordinated by the Ministry of Social Affairs and Health. Digital and Population Data Services Agency has also proposed that transactions in public services become digital during the next government term. The legal background for the digital support provided by the authorities can also be found in several laws. Consequently, the service provider must offer help and advice for electronic transactions in order to electronic transactions be successful.

Aim the project: In the *Wellbeing services county of Vantaa and Kerava*, digital support has been piloted at Tikkurila Health Centre. The purpose is to bring digital support to where the customers already are. Tikkurila Health Centre has offered digital support primarily to those health services which are in use at this area, such as *Maisa, Omakanta* and *Kela.* The customers have mainly been elderly people. In the health centre pilot it became visible that there is two kind of needs. First of all, there is citizens' need for digital support and secondly, there is a need for a network within digital support providers.

There has been collaboration between Vantaa and Kerava for a couple of years. Within the collaboration there has been an idea of a new event where digital support is offered. That event has been designed in 2023 in collaboration with Laurea University of Applied Sciences, City of Vantaa, City of Kerava and Wellbeing services county of Vantaa and Kerava. The event is called *Digitukea senioreille* (*Digital support for seniors* in English).

Digitukea senioreille -event will be held on October 3, 2023 at Tikkurila campus of Laurea University of Applied Sciences, during the national Seniors' Week. Several organizations and other actors that offer senior activities or digital support will participate in the event. In addition, Laurea students participate in the event as part of their studies. The event also builds cooperation with Laurea University of Applied Sciences, whereby students benefit from working life cooperation. In that way the event strengthens students working life skills. Different entities can network at the event and thus build more effective digital support for citizens through cooperation.

The aim of Digitukea senioreille -event is to strengthen the elderly's independent electronic transactions and prevent digital exclusion. In order to transactions to be successful in digital channels, the services must be easy to use. In addition, users of the services must have sufficient skills to use the services.

Results: The event will strengthen citizens' skills in using the social and health services that are in use in the welfare area. This goal will be reached through the cooperation of several actors. In addition, the network-like cooperation of the welfare area is strengthened as well.

The event brings together peer groups, organizations, authorities, as well as educational institution staff and students. We present the results and experiences of the event with digital support in the welfare area of Wellbeing services county of Vantaa and Kerava.

P-9: Digital Care Path for Acute Heart Infarct Patients – A Digital Bridge Between Specialised Care and Primary Health Care

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Background: Acute Myocardial Infarct (AMI) is very common reason for a specialised care and hospitalisation in Finland. Acute care is well organized and recovery from the acute situation is quick so patients are discharged from the hospital the fastest after a few days. This might lead to a lack of understanding, that the coronary artery disease is a chronic condition which needs self-care and regular follow ups. [1]

Aim the project: The Digital Care Path for AMI includes information about coronary artery disease, secondary preventions aspects such as nutrition, exercise, and medication. Patient can contact the nurse on cardiologic unit via a built-in message service. Patient should fill out the blood pressure values on the path and after one month he/she should fill out a questionnaire about his/her condition and get needed blood samples taken. After one month nurse makes an overview of patient's outcomes and sends a message to the patient's accountable healthcare centre's nurse. The patient's care continues in the primary health care.
The aims of the Digital Care Path for AMI patients are to ensure secondary prevention and improve patient's follow up. The path is offered to all AMI patients who are a citizen of Helsinki, are treated on the cardiologic unit, and have willing and capability to use eHealth services. For the healthcare professional the path offers a new way of sharing information, contacting the patients, and contacting the healthcare professional who are going to take the responsibility for the patient's care after specialised care.

Results:
The Digital Care Path for AMI has been piloted since 2022 and from March 2023 it was taken to actual use. To this day, the number of users is approximately 40 patients. The main benefit has been ensuring AMI patients safe continuity of care by assuring that the information about the patient is transferred between specialized health care and primary health care. The patient has an opportunity to give feedback at the of the path, but this has still been rarely used. It has been noticed that the feedback questionnaire, which should be filled up by the patient at the latest after one month, is often left unanswered. This taking to consideration, there has been made small changes on the path to make the questionnaire more accessible.

Discussion/what is happening next: The Digital Care Path for AMI covers only Helsinki inhabitants, who are taken care at the Meilahti hospital in Helsinki University Hospital, HUS. The next phase is to make the path and its benefits known in other HUS areas and to offer education and support to the implementation of this service for healthcare professionals in other hospitals.

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P-10: Nurses' experiences of counselling a patient with coronary artery disease patients on the digital care pathway

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Introduction: The number of digital health services is increasing rapidly in Finland), and several healthcare programmes and reforms emphasise the importance of e-services in service provision[1]. According to WHO (2021), digital health services refer to methods that a health professional utilizes remotely, using information and communication technologies to prevent, research, and evaluate a patient's diagnosis, treatment, illness or injury to promote the health of individuals and communities. With digital care pathways, the nature of healthcare professionals' tasks will change, operating processes will become more diverse and work will be renewed when new working methods are used.[2]

Material and Methods: Data and methods: The data was collected through an individual thematic interviews of nurses (n=5) in 2021, working on a coronary artery disease patient's digital care pathway at a university hospital. The data was analyzed using inductive content analysis[3].

Results: Nurses experienced that the counselling of patients with coronary artery disease was on the digital care pathway. It confirmed the attractiveness of work, changed the work tasks of nurses and increased the expertise of nurses. According to the nurses, patients with coronary artery disease benefited from counselling on digital care pathway. That increased patients' adherence to care and was able to take into account the individual needs of the patients in the care of disease. The counselling skills of nurses also developed with the digital care pathway. On the digital care pathway counselling also involved development challenges, such as rules of multi-professional co-operation and patient-related challenges.

Discussion: The nurses assessed that the meaningfulness and expertise of the work will be strengthened counselled the coronary artery disease patient in the digital care pathway. In addition, counselling in a digital care pathway set new competence requirements for work, in order to implement high-quality of counselling for coronary artery disease patients. Multi-professional co-operation on patient counselling on the digital care pathway must be developed.

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P-11: Health care professionals' experiences of counselling competence in Digital Care Pathways – A descriptive qualitative study

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Introduction: The implementation of digital services challenges the skills of health care professionals. Health care professionals are tasked with the role of supporting patients in using eHealth services in their personal care and counselling competence in digital environments to ensure appropriate patient care.[1] They need a new kind of counselling competence when working on the Digital Care Pathways. Our aim was to describe health care professionals' experiences of counselling competence in Digital Care Pathways.

