

An explorative Delphi study to uncover knowledge, attitudes and skills for nurses using eHealth.

Anna H Moerman*, Cornelis TM van Houwelingen, Helianthe SM Kort

* corresponding author at: Lectoraat Vraaggestuurde Zorg, Hogeschool Utrecht, Utrecht, the Netherlands tel: 0031639012977. email: anne.moerman@hu.nl; thijs.vanhouwelingen@hu.nl; helianthe.kort@hu.nl

Student: AH Moerman, 3995348

Course: Afstudeeronderzoek

Status: Final version

Date: 30th of June 2014

Words: 3500

Reference style: Vancouver

Journal: Nurse Education today (open access) IF.1.218 / British English / 3500 Words

Supervisors: CTM van Houwelingen MSc, Prof. Dr. HSM Kort

University tutor: Dr. H van Os - Medendorp

Utrecht University, Clinical Health Sciences, Master programme Nursing Science, UMC-Utrecht

Internship institute: University of applied sciences Hogeschool Utrecht

Transparency reporting: STROBE statement

Abstract: 296 words

Dutch Summary: 298 words

Abstract (296 words)

An explorative Delphi study to uncover knowledge, attitudes and skills for nurses using eHealth.

Background: eHealth, the use of information and communication technologies for health is seen as an innovative solution. eHealth training has only been scarcely integrated into nursing education; students lack insight into the practice of eHealth.

Objective: The aim of this study is to uncover what knowledge, attitudes and skills nurses need for the use of eHealth to community-dwelling patients, in order to improve education for bachelor nursing students.

Method: An exploratory 3 round Delphi-study was conducted to obtain group consensus. A purposive sampling procedure was used to recruit experts experienced in eHealth applications for community-dwelling patients. Thirty-two homecare nurses, 12 lecturers in bachelor nursing education, 2 patients and 5 producers of eHealth applications participated. We used an instrument based on the concept of 'entrustable professional activities' to collect data. To execute entrustable professional activities, adequate knowledge, skills and attitudes are required. In two on-line sets of questions and an expert meeting, 14 professional activities for nurses using eHealth were presented with: 15 knowledge, 9 attitude and 28 skills items per activity. A threshold of 80% was used for consensus.

Results: This study suggests that at least 10 items are needed to entrust a specific eHealth task to a nurse. Communication skills, clinical knowledge, an supportive attitude, an ethical awareness, analytical skills to solve problems, coaching skills and the ability to effectively combine clinical experience with eHealth in decision-making seem essential. Moreover, we achieved consensus for 14 entrustable professional activities.

Conclusion: These findings provide a transparent view of what might be taught regarding eHealth in homecare settings in bachelor nursing curricula.

Recommendations: More research is needed to assess the validity of the entrustable professional activities and the associated knowledge, attitude and skills items.

Keywords: nursing education, entrustable professional activities, competencies.

Een verkennende Delphi-studie naar kennis, attitude en vaardigheden voor verpleegkundigen bij het gebruik van eHealth

Achtergrond: eHealth, het gebruik van informatie- en communicatietechnologieën in de gezondheidszorg wordt gezien als een innovatieve oplossing. Echter, eHealth training is nauwelijks geïntegreerd in het verpleegkundig onderwijs. Studenten hebben gebrek aan inzicht in de mogelijkheden van eHealth in de verpleegkundige praktijk.

Doel: Het doel van deze studie was ontdekken welke kennis, attitude en vaardigheden verpleegkundigen nodig hebben voor het gebruik van eHealth bij thuiswonende patiënten, teneinde het onderwijs voor bachelor verpleegkunde studenten te verbeteren.

Methode: Er is een verkennende Delphi-studie in 3 rondes uitgevoerd. Er is een doelgerichte selectie procedure gebruikt voor het rekruteren van deskundigen in eHealth toepassingen voor thuiswonende patiënten. Tweeëndertig thuiszorgverpleegkundigen, 12 docenten uit het bachelor verpleegkunde onderwijs, 2 patiënten en 5 producenten van eHealth toepassingen hebben deelgenomen.

In deze studie is een instrument gebruikt gebaseerd op het concept beroepstaken, de zogenaamde 'entrustable professional activities', om gegevens te verzamelen. Voor het uitvoeren van beroepstaken zijn kennis, vaardigheden en attitudes nodig. In twee online vragenlijsten en een expert-bijeenkomst, zijn 14 beroepstaken voor eHealth toepassing door verpleegkundigen gepresenteerd met per activiteit: 15 kennis, 9 attitude en 28 vaardigheden items. De consensusdrempel was 80%.

Resultaten: Bevindingen suggereren dat tenminste 10 kennis, attitude en vaardigheidsitems nodig zijn om een specifieke eHealth taak toe te vertrouwen aan een verpleegkundige. Communicatievaardigheden, klinische kennis, een ondersteunende houding, ethisch bewustzijn, analytische vaardigheden voor probleemoplossing, coachingsvaardigheden en het effectief combineren van klinische kennis met eHealth in de besluitvorming, lijken van essentieel belang. Bovendien bereikten we consensus over 14 beroepstaken.

Conclusie: De bevindingen geven een transparant beeld van wat aangeleerd kan worden over eHealth in de thuiszorg in bachelor verpleegkunde opleidingen.

Aanbeveling: Meer onderzoek is nodig naar de validiteit van de beroepstaken en de daarmee samenhangende kennis, attitude en vaardigheden.

Trefwoorden: verpleegkundig onderwijs, entrustable professional activity, competenties.

INTRODUCTION

Healthcare systems across the globe are challenged by the aging population, the increasing prevalence of chronic diseases, complex technologies (1,2) and an expected shortage of staff (3,4). The health care sector is challenged to rethink current paradigms of healthcare delivery (5).

Background

eHealth defined as; the use of Internet and Communication Technology (ICT) in health services and processes combined with organisational change in healthcare systems and new skills (6) is seen as an innovative solution. eHealth covers the interaction between patients and health-service providers over a distance (6).

Applications such as video conferencing, remote monitoring devices measuring physiological parameters, life style monitor equipment and social alarming systems are used for delivering healthcare services to community-dwelling patients (7-9). eHealth might contribute to the quality of life of patients through self-management support (5,10,11). It enables remote real time patient consultations and offers the opportunity to support patients with routine tasks and everyday home activities while enhancing their independence and autonomy (9,12-14) eHealth is becoming an important aspect of nursing practice (15-17).

Available evidence relating to the use of ICT fails to articulate the nursing contribution with any clarity (18). In mainstream nursing practice the use of eHealth is still very limited (16) due to a lack of awareness, skills and confidence in routine practice (19-21). Educating and training professionals to competently utilise eHealth is critical for adoption and implementation success (22,23). Nevertheless eHealth is not formally included in most undergraduate nursing education programs (19), necessary educational elements are lacking (24) and the education of care professionals is inadequate (8).

Education of students has significant impact on their attitudes towards eHealth (19,25). Students need knowledge about *when, why and how*, to use and respond to eHealth (10,12,21,26). In the Netherlands, as in many countries, eHealth education programmes are only scarcely integrated into pre-registration nursing curricula (10,19,24), although nursing universities agree that education should be mandatory for their students (27). Subsequently students lack insight into the range and practice of eHealth (28).

In order to be able to reach its potential, eHealth requires adequately trained users, including nurses (20,29) to ensure the right mix of competencies to cope with innovative

technologies, service delivery models and corresponding changes in the roles and responsibilities of the healthcare delivery team (5,10,30). Therefore awareness and acceptance should be addressed through the inclusion of eHealth in the nursing curricula (20,24). These views are acknowledged in the Netherlands in the Professional Nursing profile. The latest version focuses on the nurse in 2020 who considers eHealth as fundamental to nursing practice (31).

Knowledge and skills, combined with personal characteristics and attitudes to make professional judgments (32), are the building block of competencies. In previous research competencies for the use of eHealth were studied by Gifford et al.(33) and Barakat et al.(12). Where Gifford et al.(33) focused on the effect of a training intervention for behavioural health care providers based on experts visions, Barakat et al.(12) discussed competencies for nurses to support older adults to age in place with academics presenting professionals. Similarities were found concerning privacy and confidentiality issues, an appropriate video presence, and training and support for equipment use. Differences concern the need of an emergency plan and cultural awareness in Gifford et al.(33) and the relevance of communication skills and decision-making skills on end-user data in Barakat et al.(12). For both studies no practices nurses were involved. Research across professionals is needed before the education of future professionals can keep up with developments in eHealth (34).

Problem statement

We see a lack of systematic educational programmes in eHealth. This remains a barrier for the embracement of eHealth by nurses and hampers the integration of the benefits of new technologies for community-dwelling patients. Despite exploratory findings, the specific knowledge, attitudes and skills required by nurses to provide eHealth remain unclear.

Aim

The aim of this study was to uncover the precise knowledge, attitudes and skills bachelor nurses need in eHealth. This inventory has practical relevance because it may serve as a tool for the development of eHealth in nursing curricula.

Research question:

What knowledge, attitudes and skills are required for bachelor nurses to provide eHealth to community-dwelling patients?

METHODS

Research design

Due to unavailability of evidence from practice nurses, lecturers, patients and providers concerning nursing knowledge, attitudes and skills (KAS) in eHealth (12,18,33,34) an explorative study has been conducted. Since a Delphi-study is particularly useful in achieving consensus when there is lack of empirical evidence (35), an exploratory (36) Delphi-design is chosen. This is an effective way to measure and obtain group consensus on competencies from experts in a multi-round format (37,38). Each opinion carries the same weight and has equal value and importance in the analysis, avoiding the bias of dominant views within group discussions (37).

A modified three-round Delphi technique (Figure 1), with two online set of questions in February and March 2014 is used. Round 3, an expert meeting to discuss the findings from the previous rounds and attain the final description of KAS took place in April 2014. The decision over the number of rounds was pragmatic due to available time, which is generally accepted (38,39). Based on literature, we agreed that consensus was reached when 80% of the experts scored items as being (very) relevant to essential. Percentage agreement is generally used (40).

All eligible experts received a link for a URL of the online sets of questions by anonymous email, using a commercially available online survey tool (<http://www.surveymonkey.com>). The sets of questions included instructions for completion and a time frame for answering. They were available for one week, after four days a reminder e-mail was send.

Participants.

The population consists of a) practice nurses from home care services, experienced in eHealth to community-dwelling patients, b) lecturers from bachelor nursing education with special interest in eHealth c) patients receiving eHealth services, invited to express the voice of the customer and d) producers of eHealth applications. Producers were included because ICT applications affect professional performance (41) and training programmes are often provided by the producers (27). We aimed to include these groups of eHealth experts: to guarantee a broad spectrum of opinion, anticipate on attrition rate and to reach a reliable consensus of opinion (37), in amounts of twenty nurses, ten lecturers, 15 patients and five producers. A purposive sampling procedure was used. As has been done in a Delphi study of Eskes et al.(42) the number of nurses are double those of the other groups, as the

opinions of these individuals are fundamental to the aim of this study. Experts participated voluntarily, without any financial compensation.

Recruitment

Organisations were approached by telephone, employees with special interest in eHealth were informed and requested to propose potential experts. Additional information was sent by email about the aim of the study, the relevance for practice and the dates of the consecutive research rounds. When general commitment to participate was received, phone calls were made with potential experts to inform them about the survey, and to check whether they met the requirement of experience for more than 6 months. Patients were recruited for snowball sampling by their nurses, and a patient information letter was provided. Thereafter, an eligibility telephone call was made, to check if patients were experienced for more than six months, whether they were able to read Dutch and if they were able to complete the online questionnaire (a paper version was available).

Research Instrument

The content of the set of questions in this study was provided by " The Research Group of Demand Driven Care, Utrecht University of applied sciences" (references available at request) and based on the concept of 'entrustable professional activities' (EPA's) (43), used in several Dutch medical education programmes (44). EPA's are tasks that should be entrusted only to those individuals who have competence to perform them in a given timeframe and context. Adequate knowledge, skills and attitudes are required (43).

Fourteen EPA's in eHealth to community-dwelling patients (with description), were presented and concerned the roles; a) the nurse as care taker - 10 EPA's , b) the nurse as coordinator of care - 3 EPA's c) the nurse as a coach for colleagues - 1 EPA (45). Fifty-two items per EPA were proposed for competent execution: 15 knowledge items, 9 attitude items and 28 skills items. The skills items were divided into five subsections, respectively; general, technological, clinical, communication and implementation skills.

The instrument was not yet validated.