Material and Methods: A descriptive qualitative study was conducted. Interviews with semi-structured questions were conducted and twelve (n=12) health care professionals were interviewed. The data was analyzed using inductive content analysis. The results were reported according to the Consolidated Criteria for Reporting Qualitative Research. [2,3]

Results: The analysis revealed eight distinct areas of competence related to counselling in Digital Care Pathways, namely, (1) counselling competence related to the use of Digital Care Pathways, (2) supporting patients' self-care, (3) information technology competence, (4) competence in creating an interactive counselling relationship on the Digital Care Pathway, (5) information management, (6) ethical competence related to counselling in Digital Care Pathways, (7) competence to developing Digital Care Pathways services, and (8) change competence.[3]

Discussion: The study provides new information on which counselling competencies health care professionals need in Digital Care Pathways. Health care professionals play an essential role in the execution of counselling via Digital Care Pathways and in the continuous development of this service. In addition to self-care counselling, expertise in counselling regarding the use of the service is essential. This is a way to ensure the counselling will be delivered appropriately for the client. Professional expertise and digital competence are required when health care professionals provide counselling via Digital Care Pathways. Competence in fostering interactive counselling relationships and information management skills are also necessary in terms of patient-centered counselling. When discussing ethically challenging situations, the participating health care professionals emphasized interaction skills, the utilization of evidence-based information, and multidisciplinary competence. The development of Digital Care Pathways requires innovation and consideration of different user groups so the service can provide patients with the maximum benefits.[3]

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P-12: Sote-digiohjaaja project – Developing the digital counselling competence of social and health care professionals

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Background: The Covid-19 pandemic significantly accelerated the digitization of health care services.[1] After the formation of wellbeing services counties, social and health care professionals need a new kind of digital counselling competence to provide high-quality and patient-safe services.[2] The continuous development of digital counselling competence requires systematic educational and multidisciplinary cooperation between higher education institutions and working life. [3] The Sote-digiohjaaja project (funded by European Social Fund) meets the identified needs of social and health care professionals for digital counselling competence and cooperation in education and working life in the North Ostrobothnia wellbeing services county.

Aim the project: The Sote-digiohjaaja project is a working life-oriented project led by the University of Oulu. The goal is to develop and pilot an educational cooperation model to support the systematic development of digital counselling competence of social and health care professionals in Northern Ostrobothnia wellbeing services county. The project offers social and health care professionals' solutions for new types of digital counselling competence requirements and the societal need for continuous learning in working life. In addition, the project promotes cooperation between universities and working life.

Results: The operation and implementation of the project is divided into three work packages, which are closely related to each other. The purpose of work package 1 is to design and develop an educational cooperation model that increases digital counselling competence and the online course included in it for the competence needs of social and health care professionals. In work package 2, the working life-oriented online course aimed at social and health care professionals is being piloted and evaluated. Work packages 1 and 2 are implemented in cooperation with the functional partner of the project, the operators of North Ostrobothnia wellbeing services county. Work package 3 communicates and promotes the further utilization and propagation of online course for the development of digital counselling competence as counselling environments increasingly become digital.

The project develops online course that supports digital counselling competence, which can be used in the future to support continuous learning. In addition, systematic educational cooperation between universities and working life is being developed. The working life orientation and research-based nature of the project supports and promotes the digital counselling competence of social and health care professionals in the North Ostrobothnia wellbeing services county. The project produces scientific publications and organizes webinars for members of the target group and those interested in digital counselling competence.

Discussion: In the future, the online course developed in the project can be used for the continuous development of digital counselling competence widely, regardless of geographical boundaries, for social and health care professionals working in digital counselling environments. The project strengthens the multidisciplinary cooperation implemented in the wellbeing services counties, provinces, and municipalities to correct the challenges caused by the Covid-19 pandemic and to promote health.

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P-13: ARPA Project: Promoting Well-being of the Young with Smart Devices and Data

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Background: Well-being of the young in Finland has been deteriorating during the past few years due to Covid-19 pandemic following the war in Ukraine. ARPA project was founded to tackle the challenge by creating solutions with the young based on their own terms and preferred ways of living. An intrinsic motivation of the young is build based on possibility-driven design [1], which stems from the idea that when the young can use their strengths and creativity while creating a solution for themselves, they can flourish and drive, which in turn creates long-term sustainable solutions for the challenge. Therefore, the young are included in the development of the technical solutions and service models to promote well-being for the young.
The young are provided an opportunity to monitor and assess quantitative and qualitative data of their own well-being as well as learn ways to improve for example sleeping habits and factors impacting the sleep. The young can show the professionals working with the young their well-being data, which in turn can assist the professionals in their operative work to support the young. Moreover, anonymized data collected during the trial periods can assist organisational decision-makers when planning activities which touch on lives and well-being of the young.
Aim the project: ARPA project of Häme University of Applied Sciences aims to develop a digital and easily accessible technical solution as well as service and action models, which support well-being of the young based on their needs and preferred ways to ask for help from the professionals. The service and action models are developed in collaboration with the young based on principals and processes of possibility-driven design concept [2]. The trial participants are interviewed in the end of the trail periods.
The primary target group of ARPA project is 15-18 years old teenagers living in Hämeenlinna and Janakkala in Tavastia Proper region of Finland. The secondary target groups are families of the young and professionals working with the young. The trial periods are conducted mainly in local schools in collaboration with the teachers and study counsellors of the schools. The tertiary target group is Finnish small and medium-sized enterprises (SMEs), which have an opportunity to jointly develop digital tools and service models for the public sector. There are two companies providing qualitative and quantitative data and well-being expertise in the ARPA project. Moreover, collected anonymized data can act as a guiding tool for organizational decision-makers with matters concerning the young.
Results: There are four trial periods in the project. The first trial is seen as a pilot period, and the set-up of the following trial periods is modified based on observations, lessons learned and feedback from different target groups collected during and after the pilot. The following three trial periods are modified consequentially based on observations and lessons learned from the earlier trial periods as well as feedback collected in the interview sessions in the end of each trial. Content and functionalities of the mobile ARPA application, and the service and action models are developed further based on the feedback of the trial participants.
Concepts of ARPA mobile application, and its' service and action models are outcomes of the project.
The young and the professionals are embedded in interdisciplinary co-development work to learn about factors impacting their well-being and activities included in the development of digital solutions. The young are asked to use smart devices, such as smart watches, and do a self-evaluation test during their trial period, which increase their awareness of factors impacting their personal well-being. ARPA mobile application is installed temporarily into the mobile phones of the young for the trial period.
However, it is difficult to predict long-term impacts of ARPA project to the well-being of the young or ways of working of the professionals at this stage.
Discussion: In the end of the project, the ARPA mobile application will be at Proof of Concept (PoC) stage, and there will be plans to develop it into a commercial solution. The service and action models co-developed in the project can be implemented parallel to the mobile ARPA application.

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P-14: Artificial Intelligence-Based Sentiment Classification of Covid-19 Vaccine Tweets for Human-Centric Medical Information Systems

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I**ntroduction:** The advancement of artificial intelligence (AI) has revolutionized digital health [1], particularly in human-centric medical information systems. These systems aim to store, manage, and process health-related information for better decision-making. AI can assist in identifying and classifying medical information, misinformation, and fake news, especially in the context of a pandemic [2-4]. However, ensuring the accuracy of AI models for information processing in digital health remains a challenge [5]. Therefore, this study proposes an AI-based model for sentiment classification in digital health, specifically during pandemics. Additionally, an application is developed to display sentiment classification of tweets on a web-based medical information system.