The first set of questions was pilot tested by four nursing students and five researchers regarding a) the average amount of time required to complete the questionnaire, b) the clarity of items, c) intelligibility of instructions and (d) the adequacy of the format. Small adjustments in formulation were made.

Round 1

The first set of questions aimed to map out characteristics of the experts, gain insight into experts' visions on relevance and the importance of EPA's and KAS, and identify KAS items and EPA's that might have been omitted.

The relevance of the 14 EPA's was examined by the question: how important is this professional task to your opinion? Answers could be scored on a 5-point Likert scale (totally irrelevant, not relevant, relevant, very relevant, essential). Thereafter the importance of items for each 14 EPA's was questioned by the question: What KAS does a nurse in any case need, to be able to carry out this task as an independent professional? Per EPA, a maximum of seven knowledge items, five attitude items and three general, three technological, three clinical, four communication skills and three implementation skills could be selected.

Items reaching the consensus level were retained. Items reaching less than 20% consensus were retained as well for round 2 to be discussed during the expert meeting.

Round 2

The second set of questions aimed to achieve more consensus and was sent to all experts with a) one question about the experts' quality b) agreed items per EPA and c) per EPA the items scored between 20% - 80%. Group scores/percentages per items were presented. Extra items proposed by experts were added.

Experts were asked to rate the importance of items, scored between 20% and 80%, on a 5-point Likert scale (irrelevant, not relevant, neither relevant, relevant, essential). This method was repeated for each of the 14 EPA's. At the end of the questionnaire comments could be made.

Round 3

The expert meeting, aimed to discuss the findings from the previous rounds and attain consensus from a 3 hours' workshop. Experts received a hand-out at the start; selected items per EPA were presented in green and not selected items in red. A chairman using a roadmap was in charge during the expert meeting. The meeting had three phases; 1) discussion of EPA's proposed by experts in round 1. (2) Thereafter an additional KAS from round 1 were presented. Experts were requested to suggest these items when it seemed appropriate to an EPA. (3) Then not selected (=red) knowledge, attitude and skills items per EPA's could be proposed from the hand-out, to be admitted in the final (green) KAS list. Proposals were then discussed.

After each discussion, experts gave their final anonymous judgment; a *yes* or a *no*, via a voting device. This process was repeated for each of the 14 EPA's. Discussions were

audio-recorded for analysis to prevent that no data was lost. Permission for recording was asked.

Ethical considerations

The approached member of the ethics committee waived the need for approval for this study. Willingness to participate was given when the experts had given oral or on-line consent before the start of the study or by response to the first questionnaire.

Data analysis

Data analysis was performed using Statistical Package for Social Sciences (SPSS, version 22.0, IBM, Armonk, NY).

Frequencies in round 1, 2 and 3 were calculated to determine the number of KAS items that reached consensus after each round. In round 2 the Mann-Whitney *U*-test was used to reveal significant differences between lecturers and nurses. We used a nonparametric test because parametric assumptions were not met. After round 3, audio recordings were transcribed. Audio recordings, field notes and expert comments from the handouts were analysed by the first and second author. The qualitative data were read, content analysed and combined with similar meaning units into codes and then transformed into themes.

RESULTS

Participants

Initially, 49 experts consented with regards to participation, fifty-one experts responded to round 1 (106%), 37 experts (73%) completed round 1. One patient expert was lost because the questionnaire was too complicated. The characteristics of the experts are presented in Table 1. The experts appeared were representatives of the field of investigation. They represented various organisational, educational and professional contexts from all-over the Netherlands, and were experienced in eight eHealth applications, whereby video conferencing, social alarming, life style monitoring and telemonitoring, for more than 6 months to more than 10 years.

Forty-eight experts received a questionnaire for round 2 because answers to the questionnaire were anonymous. Response rates in round 2 were 68%. Six respondents were lost after the first question, these cases were not counted. Forty-eight experts were invited for round 3 of whom 25 (52%) participated (Table 2/ Fig.1).

Round 1

Consensus was reached regarding the relevance of the proposed EPA's, 92-100% (Table 3), although EPA 1 and 2 had a lower score of 86,3% and 80,3% respectively.

Twenty-five of 728 items (= 14 EPA's x 52 KAS items) reached the consensus level. Of these 25 items, analytic and coaching skills were frequently chosen.

From the open-ended questions in round 1, 18 additional items were identified: four knowledge, three attitude and 11 skills items, to be judged for consensus in the subsequent rounds. Six items were proposed for EPA one. Two EPA's and two items not associated with an EPA were proposed and passed over to be discussed in the expert meeting.

Outcomes were corrected for missing values.

Round 2

In the second round, consensus was reached for more than 10 items per EPA. We compared the selection of items between lecturers and nurses and found significant differences ($P = <0,05$ (Table 5)) between groups. Nurses scored consensus on 16 items but the total group score was below consensus level. Of these unselected items, eight concerned implementation skills. All 16 items were retained to be discussed in round 3.

Ten of 18 additional items proposed by experts in round 1, reached the consensus level (Table 4, items in italic).

Round 3

Three additional experts, present on the basis of their long-term expertise in eHealth but not entitled to vote, participated in the discussion.

EPA 1 and 2 were discussed because of their relative lower scores and were revised. EPA 1 reached consensus at 82%. A distinction was made between a user problem and a technical problem, the nurse should be able to recognise the difference. EPA 2 reached consensus at 91% after, 'being responsible for' was changed to 'informs ...' (Table 3).

Proposed additional EPA's from round 1, were not selected as new EPA's. These activities were seen as conditions. Subsequently, 14 EPA's and items were discussed and consensus was reached on two more items. Items that differed significantly between nurses and lecturers in round 2 were discussed but not selected. Table 3 summarises knowledge, attitudes and skills (Table 4) finally selected per EPA.

Most selected items ($\geq 8-13$) are communication skills, clinical knowledge, an supportive attitude, an ethical awareness, analytical skills to solve problems, coaching skills and the ability to effectively combine clinical experience with eHealth in decision-making.

Qualitative data results.

Through a process of content analysis and thematic coding from discussions, paper comments and field notes, eight themes emerged, which could be further grouped into three categories; a) Technique responsibilities concern problem solving, ethical awareness and lifelong learning. b) Educational responsibilities concern tailored care, supporting autonomy and consultation and c) Clinical responsibilities concern clinical reasoning and basic nursing competence in eHealth use (Table 6). These responsibilities include knowledge, attitudes, clinical and implementation skills and confirmed the findings of the quantitative analysis.