Material and Methods: This study utilizes Covid-19 vaccine tweets as the main dataset. A hybrid deep learning model combining Convolutional Neural Network (CNN) and Long Short-Term Memory (LSTM) is proposed to improve the accuracy of Covid-19 vaccine sentiment classification on Twitter. The performance of the proposed algorithm is compared with other algorithms. Furthermore, an application is developed to automate the process of sentiment classification and is integrated into a web-based medical information system.

Results: Covid-19 vaccine sentiments are classified into three main groups: positive, neutral, and negative. The negative sentiment (labelled as 1) contains 5,224 tweets, the neutral sentiment (labelled as 2) contains 15,553 tweets, and the positive sentiment (labelled as 3) contains 12,923 tweets. The results show that the hybrid CNN-LSTM model outperforms other algorithms in terms of accuracy (94.20%), precision (95.80%), recall (94.20%), and F1-score (95%).

Discussion: The algorithm with the highest accuracy is selected for integration into the developed application within the medical information system. While this study focuses on Covid-19 vaccine sentiment classification, the proposed system can be applied to different types of digital health data. This study assists healthcare professionals, pharmacists, and the pharmaceutical industry in understanding users' opinions and expectations from healthcare providers during the diagnosis and treatment phases. The proposed model extracts social media data and converts it into useful information about the level of hesitancy and anxiety among the public towards new types of treatment. This information can aid healthcare industries and authorities in making informed decisions, particularly when introducing new treatments for various diseases.

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P-15: Digital-First Rehabilitation Model for Inclusive and Accessible Primary Health Care in Low-resource Settings

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Introduction: The World Health Organization (WHO) promotes rehabilitation as a 21st century health strategy of choice and considers it an integral tool in achieving Universal Health Coverage [1]. Rehabilitation targets individuals' needs and priorities in functioning in key life roles across the continuum of care and throughout the individuals' lifespan. Rehabilitation goes beyond just the health system [2], and includes education, social, livelihood and empowerment-related efforts. The need for rehabilitation has largely increased since the early 1990s and estimates indicate that at least one in every three people in the world needs rehabilitation at some point in the course of their illness or injury [2]. Thus, the demand for rehabilitation already exceeds availability, leaving a large unmet need especially in low- and middle-income countries (LMICs) [3] where most of the world population live [4]. Reversing health issues resulting from lack of or inadequate access to rehabilitation services enhances the well-being of the population and saves healthcare costs.

Aim the project: There is a common understanding among rehabilitation stakeholders in Rwanda and Kenya that the rehabilitation system needs re-thinking to meet the needs of the population. The present system does not scale and the speed of training and employing rehabilitation professionals is slow. There is also a limited number of studies in LMICs about using digital services in rehabilitation. Digitalization has had an enormous impact on different areas of the society and strategically leveraging digital services to address the needs of users directly and equipping different social and health systems with rehabilitation expertise could increase access. In many LMICs, community-based health is the primary level of the health care system for most of the population, especially those living in rural areas. Community-based health volunteers are an integral element for enhancing access to and continuity of health care services in many LMIC's making them a viable means to promote digital rehabilitation. However, integrating digital solutions into existing health systems requires an evidence-driven model to ensure successful implementation. Therefore, the primary aim of the project is to enhance access to rehabilitation by developing a digital-first rehabilitation model where services are accessible directly through the primary health care systems in Rwanda and Kenya. This includes increasing availability of feasible, appropriate, meaningful, and effective digital solutions for those who provide social- and health care services, and directly to those who need rehabilitation in different contexts.

Results: The preliminary results from interviews of patients and rehabilitation service users, physiotherapists and community health workers in Rwanda reveal the need for public advocacy, digital literacy and digital skills training and the efficacy of digital services in mitigating some challenges to accessibility of rehabilitation services. A pilot study of physiotherapists' perceptions of a digital rehabilitation solution provided by our project partner indicated physiotherapists' attitudes towards new technology, and the potential of such solutions to enhance efficiency, patient engagement, and their professional development.

Discussion/what is happening next: Based on the results of the first phase of the project, a tailored context-specific solution was developed, and testing of the solution with community health workers in Rwanda is ongoing. The intention is to get and analyze direct user data from the system in use, and to follow the same users for longer periods of time to better understand the long-term impact.

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P-16: A Gamified Mobile App for Enhancing Drug Calculation Skills in Healthcare Education

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I**ntroduction:** Patient malpractice resulting from false medical treatment remains a significant concern in healthcare facilities. To address this issue, high-quality education is crucial, especially in the field of healthcare. Digital tools and mobile apps offer agile and effective ways to enhance challenging areas of study. Gamified methods are recognized for their engaging and captivating nature, effectively fostering learning through repetitive practice.

Aim the project: We developed the game specifically designed to improve drug calculation skills. This makes the difficult, but compulsory education exciting, easy, fun, and accessible anywhere. The content of the game was designed together with experts and lecturers that teach drug calculations. The technical development was outsourced to ensure a seamless user experience. The game was launched in February 2020 in the Google Play and in the App Store. In this abstract we present the main user data analytics gathered from the Google Play store, focusing exclusively on this platform.

Results: Within the first month of its release, the game gathered nearly 3000 users. Since its launch on the Google Play store alone, over 12,500 active devices have downloaded the app. Currently, there are approximately 3000 monthly active users, with the game receiving an average rating of 3.79 on Google Play.

Feedback from users has been largely positive, with the game being described as both fun and educational. However, some negative feedback has been received, primarily relating to technical issues and bugs arising from variations in Android software and devices.

Discussion/what is happening next: Drug calculations are a globally challenging subject for healthcare students, necessitating innovative approaches to enhance learning outcomes. The widespread adoption of the LääkeMaisteri game in Finland, as evidenced by the user data analytics, highlights its effectiveness in addressing this educational gap. To improve the game's appeal and broaden its user base, we are currently developing additional content. A Swedish translation version is set to be published soon, with an English version also in the pipeline, thus making the game more versatile and appealing to a wider international audience.

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P-17: Assessing Information and Cybersecurity Training Needs among Social- and Healthcare Professionals

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I**ntroduction:** Securing information systems assets has become a top priority for organisations in order to protect them from malicious attacks. Both the cyber-attacks and data breaches have increased dramatically in recent years. A significant number of organisational information security incidents are due to exploitation of human elements. [1]
This study aimed to explore the educational needs and preferences regarding information and cybersecurity training among social and healthcare personnel. The survey was part of a broader study on information and cybersecurity competence and education needs of social- and healthcare sector.
Material and Methods: A structured questionnaire was distributed to approximately 3,500 participants working in specialised and primary health care organizations. The discretionary sample was designed in collaboration with the target organizations. The survey was conducted between autumn 2020 and spring 2021. A total of 383 people responded to the survey. The majority (51 %, n=194) of respondents worked in nursing positions. 12% (n=45) of respondents worked in medical positions and 10% (n=39) in managerial positions. Around a fifth (18%, n=70) of respondents were in the "Other, which?" -category. This group included, for example, social care and rehabilitation professionals. The data was analysed using data analysis tools from the Webropol survey program. Open responses were used to supplement and illustrate the results. Further analysis of the data is ongoing.
Results: Data analysis revealed that while a majority of respondents felt adequately skilled in information and cybersecurity (78%), there were specific knowledge gaps related to outsourcing of services, hardware and software purchases, the EU General Data Protection Regulation, and information influencing. Furthermore, 38% of participants reported receiving training on protecting against malware, while only 44% believed the current training in information and cybersecurity was sufficient. The study highlights the need for enhanced training programs, with 84% of respondents expressing a desire for more information security, data protection, and cybersecurity training. Additionally, respondents emphasized the importance of group discussions and addressing these issues in work communities and department meetings. Online training was preferred over face-to-face training, and additional information by email was requested.
Discussion: These findings underscore the necessity of developing organizational strategies to promote cyber threat awareness and offer comprehensive training to healthcare professionals. By addressing the identified knowledge gaps and adopting interactive training methods, healthcare organizations can improve their cybersecurity posture and effectively mitigate cyber risks. Participants expressed the wish that information and cybersecurity issues would be discussed more in work communities. They also wanted these issues to be discussed in department meetings. This result supports Khan's [2] study, which found that group discussion is the most effective way to develop information and cybersecurity skills.
The study was carried out as part of the HealthCare Cyber Range (HCCR)[3] project. The project was completed in 2019–2021. The project was coordinated by Jyväskylä University of Applied Sciences and funded by the European Regional Development Fund (ERDF). The project developed the cybersecurity expertise of health care as well as the cybersecurity exercise of health care actors.

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P-18: Optimizing the Creation and Transfer of Care Transmission Records in Germany

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I**ntroduction:** With the shortage of qualified nursing staff in Germany and the growing number of people needing care, more efficient administrative processes are needed, especially as many are still paper-based. One area for optimization is the Care Transmission Process, which includes transferring necessary patient-relevant information. Literature research highlighted several current issues related to Care Transmission Records (CTR) and the CTR-Transmission Process: (1) The *time-consuming creation of CTRs* [1] [2], (2) the *lack of a standard format for CTRs* [3]–[5] and (3) *proprietary software solutions and formats for CTR creation*. Observations in a Bavarian hospital and two care facilities from 2020 to 2022 and a German-nation-wide online questionnaire in 2022 [6] confirmed the literature research findings and provided further insights. Care staff faced interruptions (e.g., telephone calls) while manually transferring CTR data, demanding high focus. CTRs often arrive with or even after the patient, usually via fax, hindering the nurse's ability to prepare adequately [7]. Moreover, CTRs exhibited varying semantic (wordings) and syntactic differences (layout, free text fields) or lacked essential information, leading to additional inquiries.
Project aim: To ease caregivers' burden, digitizing and standardizing CTRs is essential. The research project has two aims: 1) Piloting the transmission of nursing-relevant patient data with the help of a German-specific secure transmission infrastructure for health data (telematics infrastructure, TI). 2) Implementing and evaluating the newly developed standard (CTR-MIO) by the mio42 GmbH based on FHIR-Bundles in XML Format. To make the current non-human-readable data format user-friendly and bridge the gap until widespread adoption of this new format by proprietary systems is given, the research teams create a viewer and editor software for visualizing CTR-MIO as a transitional solution. This editor can be installed as a software module on facilities computers or integrated into existing software products.
Results: To understand the structure and content of the CTR-MIO specification, an extensive systematic analysis was carried out, which focused on 1) a comparison of all available paper-based CTRs with the new PIO specification to understand the differences and 2) a discussion with cooperating care staff of this project (one hospital n=3, two care facilities n=5) to make the new standard transparent and discuss any questions. These results were forwarded to the mio42 GmbH and influenced the final 2022 published specification. Based on these findings' initial interaction prototypes for a PIO Viewer & Editor were created and tested with care staff that is involved in the creation of CTRs in their facilities (low-fidelity (n=6) and high-fidelity (n=6)). The care staff feedbacked that, e.g., the new standard is very complex and has a greater extent than in their currently used layouts, so they wish for a reduced variant or the possibility to hide less critical information. They also wish for a clear visual guideline to navigate and additional information points to understand aspects of the standard they are not familiar with. These aspects were considered and implemented, and in the last feedback round (n=6), they viewed the adjustments very positively.
Discussion/what is happening next: Until the end of the project (09.2024), the PIO Viewer & Editor will be implemented and tested within an application study. Knowledge gained throughout this process will improve the system and be released as open-source software, potentially serving as a template for other hospital and care systems. Acceptance by software manufacturers is yet to be determined. This research is a sub-project called DigiPÜB and is part of the joint project CARE REGIO, funded by the Bavarian State Ministry of Health and Care under grant number MGP-2101-0004.
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P-19: Development model of digital wellbeing services for families

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I**ntroduction:** The project "Improved Access to Welfare Services by Digital Solutions" is funded by the city of Vaasa, during a time period of three years 2021-2024. Project partners are the University of Vaasa, University of Åbo Akademi, Novia University of Applied Sciences and Vaasa University of applied sciences.

Aim of the Project The objective of the project is to gather data about different digital solutions used in welfare services aimed to provide support for children and families. The purpose of the study is to attain information about the service users' experiences, including the professionals working with families, in order to produce ideas for development regarding digital family services.
Results The results are published on digital platforms and as publications, and in workshops and events that promote the development of future digital services. During the first year (2021–2022), the project focused on parents' views. The second phase of the project (2022–2023) consisted of three sub-studies, which focused on social and healthcare and early childhood education professionals, managers, and politicians. In the second phase Vaasa University of Applied Sciences and Novia University of Applied Sciences carried out interviews with professional to supplement the information collected from the parents in the first phase. In the final phase, the intention is to compare and combine these experiences by creating an evidence based digital service model.
Discussion/What is happening next: The goal of this abstract session is to describe the key findings of parents and professionals. In addition, the purpose is to describe the central recommendations for developing digital services that have emerged from the results in Ostrobothnia.
The results of the first and second phase of the project have been compiled in VAMK's Publication series for publication. Nyholm, L. et al. Improved Access to Welfare Services by Digital Solutions. Loppuraportti 2022 https://urn.fi/URN:ISBN:978-952-5784-63-3 and Nyholm, L. et al. 2023. Improved Access to Welfare Services by Digital Solutions. Hankeraportti II. https://urn.fi/URN:ISBN:978-952-5784-65-7 .

P-20: Designing for employee-centered wellbeing at work - Digital methods, key results, and effectiveness of the development projects

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I**ntroduction:** Working life is constantly evolving, and the COVID-19 pandemic has accelerated this change in recent years. Remote work has become increasingly common, emphasizing the importance of self-direction, initiative, and flexibility among employees. Additionally, companies are focusing on developing factors that attract and retain employees. While digitalization is often associated with increased productivity and positive outcomes, it is crucial to consider how employees succeed in their work and serve customers. Employee wellbeing plays a vital role in this process, as satisfied employees are better equipped to serve customers in a customer-oriented manner. Traditionally, support measures for occupational wellbeing have been top-down and leader-centric. However, the changing landscape of work challenges companies to tap into their employees' ideas, knowledge, and skills, even in development work. Adopting service design methods for promoting wellbeing at work enhances employee centricity within companies. Employee participation supports their enthusiasm and commitment to work, while increasing internal motivation and wellbeing at work. Moreover, the development of factors that impact wellbeing at work, such as work processes and interactions, contributes to overall work satisfaction.