DISCUSSION

Principal findings

This study suggests that at least 10 KAS items are required for nurses to provide eHealth to community-dwelling patients. Communication skills, clinical knowledge, a supportive attitude, an ethical awareness, analytical skills to solve problems, coaching skills and the ability to effectively combine clinical experience with eHealth in decision-making seem essential. Moreover, consensus is achieved about 14 professional activities in the use of eHealth for community-dwelling patients, that could be entrusted to trained professionals.

Our findings expand on those of Barakat et al.(12), Gifford et al.(33) and Hawkins (46), confirming that ethical awareness and communication are important, as well as competencies in evidence informed decision making and informatics to foster patients' willingness to use eHealth (47). Lu et al.(47) found that eHealth care enhanced patients' ability to play an active role in disease management and health behaviour, patients are willing to adopt the role of diagnostic agent (48). This is consistent with the importance of 'supporting autonomy' (Table 5). However an empowering attitude, coaching skills and communications skills are all important conditions for success (48). The importance of 'basic nursing competence' for applying eHealth is already acknowledged (22).

The item 'knowledge about costs', did not reach the consensus level although this item is considered important to the patient (47,49,50) and the nurse (51) in other studies, to enhance eHealth.

The main strength of this research is the broad and systematic exploration of professional experiences with several eHealth applications in homecare settings. Therefore, findings are not limited to a specific application but highlight the key EPA's for nursing practice and indicate a direction for education. This is the only study, to our

knowledge, that has gathered detailed knowledge, attitude and skills items about practice users.

The high consensus level of 80% (40) forced experts to be specific about requirements regarding the application of a specific EPA. As commented by an expert: '*You have a tendency to think that everything is important. (consenting sounds), but distinction must be made concerning the context of the EPA*'.

Another strength is the guaranteed anonymity during three rounds, even in the expert-meeting by the use of voting devices.

However, some limitations are noteworthy. We were unable to find the proposed patients to participate in the study. Nurses predicted difficulties for the patients to finish 3 rounds, associated with the illnesses of patients and symptoms of fatigue and cognitive impairment.

Furthermore, incomplete cases in round 1 and 2 might have been caused by the length and complexity of the sets of questions that exceeded the indicated time. One expert noted: '*This questionnaire is a monstrosity*'. As Keeney et al. (52) state, "Being subjected to answering the same question time again, with minimal or no interaction among members and participation reduced to statistical summaries, can be testing for anyone".

We might have planned more time for the expert meeting. Experts were very concerned and discussed as much as possible in the 3 hours timeframe. Comments were made about descriptions of EPA's, which made multiple interpretation possible and caused confusion without time for revision.

Although our sample size was small and may be considered a limitation in this study, there is little agreement about the sample size of expert panels (35,37,38). Representativeness, is assessed by the qualities of the experts (39). Expert responses add to knowledge about what care activities might be performed by nurses from home care services and which KAS they ought to have to execute quality of eHealth care.

Practical relevance.

The results of this study indicate a preliminary direction for education and assessment. The explicitness of critical tasks and KAS accommodate transparency and by that as a guide to support curriculum planning (53). Achieved consensus may contribute to a more uniform education and adequate training.

When eHealth EPA's and KAS could be implemented into a nursing curriculum, nursing students gain more insight into the opportunities of eHealth in homecare services and can be trained as skilled professionals before entering practice. Conceptions of work

enables a likelihood of achieving competence development (54). Furthermore our findings might be used to educate, teach and assess registered nurses at home care institutions to adapt to new technologies and changes in professional responsibilities. Insight can serve as a source of reflection for self-development, and as a statement regarding the kind of service and relationships that patients can expect (55). This might lead to competently utilising eHealth and implementation success (22).

CONCLUSION

We uncovered knowledge, attitudes and skills needed to execute entrustable eHealth tasks for nurses in homecare settings to community-dwelling patients. The comprehensive and systematic approach in this study provides a transparent view of what might be taught about eHealth in homecare settings to students in a bachelor nursing curriculum.

Recommendations

However more discussion and research is needed. Validity of the EPA's should be judged by patients and professionals *and* the associated knowledge, attitude and skills items which need to be combined into competencies (38,39). Generalisability and usability for other settings need to be examined. The findings have potential to enhance eHealth use in nursing practice, they are promising.

ACKNOWLEDGMENTS

We would like to thank the following institutions for participation by the experts who volunteered for this study. Universities of applied sciences: Hanze Hogeschool, Haagse Hogeschool, Hogeschool Rotterdam, Hogeschool Utrecht, Hogeschool Windesheim, Hogeschool Zuyd. Homecare institutions: Beweging 3.0, Careyn, Eveen, Sensire, Thebe, Vierstroom, de Zorgcentrale, Zuidzorg. eHealth providers: Boomerweb, Curit, Focuscura, Mextal, Verklizan. We also thank Vera Jagers, Maria-Lotte Haagsman, Conny van Ruitenbeek and Romy van Ruitenbeek for their feedback, which contributed to the final version of the first questionnaire.

This article presents independent research. The views expressed in this publication are those of the author(s).

Authors' Contributions

AHM conducted the survey, undertook the analyses, and wrote the first draft of the paper. CTMvH supervised the analyses of the survey and developed the survey questionnaire with contributions from AHM. Study process was under the overall guidance of HSMK.