Aim the project: During 2021, wellbeing at work development processes were conducted digitally in seven organizations using Teams and Miro (a visual collaboration platform) due to the COVID-19 pandemic. The projects aimed to address various factors affecting wellbeing at work. The target audience included employees and their supervisors, with the goal of either developing wellbeing factors or implementing wellbeing support processes. These projects spanned six months and were evaluated for effectiveness using a logical model. Service design was employed as a method for enhancing wellbeing at work. A notable aspect of this approach is the central role of employees throughout the entire development process, from planning to final implementation. By utilizing the process and methods of service design, wellbeing at work development provided a framework that facilitated change management within the companies. Additionally, each participating organization appointed a development group and received training on implementing the design process and methods, ensuring the sustainability and long-term effectiveness of these projects.

Results: The digital development process using the Miro platform was a new experience for all participating organizations. It presented challenges for both service designers and the development groups within the organizations, as well as the participating employees. Face-to-face ideation workshops were found to be the most effective, if possible. Evaluation results indicated that each organization achieved 2-3 objectives related to wellbeing at work that were set at the beginning of the project. Organizations also gained an understanding of the process and methods of service design and received tools for their everyday work. HR operations and supervisors developed a better understanding of employee needs, resulting in employees feeling heard and the development of more employee-centered wellbeing management processes. Evaluation findings showed that some projects successfully reduced worker depression, improved relationships with superiors, or facilitated the recruitment of new employees, depending on the goals of each organization's project. Furthermore, the organizations continued to use employee-centered development methods even after the project concluded. The use of service design methods for wellbeing at work development is an excellent approach that can be implemented digitally.

Discussion/what is happening next: Laurea university of applied sciences is implementing new projects.

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P-21: Creating an eHealth program to introduce digital care paths to the professionals

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I**ntroduction:** Health Village (terveyskylä.fi) is an innovative digital healthcare platform based in Finland. It is an online service that provides a wide range of healthcare information, resources, and tools to empower individuals to take control of their health and well-being. Health Village was launched in 2015 and is a collaboration between University Hospitals and wellbeing services counties. The main goal of Health Village is to provide reliable, evidence-based information and support to patients, their families, and healthcare professionals. The platform offers a variety of services and resources, including virtual care, educational materials, self-assessment tools, and peer support communities.

Creating an online course for digital care path developers is an important endeavor that can help professional develop their skills and knowledge necessary to excel in this field. The users were involved in the design process of the course. This course covers various topics such as introducing what are selfcare and digital care paths in the Health Village, development on digital care paths and user experience design. The course is designed to be accessible to individuals of all skill levels and backgrounds, providing a comprehensive learning experience that can cater to the needs of diverse learners. Additionally, the course incorporates interactive elements such as development method tools, real-world case studies, and assessments to help learners apply what they have learned and evaluate their progress. Overall, Health Village aims to promote health literacy, patient engagement, and accessible healthcare services through its user-friendly digital platform.

Aim the project: The aim of this abstract is to describe the development of eHealth program about the digital care path introduction. The methods of Lean and Service Design are used in combination to create a more efficient and effective process for providing services to customers. Lean is a methodology that focuses on eliminating waste and increasing efficiency in a process. It involves analyzing each step in a process to identify areas of inefficiency and waste and then implementing improvements to streamline the process. Whereas the Service Blueprint is a method that provides a detailed visual representation of the service delivery process. It helps organizations to identify potential issues in the process and to develop solutions to improve the overall customer experience.

By using both methods together, an organization can identify areas of inefficiency in their service delivery process and develop solutions to improve the customer experience. This involves designing the process to ensure that each touchpoint with the customer is positive and adds value to the overall experience. A preworkshop was organized to get users input about their thoughts and user experience will be requested after the course and the results will be used to evaluate the course further.

Results: Users' experience will be presented at the conference.

Discussion: Ultimately, an effective online course for digital path developers can help individuals develop the skills they need to succeed in this dynamic and growing field. By using Lean principles organizations can eliminate unnecessary steps, reduce rework, and improve communication among team members. Adding the Service Design methods, it brings out the customer journey, ensures that each step of the process is designed to provide value to the customer and enhance their learning experience. This can involve designing the course content to be engaging and interactive, providing feedback and support to learners, and creating a user-friendly platform for accessing the course.

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P-22: DYNAMO: A platform for sharing threat information and improving resilience by leveraging the benefits of the business continuity process in the healthcare, power, and maritime sectors

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I**ntroduction:** The DYNAMO project is a European Union-funded project (under EU Horizon Europe research and innovation) that aims to develop a platform for the sharing of threat information among security stakeholders. The entire project is designed as a phased project, where the journey from concept to outcome is a step-by-step process driven by user feedback. [1]
Aim of the project: The DYNAMO platform will be able to collect an organization's skills data and use this data to create custom training programs that will improve the organization's resilience. This will support different stakeholders in critical sectors including healthcare, help them to increase their situational awareness, and ensure that they are adequately prepared for critical risks. Using artificial intelligence (AI), DYNAMO combines the two disciplines of business continuity management (BCM) and cyber threat intelligence (CTI) to enable resilience assessment and minimize the number of cyberattacks in critical sectors.
Results: The result is the development of a core capacity to store and share CTI among DYNAMO stakeholders, especially to protect shared information. The outcome is a trusted environment among users of the platform for sharing intelligence. The poster/paper presents the tasks analysing CTI sharing and trust needs of the DYNAMO use cases (healthcare, power, maritime) while also meeting regulatory requirements. The developed module is based on open-source solutions, such as MISP, in order to leverage its advanced storing and sharing functionalities. It allows the integration with other open-source tools like Cortex and TheHive, further extending the interoperability of the platform. Additionally, it provides access to DYNAMO modules to community-developed analysers and information feeders.
Discussion/what is happening next: Involving end users in developing information security policies through a collaborative writing process develops policies that reflect the technical and security needs of both the IT department and the actual medical and business needs of frontline clinicians [2]. The DYNAMO solution will be tailored to address the specificities of the project use cases (e.g., healthcare) and meet the end-users' needs and requirements. Then, the developed modules will be piloted and evaluated by DYNAMO stakeholders, one pilot seat being Gemelli Hospital in Rome. The project also plans to develop additional modules that will further extend the capabilities of the platform.

Acknowledgements: The DYNAMO project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101069601. The second author (Rathod, P) would also like to acknowledge the CyberSecPro project received funding from the European Union's Digital Europe Programme (DEP) programme under grant agreement No 101083594. Special thanks to the partners of these projects and their contributions. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

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P-23: CyberSecPro digital Europe innovation project: cybersecurity skills demand in the health sector

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I**ntroduction:** This paper presents the CyberSecPro project under the Digital Europe Programme, with a key emphasis on the demand for cybersecurity skills in the health sector. The project focuses on empowering higher education institutions to provide practical and relevant skills for this critical sector. This paper also highlights the relevance of the CyberSecPro project in the context of the healthcare sector. In the future, this paper will provide more in-depth insights and report specific outcomes from the ongoing research and innovation work being conducted as part of the market demand work package. Further, CyberSecPro aims to pilot the European Cybersecurity Skills Framework in practice for cybersecurity professional training.
Aim of the project: CyberSecPro aims to bridge the gap between degrees, working life, and marketable cybersecurity skill sets necessary in today's digitalization efforts. The project will provide examples of best practices for cybersecurity training programs. 15 higher education institutions and 13 companies from 16 countries are working on this agile, collaborative, and multi-modal project.
Results: Current research and state-of-the-art studies confirm the rapid development of the e-health sector. Cybersecurity plays a central role for healthcare organizations and data security, which are increasingly the targets of cyberattacks. Our study identifies high-demand and in-demand cybersecurity knowledge areas and skills needed for the healthcare sector and data security, including risk management and security operations center. Our results show that awareness of cyber risks is weak in the healthcare sector, and a 5-step resilience cycle can help to provide consolidated data security and protection.
Discussion/what is happening next: Awareness of cyber risks is weak in the healthcare sector. Understanding cyber risks and recognizing the effects of one's own activities increases the cybersecurity of the entire organization. Future studies can leverage the benefits of the piloting within hands-on cybersecurity training for the health sector with skilling, upskilling, and reskilling approaches.

Acknowledgements
The research conducted in this paper was triggered by the project ‘Collaborative, Multi-modal and Agile Professional Cybersecurity Training Program for a Skilled Workforce In the European Digital Single Market and Industries’ (CyberSecPro) project. This project has received funding from the European Union’s Digital Europe Programme (DEP) programme under grant agreement No 101083594. Special thanks to the partners of these projects and their contributions. The third author (KK) would also like to acknowledge the project ‘A Dynamic and Self-Organized Artificial Swarm Intelligence Solution for Security and Privacy Threats in Healthcare ICT Infrastructures’ (AI4HEALTHSEC) under grant agreement No 883273. The sole responsibility for the content of this paper lies with the authors. The authors are grateful for the financial support of these projects that have received funding. The views expressed in this paper represent only the views of the authors and not of the European Commission or the partners in the above-mentioned projects.
References: References are available from the authors

P-24: How to Motivate Social and Health Care Clients to Use Digital Services? Overview of an Online Study Unit for Social and Health Care Professionals

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Background: Social and health care services have become increasingly digitalized. Many fare well with digital services. Clients who are in vulnerable positions, however, often need guidance and motivation to access and start using digital services. As a result, the professionals need to revise their approaches and often gain a more thorough understanding of the ethical challenges vulnerable groups may have. Whilst face-to-face care and contact are becoming complemented or replaced by digital care and services, some social and health care professionals may need to update their competences to support and motivate their clients to use digital social and health care services [1].

Aim of the project: Motivational Digital Support with Social and Health Care Clients was a 5-credit (ECTS) study unit, designed to build up the competences of social and health care professionals. Integrative pedagogy was applied as the learning method: the participants engaged independently with materials, learnt dialogically through group discussions, and performed group tasks [2]. The aim was that participants were able to: (1) comprehend challenges and solutions related to digital services, (2) comply with the legislation and ethical guidelines for digital support, (3) assess the needs of clients in vulnerable positions, (4) advise clients on information security issues, (5) apply counselling skills to support clients, and (6) motivate clients to use smart devices and digital services independently.

Results: 63 social and health care professionals had completed the study unit during 2022 and first half of 2023. The feedback has been positive. In their evaluations of the study unit, the students described that they have, for example, learned about providing motivational digital support to different client groups. They have valued learning from experiences of other students. Some struggled with the online learning platform and felt that some of the topics were already familiar to them. Motivational skills, data security matters and ethical guidelines, however, have been broadly valued. Some students described that they have successfully started applying the newly acquired skills in client work.[3]

Discussion: The digitalization of social and health care services cause fatique and ethical distress to the professionals because many clients are not able to use e-services independently and the professionals have neither the time nor the appropriate guidance skills to support the clients. The students felt that the motivational skills gained in the study unit are useful in supporting clients to use digital services.

Motivational Digital Support with Social and Health Care Clients is available as a fully automatized online study unit. It is free of charge and can be accessed through Avoin Ammattikorkeakoulu and Campus Online (in Finnish).

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P-25: Radar Setup for Vital Sign Monitoring of Driver in Vehicular Environment

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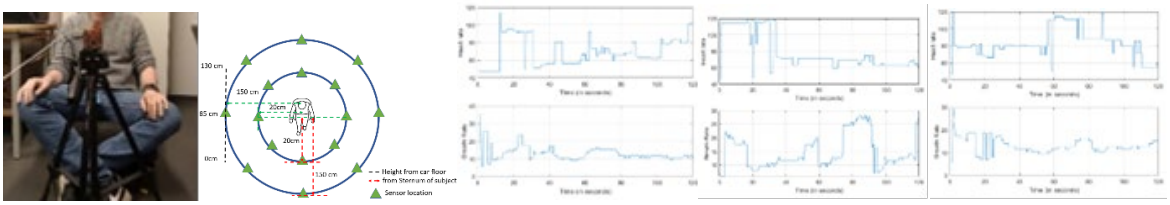
I**ntroduction:** Fully autonomous vehicles are no longer a dream but are now a successful technology across the globe. In the last decade, there have been significant improvements in vehicular technology, especially in providing a safer and more enjoyable environment for drivers and passengers using features such as autopilot, assisted parking, speed warning, and many more. Apart from this, e-Health services have also become a prime aspect of the modern vehicular industry. Therefore, this research presents a radar setup based on Frequency Modulated Continuous Wave (FMCW) technology in the band of 76 to 81 GHz for vital sign monitoring of driver and passengers in a vehicular environment. The effect of system parameters including the driver's location with respect to radar, radar operational parameters, and opted pre & post-processing techniques are studied using human subjects to determine the optimum setup for vital sign monitoring [1, 2].