REFERENCES

- (1) World Health Organization. Interesting facts about aging. 2012; Available at: <http://www.who.int/ageing/about/facts/en/index.html>. Accessed Sep/13, 2013.
- (2) World Health Organization. Global action plan for the prevention and control of noncommunicable diseases 2013-2020 [Internet]. 2013. Available at: http://apps.who.int/iris/bitstream/10665/94384/1/9789241506236_eng.pdf?ua=1
- (3) International Labour Office. World Social Protection Report 2014/15. Building economic recovery, inclusive development and social justice. 2014; Available at: http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_245201.pdf. Accessed June/22, 2014.
- (4) Maurits EE, de Veer AJ, Francke AL. NIVEL. [Pressure of work and job satisfaction of interest to continue to retirement]. 2012; Dutch. Available at: <http://www.nivel.nl/sites/default/files/bestanden/Factsheet-Arbeidsomstandigheden-en-doorwerken-tot-65.pdf>. Accessed June /22, 2014.
- (5) Mattke S, Klautzer I, Mengistu T, Garnett J, Hu J, Wu H. Health and well-being in the home. A global analysis of needs, expectations, and priorities for home healthcare technology. 2010; Available at: http://www.rand.org/content/dam/rand/pubs/occasional_papers/2010/RAND_OP323.pdf. Accessed June/22, 2014.
- (6) European Commission. Communication from the commission to the European Parliament, the council, the European economic and social committee and the committee of the regions eHealth Action Plan 2012-2020. 2012; Available at: <http://ec.europa.eu/digital-agenda/news/report-public-consultation-ehealth-action-plan-2012-2020>.
- (7) Pols J. The heart of the matter. About good nursing and telecare. *Health Care Anal* 2010 Dec;18(4):374-388. doi: 10.1007/s10728-009-0140-1.
- (8) Kort HSM, Van Hoof J. Telehomecare in The Netherlands: Barriers to implementation. *International Journal of Ambient Computing and Intelligence* 2012;4(2):64-73. doi: 10.4018/jaci.2012040105.

-
- (9) Ten Have L, Kessler N. ZZG zorggroep. [Research report: experiences of nurses and caretakers with care-on-distance in home care]. 2011; Dutch. Available at: http://www.kcwz.nl/doc/zorg_en_technologie/Onderzoeksrapport_Ervaringen_van_verpleegkundigen_en_verzorgenden_met_ZOA.pdf. Accessed June /22, 2014.
- (10) Flim C. Nictiz. [Remote care, perspective of professionals in chronic care. An exploration.]. 2009; Dutch. Available at: <http://www.venvn.nl/LinkClick.aspx?fileticket=KokF1G4AfOY%3D&tabid=3299>. Accessed June/22, 2014.
- (11) Flim C. ZonMW. [Action Plan, eHealth implementation research]. 2013; Dutch. Available at: http://www.zorgvoorinnoveren.nl/uploads/knowledge/document/Actieplan_ehealth_implementationonderzoek_april_2013.pdf. Accessed June/22, 2014.
- (12) Barakat A, Woolrych R, Sixsmith A, Kearns W, Kort H. Health professionals competencies for e-health technology to age in place - outcomes of a to-day collaborative workshop. *Med 2.0* 2013;2(2) e10. doi:10.2196/med20.2711.
- (13) International Council of Nursing. Nursing matters. Telenursing. 2009; Available at: http://www.icn.ch/images/stories/documents/publications/fact_sheets/18b_FS-Telenursing.pdf. Accessed June/22, 2014.
- (14) van Velzen L, Nijhof N, Kulyk O. Health 2.0: new technologies. In: van Gemert-Pijnen JE, Peters O, Ossebaard HC, editors. *Improving eHealth*. 1st ed. The Hague: Eleven International Publishing; 2013. p. 111-126.
- (15) Field, M.J. & Grigsby, J. Telemedicine and remote patient monitoring. *JAMA* 2002;288(4):423-425. doi: 10.1001/jama.288.4.423.
- (16) Edirippulige S. Readiness of nurses for practicing telehealth. *Stud Health Technol Inform* 2010;161:49-56. doi:10.3233/978-1-60750-659-1-49.
- (17) Turvey C, Coleman M, Dennison O, Drude K, Goldenson M, Hirsch P, et al. ATA practice guidelines for video-based online mental health services. *Telemed J E Health* 2013 Sep;19(9):722-730. doi:10.1089/tmj.2013.9989.

-
- (18) While A, Dewsbury G. Nursing and information and communication technology (ICT): a discussion of trends and future directions. *Int J Nurs Stud* 2011 Oct;48(10):1302-1310. doi: 10.1016/j.ijnurstu.2011.02.020.
- (19) Edirippulige S, Smith AC, Beattie H, Davies E, Wootton R. Evaluation of nursing students' knowledge, understanding and readiness to practice e-health. *J Telemed Telecare* 2007;13:37-39. doi: 10.1258/135763307783247284.
- (20) European Commission. Information Society and Media Directorate-General. Report on the public consultation on eHealth Action Plan 2012-2020. 2011; Available at: <http://ec.europa.eu/digital-agenda/news/report-public-consultation-ehealth-action-plan-2012-2020>. Accessed June/22, 2014.
- (21) Royal College of Nursing. Positioning nursing in a digital world. RCN eHealth survey report. 2013; Available at: http://www.rcn.org.uk/__data/assets/pdf_file/0020/530390/004_440.pdf. Accessed June/22, 2014.
- (22) Grady JL, Schlachta-Fairchild L. Report of the 2004-2005 International Telenursing Survey. *Comput Inform Nurs* 2007 Sep-Oct;25(5):266-272. doi:10.1097/01.NCN.0000289163.16122.c2.
- (23) Gagnon MP, Orruño E, Asua J, Ben Abdeljelil A, Emparanza J. Using a modified technology acceptance model to evaluate healthcare professionals' adoption of a new telemonitoring system. *Telemed J E Health* 2012;18(1):54-59. doi: 10.1089/tmj.2011.0066.
- (24) Booth RG. Educating the future eHealth professional nurse. *Int J Nurs Educ Scholarsh* 2006;3:Article 13. PMID:16646940[PubMed - indexed for MEDLINE].
- (25) Glinkowski W, Pawlowska K, Kozłowska L. Telehealth and telenursing perception and knowledge among university students of nursing in poland. *Telemed J E Health* 2013 Jul;19(7):523-529. doi: 10.1089/tmj.2012.0217.
- (26) Hardisty AR, Peirce SC, Preece A, Bolton CE, Conley EC, Gray WA, et al. Bridging two translation gaps: a new informatics research agenda for telemonitoring of chronic disease. *Int J Med Inform* 2011 Oct;80(10):734-744. doi: 10.1016/j.ijmedinf.2011.07.002.

-
- (27) van Houwelingen T. Verklizan. Assistive Living Technology education in Western Europe. In: Acceptance of Assisted Living Technologies in European countries. Analysis of the major difference in the adoption rates of Assisted Living Technologies across Europe. Available at:
http://www.verklizan.com/content/fileadmin/Documentation/Other/Acceptance_of_Assisted_Living_Technologies_in_Europe__final_report_022014_.pdf.
- (28) Clark J, Baker B, Baker D. Getting eHealth into basic nursing education: report of the RCN information in nursing project. *Stud Health Technol Inform* 2009;146:534-539. doi: 10.3233/978-1-60750-024-7-534.
- (29) World Health Organization. Consultation on human resources for health for high income countries. Preparatory meeting for the Third Global Forum on HRH. Meeting report 4-5 September 2013. 2013.
<http://www.who.int/workforcealliance/knowledge/resources/OsloHRHconsultationReport.pdf?ua=1>.
- (30) World Health Organization and International Telecommunication Union. National eHealth Strategy Toolkit. 2012;ISBN 978 92 4 154846 5 (WHO). Available at:
http://www.itu.int/dms_pub/itu-d/opb/str/D-STR-E_HEALTH.05-2012-PDF-E.pdf.
- (31) van Merwijk C. V&VN. [Professional Nursing Profile. Nurses & caretakers 2020. Part 3]. 2012; Dutch. Available at:
http://www.venvn.nl/LinkClick.aspx?fileticket=FZhPgDg_3n8%3D&tabid=5302. Accessed June/22, 2014.
- (32) Fernandez N, Dory V, Ste-Marie LG, Chaput M, Charlin B, Boucher A. Varying conceptions of competence: An analysis of how health sciences educators define competence. *Med Educ* 2012;46(4):357-365. doi: 10.1111/j.1365-2923.2011.04183.x.
- (33) Gifford V, Niles B, Rivkin I, Koverola C, Polaha J. Continuing education training focused on the development of behavioral telehealth competencies in behavioral healthcare providers. *Rural Remote Health* 2012;12:2108. (Online). Available: <http://www.rrh.org.au>.
- (34) Dattakumar A, Gray K, Maeder A, Butler-Henderson K. Ehealth education for future clinical health professionals: an integrated analysis of Australian expectations and challenges. In: Lehmann CU, Ammenwerth E, Nøhr C, editors. Series: Studies in Health

Technology and Informatics Proceedings of the 14th World Congress on Medical and Health Informatics 2013;192:954. doi: 10.3233/978-1-61499-289-9-954.

(35) de Villiers MR, de Villiers PJ, Kent AP. The Delphi technique in health sciences education research. *Med Teach* 2005 Nov;27(7):639-643. doi:10.1080/13611260500069947.

(36) Faes MC, Reelick MF, Esselink RA, Rikkert MG. Developing and evaluating complex healthcare interventions in geriatrics: the use of the medical research council framework exemplified on a complex fall prevention intervention. *J Am Geriatr Soc* 2010 Nov;58(11):2212-2221. doi: 10.1111/j.1532-5415.2010.03108.x.

(37) Keeney S, Hasson F, McKenna H. A critical review of the delphi technique. *Int J Nurs Stud* 2001;38(2). doi:10.1016/S0020-7489(00)00044-4.

(38) Keeney S, Hasson F, McKenna H. Consulting the oracle: ten lessons from using the Delphi technique in nursing research. *J Adv Nurs* 2006 Jan;53(2):205-212. doi:10.1111/j.1365-2648.2006.03716.x.

(39) Powell C. The Delphi technique: myths and realities. *J Adv Nurs* 2003 Feb;41(4):376-382. doi: 10.1046/j.1365-2648.2003.02537.x.

(40) Diamond IR, Grant RC, Feldman BM, Pencharz PB, Ling SC, Moore AM, et al. Defining consensus: a systematic review recommends methodologic criteria for reporting of Delphi studies. *J Clin Epidemiol* 2014 Apr;67(4):401-409. doi: 10.1016/j.jclinepi.2013.12.002.

(41) Pols J, Willems D. Innovation and evaluation: taming and unleashing telecare technology. *Sociol Health Illn* 2011 Mar;33(3):484-498. doi: 10.1111/j.1467-9566.2010.01293.x.

(42) Eskes AM, Maaskant JM, Holloway S, van Dijk N, Alves P, Legemate DA, et al. Competencies of specialised wound care nurses: a European Delphi study. *Int Wound J* 2013 Feb 4. doi: 10.1111/iwj.12027. [Epub ahead of print].

(43) ten Cate O. Entrustability of professional activities and competency-based training. *Med Educ* 2005 Dec;39(12):1176-1177. doi: 10.1111/j.1365-2929.2005.02341.x.

-
- (44) ten Cate O, Snell L, Carraccio C. Medical competence: the interplay between individual ability and the health care environment. *Med Teach* 2010;32(8):669-675. doi: 10.3109/0142159X.2010.500897.
- (45) Pool A, Pool-Tromp C, Veltman-van der Vugt F, Vogel S. [Main roles]. In: [Focus on the future. Professional competencies for nursing students at Universities of applied sciences]. 7th edition, Aug 2003 ed. Utrecht: NIZW Uitgeverij; 2001. p. 44-48. Dutch.
- (46) Hawkins SY. Telehealth nurse practitioner student clinical experiences: an essential educational component for today's health care setting. *Nurse Educ Today* 2012 Nov;32(8):842-845. doi: 10.1016/j.nedt.2012.03.008. 3.
- (47) Lu JF, Chi MJ, Chen CM. Advocacy of home telehealth care among consumers with chronic conditions. *J Clin Nurs* 2014 Mar;23(5-6):811-819. doi: 10.1111/jocn.12156.
- (48) Oudshoorn N. Diagnosis at a distance: the invisible work of patients and healthcare professionals in cardiac telemonitoring technology. *Sociol Health Illn* 2008;30(2):272-288. doi: 10.1111/j.1467-9566.2007.01032.x.
- (49) Cimperman M, Makovec Brenčič M, Trkman P, de Leoni Stanonik M. Older adults' perceptions of home telehealth services. *Telemed J E Health* 2013;19(10):786-790. doi:10.1089/tmj.2012.0272.
- (50) Peeters JM, De Veer AJE, Van der Hoek L, Francke AL. Factors influencing the adoption of home telecare by elderly or chronically ill people: A national survey. *J Clin Nurs* 2012;21(21-22):3183-3193. doi: 10.1111/j.1365-2702.2012.04173.x.
- (51) van Houwelingen T, Barakat A, Antonietti A, Kort H. Using the unified theory of acceptance and use of technology to explore predictors for the use of telehomecare by care professionals. *Assistive technology: from research to practice: IOS Press Ebooks*; 2013. p. 1223-1228.
- (52) Keeny S, Hasson F, McKenna H. Debates, Criticisms and Limitations of the Delphi. *The Delphi technique in nursing and health research: Wiley Online Library*; 2010. p. 18-31. doi 10.1002/9781444392029.ch2.