Material and Methods: The measurements are taken with different radar placement options based on which the optimized position of radar in vehicular environment is selected. The AWR 1642 single chip setup [3] is placed 20 cm to 150 cm from the subject and moved in three-dimensional space in between the measurements of 120 seconds each. There are 2-4 transmit/receiver antennae on the radar chip with peak gain>9dBi across the operating frequency. The setup measures the rate of chest displacement to calculate heart rate and breathing rate of a person. The results measured from the proposed setup are compared with BioHarness 3.0 module developed by Zephyr Technology which is worn by the subject during the measurements.



a **b** **c** **d** **e**

Results: Fig. 1(b) and (c) presents the heart rate and breathing rate of a typical driver with normal breathing and fast breathing respectively. Fig. 1(d) shows the comparison of measured results with benchmark results from Zephyr. The frequency range of 76-81 GHz is optimal for the simultaneous measurement of heart rate and breathing rate due to its high sensitivity towards small movements. The hardware setup utilized in this study consists of a car seat with adjustable height along with a tripod stand to hold the radar chip which allows movement of sensor along roll, pitch, and yaw. The measurement settings are shown in Fig. 1 (b) which has a total of 32 possible locations for radar at two distinct heights of 80 and 130 cm from the car floor. The heart rate and breathing rate results for three cases are presented in Fig. 1 (c,d,e). All results are verified by data collected from Zypher and are found to be fairly accurate.

Fig. 1 (a) Hardware setup for vital sign monitoring, (b) Measurement settings (c,d,e) Heart rate and breathing rate for radar placed (c) @150 cm from sternum of subject (front) at a height 85 cm from car floor, (d) @45^0 from sternum of subject (front) at a height 85 cm from car floor and (e) @ 180^0 from sternum of subject (back) at a height 85 cm from car floor.

Discussion: Our results suggest that radars offer a very effective method for vital sign monitoring of drivers and passengers in vehicular environments. Other systems utilized for this task are primarily based on imaging (cameras) which has the inherent drawback of security and privacy. Radars also have the additional advantage of penetration through clothes and other materials to provide better accuracy than imaging-based methods. It is observed that the radar placed in front at a height equivalent to sternum of the subject provides best sensing results as compared to when it is placed at any other location. The false alarm rate for cases when the radar is placed at 90^0 and 135^0 wrt. subject is very high. Higher-order features such as heart rate variability, drowsiness, and mood can be calculated from these initial results using signal processing techniques which can be an extension of this work. The system architecture in 6G for e-healthcare includes both communication and sensing as its primary fronts which are to be fulfilled by collaboration of communication and radar technology resulting in Joint communication and sensing (JCS) based systems. The JCS systems will play a crucial role in advancing vehicular technology making it fully smart in terms of in-vehicle and outside sensing and data processing/communication.

References: References are available from the authors

P-26: Forecasting trends and skills needed in managing the transformation to digital health – ManagiDiTH

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I**ntroduction:** The Managing Digital Transformation in the Health Sector (ManagiDiTH) project consortium, funded by the EC Digital Europe Programme (EC-HADEA Grant Agreement No. 101083896), is setting up a Master programme to qualify people in digital skills for the health sector. This Master programme is being co-created through an intercultural collaboration of top lecturers and sector experts from Finland, France, Greece and Portugal. University members of the consortium are Iscte - Instituto Universitário de Lisboa, Aristotele University of Thessaloniki (AUTH), Laurea University of Applied Sciences, École Supérieure d'Ingénieurs en Électrotechnique et Électronique (ESIEE Paris) / Université Gustave Eiffel (UGE).

Aim: The first project task was to conduct a Skills Need Forecasting study to consolidate the assessment of social, economic and technological trends in the health sector and their impact in terms of organisational and individual capacities. In all four countries, a desk review, focus groups with experts working in health and digital sectors, service users and patient groups, and individual interviews with key stakeholders were conducted.

Results: The Skills Need Forecasting study results influenced the final curricular structure for the Master programme. Feedback from the focus group and interview participants included the following points.

Main gaps and needs identified in Digital Health in all four countries include:

- Lack of data interoperability
- Gaps in digital skills professionals, i.e. "*Gaps in human capital, including in digital skills and education*."
- Issues for security around healthcare data
- Need to develop products which are internationally marketable

Some country differences include:

- Very different healthcare systems and public/private health options.
- Different levels of trust in or acceptance of government and in technological solutions.
- Different socio-economic context and situations.
- Different pathways through education and vocational qualifications.

Key points from the research which shaped the Master Programme design:

A. It was suggested that we incorporate the **IMIA competency framework** [1] which permits international accreditation.
B. **Key strengths to develop** in this Master Programme:
1. Interdisciplinarity and Pluridisciplinarity are major strengths – encourage this at all levels of the programme.
2. Innovative digipedagogic approach – online and/or b-learning delivery methods.
3. International focus – benefits such as international virtual classrooms, cross-national problem-solving activities.
4. The curriculum should include practical training and real-world placements.

C. **Gaps and omissions** suggested for consideration:
1. **Patient involvement** is not very evident. Patients need to be more involved in design and delivery, throughout.

Discussion/what is happening next: The Master programme design has 3 main components: 1. Health sector skills; 2. Societal skills; and 3. Digital skills. The digital skills component has two possible branches, Data Science and Interoperability. Students will choose according to their interest, background profile and previous knowledge acquired on specific topics. The final structure and further information on the Master structure and curriculum design can be found at https://managidith.eu, and it will open up student applications from across the EU this autumn. The start date for the first cohort of students will be March 2024.

Challenges for the project include tight deadlines, compatibility between different countries' needs for accreditation and course design, the need to enable students to qualify for national professional accreditation systems, and ensuring that the Programme keeps up with new technology, terminology and expectations in this fast-moving field of digital health.

References: References are available from the author

P-27: Smart and Health Ageing through People Engaging in supportive Systems Shapes- Ethical issues of SHAPES pilots

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I**ntroduction:** Background: According to the United Nations (UN), 25% of the population comprises older individuals. The aging of the population has led to an increased need and demand for eHealth technology. Even individuals with significant care requirements and reduced functional abilites are increasingly receiving care in their homes. Moreover, there is a growing shortage of nursing staff. Digital solutions provide novel responses to these challenges, but they also bring to the forefront questions concerning the definition, implementation, and consequences of care. Therefore, it is imperative to examine eHealth services from an ethical perspective.

Aim the project: The objective of the EU-funded SHAPES project is to establish the first European open ecosystem that fa-cilitates the utilization of practical digital solutions, which bolster and extend the healthy and independent lives of older indi-viduals. This project engaged over 2,000 older individuals across 15 pilot sites in 10 EU Member States, including six refer-ence sites associated with the European Innovation Partnership (EIP) on Active and Healthy Aging. It also involved hundreds of key stakeholders with the goal of discovering solutions that enhance the health and well-being of older individuals, promote independence, and contribute to the long-term sustainability of European health and care systems.

As part of the ethics risk management work of the SHAPES project, Laurea University of Applied Sciences conducted ethics risks workshops with SHAPES pilots. The ethical risk analysis is based on the material collected from seven pilot theme groups, including Smart Living Environment for healthy ageing at Home, Improving In-Home and Community-based Care, Medicine Control and Optimisation, Psycho-social and Cognitive Stimulation Promoting Wellbeing, Caring for Older Individ-uals with Neurodegenerative Diseases, Physical Rehabilitation at Home and Cross-border Health Data Exchange Supporting Mobility and Accessibility for Older Individuals. The experts considered various ethical risks especially from the point of view of EU Fundamental rights, Bioethics, Ethics of Care and Human Capabilities. The workshops were organized by Laurea, and they took place between June 2022 and January 2023.

Results: The findings indicate that the risks associated with SHAPES solutions encompass data protection and information security concerns, escalating inequality, the dehumanization of care, and access to ethically sustainable services. It is essential to consistently factor in the need for sufficient support services and user-oriented development. Workshop participants stressed SHAPES' commitment to supporting the independence and autonomy of sensitive user groups. Independence and autonomy emerged as central themes in risk mitigation.

In order to reduce data protection and information security risks in digital solutions, the end users' right to be forgotten must be taken into account and the GDPR compliance of solutions must be ensured regarding both technology and organisational ar-rangements. In order to ensure human-centric care, the know-how of experienced experts should be utilized and the interest organizations of sensitive customer groups should be involved in the joint development. It must be ensured that the functionali-ties do not increase the workload for the caregivers' everyday life. One possible way to avoid this is to use the robot also as a way for the older person to stay in contact with people. However, there was concern that it must be ensured that there are pro-cesses in place that allow the participants to link to the health care provision face-to-face if they wish. Growing inequality is prevented by taking cultural factors into account, ensuring fair funding models for the services and providing user-oriented education. Promoting the availability of ethically sustainable services requires more customer-oriented health care, increasing the freedom of choice of end users, the presence of public supervision and taking into account the functional limitations of older people.

According to the results, it can be stated that the majority of ethical risks and their mitigation are related to SHAPES manage-ment and business models. The challenges are related both at the level of the provision of digital services and at the level of the entire ecosystem. In addition to development projects and national measures, international and EU-level criteria and more joint development are needed to ensure more ethically sustainable and business-profitable services in the future.

Discussion/what is happening next: Discussions about SHAPES ethics and various challenges and risks related to the SHAPES ecosystem and the production of its digital services are reported and mitigation strategies related to these challenges are drawn up as part of the SHAPES governance and business models, including updates of original ethical requirements and SHAPES code of conduct.

P-28: Exoskeltons for Detecting Employees' Occupational Health Risks

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Introduction: There is a new global trend for using wearable intelligence devices such as exoskeleton robots for assisting employees at work, but the deployment of exoskeletons is still limited and new frameworks for assessing their adoption and use are needed [1]. It has been reported that occupational injuries and diseases are costly problem worldwide [2,3], and companies are looking forward adopting exoskeleton for cutting employees' workload and increasing productivity [4]. Exoskeletons are normally tested at the laboratory environment [5], but the test in real working environments have been limited. Being related to testing procedures, it has been stated that the physical human–exoskeleton interactions has been poorly addressed in the literature [6]. The greatest number of exoskeletons used in industry are passive exoskeletons, which are able to distribute load by exploiting mechanical structures, torsion springs and elastic materials. However, they are not able to detect the users' movements or to assess users' physical load and occupational health risks. There are devices for detecting users' muscle activity at work with and without exoskeleton [7], but the integrated solution with motion tracker is still missing. There is a need for designing the framework and combination of an exoskeleton and a sensor which is able to record an employee's movement during the work, and to predict the occupational health risks. The development work is done in collaboration with Finnish and Chinese partners.
Aim the project: The aim of the project was to design the framework for assessing the employee's movement during work tasks. There are some vision-based tools and methods available for detecting human movements [8], but nowadays also motion sensor-based methods such as ROKOKO motion capture [9] which can be used in occupational health settings. Our objective was to design and to construct the experiment where we detect the human motion with exoskeleton at work by using ROKOKO device. The exoskeleton will be modified and equipped with a 3D accelerator and gyro sensors which are able to report the movement (counter, speed, angles) of the human movement. The idea is to combine data from both ROKOKO motion capture suit and exoskeleton for visualizing the human movement and body parameters during the work tasks for understanding if that kind of framework would be useful for assessing occupational health risks.
Results: The experiment is going on and the tentative results are expected to be ready during the end of the summer 2023. We already have designed the components of the framework and the architecture of the data handling.
Discussion/what is happening next: The framework and a modified exoskeleton with sensors will be tested both in Finland and China, and the suggestions for using exoskeletons for assessing the early stage of occupational health risks are reported.

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P-29: Virtual Platform for Medical Device Training – A virtual learning platform solution that certifies and develops health technology and medical device expertise

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Background: Safe and competent use of medical devices in patient care is of paramount importance to both the patient and the medical staff [1, 2]. Despite an obvious need for training and orientation to improve medical device safety, there are major challenges how to acquire and provide sufficient education [3]. Medical device training and orientation need to be more effective in order to ensure a sufficient level of health technology and medical device skills among health care personnel. Since training and orientation is challenging during working hours, it is necessary to develop new types of pedagogical extended reality (XR) solutions including virtual (VR) and augmented reality (AR) technology for digital and medical device competence assurance, training, and orientation.

Aim the project: This project aimed to produce a virtual learning platform solution that certifies and develops health technology and medical device expertise. The virtual / digital learning environment developed in the project provides the healthcare professional with an easily accessible and reachable learning platform that supports co-development. The uniform and standarsized education and learning environment and competence assessment model provided by the virtual / digital learning environment will improve the quality of digital systems and equipment competencies of healthcare professionals working in the healthcare and social welfare field. Competence certification reduces incidents and hazards and increases customer and patient safety and well-being at work. Virtual (VR, XR) and augmented reality (AR) learning environments facilitate, unify, and develop professional use of digital systems and medical devices. Project partners are Tampere University of Applied Sciences (leading partner), Turku University, Ostrobothnia Wellbeing Services County and Finnish Center of Client and Patient Safety. The Virtual Platform for Medical Device Training project has been funded from REACT-EU instrument as part of the European Union COVID-19 pandemic recovery measures.

Results The project's innovative virtual /digital learning environment motivates healthcare and social welfare employees to use digital devices, systems and technologies and develop skills. In this way, the long-term indirect effects of the project will also be achieved by telemedicine, home and home nursing clients and, for example, personal carers, as the skills of professionals can be better verified and the professional can guide others more expertly in digital systems, health and medical technology. Platform's further development and maintenance remains to Finnish Center of Client and Patient Safety.

What is happening next: The platform will be released in September 2023 and after that it will be communicated and further developed with various parties by Finnish Center of Client and Patient Safety.

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Lehden ISSN-tunnus on 1798-0798.

Lehden vastaava päätoimittaja on TtT Pia Liljamo.

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The Journal was established in 2009. The aim of the Journal is to promote scientific research, communication and education in the fields of information and communication technology relating to social and health care, telemedicine, eHealth and eWelbeing.

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The Journal welcomes articles on information and communication technology of social and health care, telemedicine, eHealth, and eWelbeing. Instructions for authors can be found on the Journal website. FinJeHeW is mainly a Finnish language journal, but also includes articles, abstracts and other material in English. All submitted manuscripts are evaluated by the editor. Manuscripts that are considered suitable for publication in the Journal are sent to two referees for assessment. The contents of this journal will be available in an open access format starting from autumn 2017. The Journal is published in electronic form and includes four issues per year.

Journal ISSN index is 1798-0798.

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