(53) Mulder H, ten Cate O, Daalder R, Berkvens J. Building a competency-based workplace curriculum around entrustable professional activities: The case of physician assistant training. *Med Teach* 2010;32(10):e453-e459. doi: 10.3109/0142159X.2010.513719.

(54) Sandberg J. Understanding human competence at work. An interpretative approach. *Acad Manage J* 2000 Feb;43(1):9-25. doi: 10.2307/1556383.

(55) Lakeman R. Mental health recovery competencies for mental health workers: a Delphi study. *J Ment Health* 2010;19(1):62-74. doi: 10.3109/09638230903469194.

Figure I: Flowchart Design

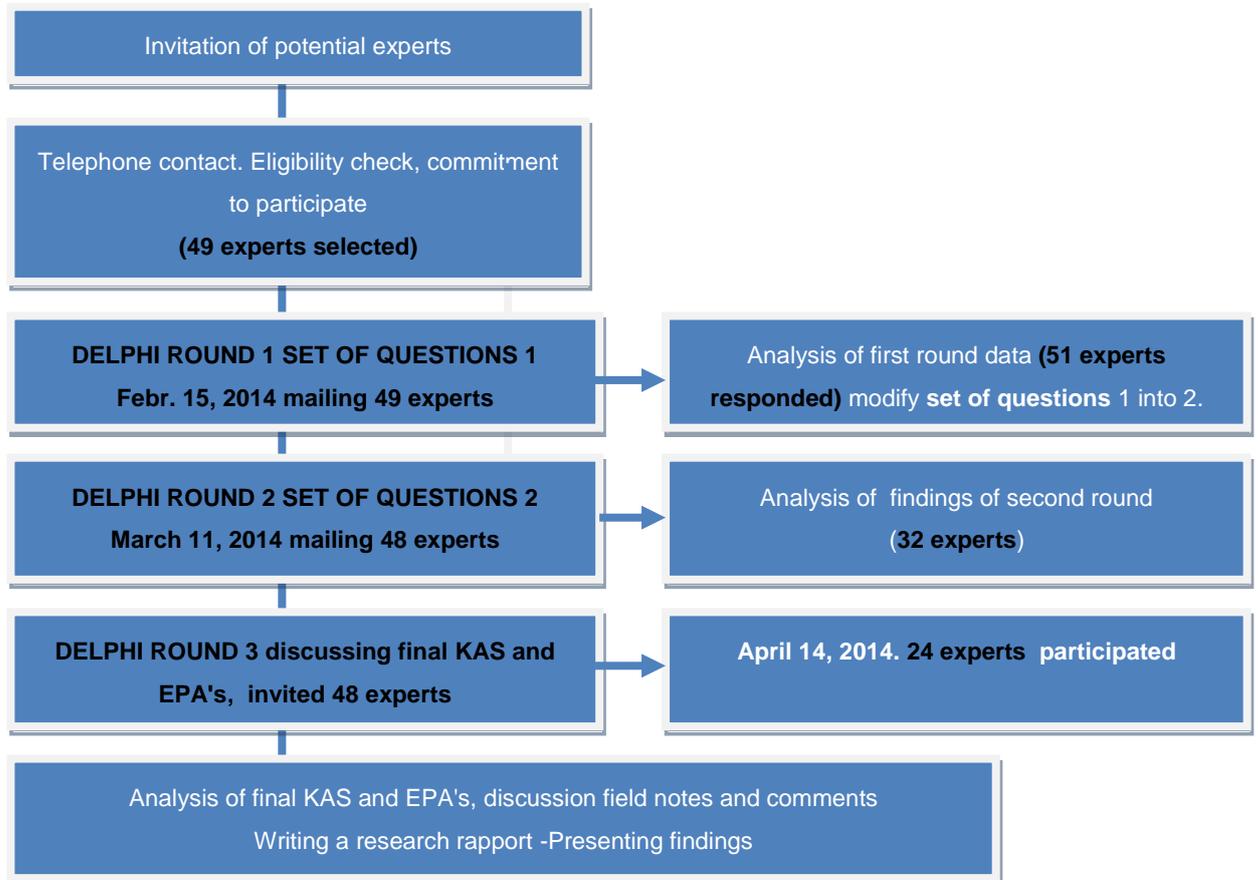


Table 1: Round1. Demographic characteristics

		Lecturers N=12	Providers N = 5	Nurses N=32	Patients N=2
Year of birth	1935-1951				100%
	1952 -1961	25%	60%	34,4%	
	1962 -1971	50%	20%	12,5%	
	1972 -1981	25%		12,5%	
	1982-1991		20%	40,6%	
Gender	Male	41,7%	80%	15,6%	100%
	Female	58,3% ⁷	20%	84,4%	
Education level	Low			3,1%	50%
	Higher education/ Vocational		20%	18,6%	
	Applied science	18,7%	40%	68,8%	50%
	Scientific	83,3%	80%	9,4%	
Experience time with eHealth	1 year			28,1%	50%
	1-4 years	33,3%	40%	56,3%	50%
Experts are experienced with	4-10 years	50%	20%	412,5%	
	> 10 years	16,7%	40%	3,1%	
Experts are experienced with	Social alarming	33,3%	60%	83,3%	
	Video conferencing	75%	80%	93,8%	100%
	Life style monitoring	50%	60%	9,4%	
	Telemedicine	16,7%	60%	40,6%	
	Robotics	18,3%			
	On-line anamnesis		20%		
	EMR	8,3%			
Smartphone to support collegea	8,3%				

Table 2: Participation in the study

	Experts	Lecturers	Providers	Nurses	Patients	Total
Round						
Proposed	10 (20%)	5 (10%)	20 (40%)	15 (30%)	50	
Selected/invited	13 (27%)	6 (13%)	26 (54%)	3 (6%)	48	
Round 1	12 (24%)	5 (10%)	32 (63%)	2 (4%)	51	
Round 2	7 (22%)	3 (9%)	20 (63%)	2 (6%)	32	
Round 3	9 (36%)	3 (12%)	13 (52%)	0	25	

Table 3. EPA's and selected KAS.

Role	KAS	Relevance score EPA	Knowledge	Attitudes	General skills	Technological skills	Clinical skills	Commun. skills	Implem. skills
care taker	EPA. The Nurse:								
	1. Supports the patient to trust and understand the eHealth technology (revised)	(82%)	2, 8, 13	1, 3, 8, 11, 12	1, 4	1, 2	4	1, 2,3	1
	2. Informs patients about the possibilities of technology to enhance their social network (revised)	(91%)	6,9	1, 3, 4, 7, 10	4	2,3, 4		2, 3	2, 3
	3. Provides health education by eHealth technology	(98%)	1,6, 10, 11	1, 4, 5, 8	4	4	4	2, 4, 5	1, 4
	4. Triage on incoming calls and alarming signals	(100%)	1, 2, 3,12	3,5, 8	1, 2		1, 2, 4, 6	1, 2, 5	
	5. Analyses and interprets incoming data from self-measurements and automatic controls	(100%)	1, 2, 3	2, 3	1	1	1, 2, 3	1, 2	
	6. Monitors vital functions and lifestyle by videoconferencing	(92%)	1, 2, 5,	1, 2	1	6	1, 2, 4	1, 2, 4, 5	
	7. Provides psychosocial support by videoconferencing	(94%)		1, 3, 4, 5, 8	3,4		4	2, 4, 5, 6	
	8. Encourages patients to undertake health promotion activities by videoconferencing	(100%)	1, 9	1	1,4	2	2, 4, 5	2, 5, 8	2
	9. Provides instruction to patients or caregivers to implement self-care through videoconferencing	(98%)	1, 3	1, 3, 5, 8	1,4	2	4	2, 3, 4, 5	
coordinator	10. Recruits patients who are eligible for the use of eHealth technologies	(93%)	3, 6, 8, 9	1, 7, 9	4			2, 3	1, 2, 3
	11. Evaluates and reviews the care process by videoconferencing	(92%)	1	1, 5	1	5	3, 5	1, 2, 5	
	12. Coordinates the care process by using eHealth technologies	(94%)	4, 6, 7, 8	5, 6	1, 2		1, 2, 3	1, 2, 7	
coach	13. Uses a double-check of colleagues via video communication technology	(98%)	1, 2, 4, 7, 8	5	2, 3		2, 3	1	
	14. Supports a colleague or gives a consult to a colleague by videoconferencing	(94%)	1, 4, 7, 8	4, 5	1, 4	3, 4	2, 3	1, 2, 4	

Note: Numbers represent knowledge, attitudes and skills (KAS), as defined in table 4

Table 4. Selected KAS for the use of eHealth in different EPA's.

KNOWLEDGE		Selection Frequency
1	Clinical knowledge	9
2	Knowledge of the procedure: what to do in case of an emergency	5
3	Knowledge of the (clinical) limitations of eHealth technology	4
4	Knowledge of how technology can be used in sharing information with colleagues	3
5	Knowledge of how to collect health-related data for patient monitoring	1
6	Knowledge of how eHealth technology can be deployed in existing pathways	4
7	Knowledge of laws and regulations concerning the protection and exchange of medical data , eg data protection, informed consent and confidentiality	3
8	Knowledge of policies, procedures and protocols of the organisation about the deployment of eHealth technologies	5
9	Knowledge of the potential benefits of eHealth technologies	2
10	Insight into which sources patients like to use to find information about their disease	1
11	Insight into the reliability of health information on the web	1
12	<i>Knowledge of relevant protocols (extra)</i>	1
13	<i>Knowledge about what to do if the technology does not work (extra)</i>	1
ATTITUDES		
1	Has an attitude aimed to support (self-management / empowerment), encourages patients to play an active role in their treatment	9
2	Encourages the use of electronic measurement devices for the collection of detailed patient information	2
3	Is patient	6
4	Is able to promote privacy and confidentiality in videoconferencing	4
5	Uses an ethically correct attitude during videoconferencing (honesty, confidentiality, personal and professional integrity)	8
6	Promotes the importance of a unified way of analysing and sharing clinical information to improve the quality of data and the quality of care	2
7	Has confidence that eHealth technology is not difficult to use	1
8	Can convey empathy through videoconferencing by facial expression and verbal communication	5
9	Is open minded to innovations in ICT (taking into account the importance of protecting confidentiality)	1
10	<i>Motivational attitude (extra)</i>	1
11	<i>Remains calm, friendly and analytic towards the patient when troubleshooting (extra)</i>	1
12	<i>Is able to enhance confidence of the patient in the deployed technology (extra)</i>	1
SKILLS GENERAL SKILLS		
1	Analytical skills : is able to think creatively to solve problems	8
2	Is able to prioritize and switch quickly between different patients and different requests for help	3
3	Protects the privacy of self and the patient in the use of eHealth technologies (compliance to ethical, legal and regulatory considerations)	2
4	Coaching skills	8
TECHNOLOGICAL SKILLS		
1	Is able to check equipment for functionality	2
2	Is able to train the patient to use the equipment	4
3	Technological skills in the field of new technology	2
4	Basic ICT skills, such as the use of the Internet and a personal computer	3
5	<i>Is able to use electronic health records (extra)</i>	1
6	<i>Is able to check equipment on functionality (extra)</i>	1
CLINICAL SKILLS		
1	Is able to use health-related data effectively in patient care; (a) is able to measure, compare, group and interpret data	4
2	Is able to combine clinical experience effectively with eHealth technology in decision-making	8
3	Is able to use health-related data effectively in patient care; (b) presents patient data clearly to colleagues	6
4	Observation Skills: interprets non-verbal and verbal expressions in the right way when videoconferencing	7
5	Is able to compose a risk prevention plan to support patients'safe independent living	2

6	<i>Triage and clinical reasoning skills (extra)</i>	1
COMMUNICATIVE SKILLS		
1	Is focused in communication and able to reveal patients problem by specified questions	7
2	Communication skills : is able to listen, ask focused questions to the patient, paraphrasing and summarising at reluctant responses	13
3	Is able to put patients at ease when they feel insecure about using technology	4
4	Is able to communicate clearly in videoconferencing and knows what to do to enhance contact (use of voice, light, background , etc.)	5
5	Empathy: is able to recognize (at a distance) , the needs of the patient and care situation	6
6	Is able to create a confidential environment and a pleasant atmosphere in video conferencing	1
7	<i>Is able to communicate across different disciplines (extra)</i>	1
8	<i>Motivational techniques (extra)</i>	1
IMPLEMENTATION SKILLS		
1	Is able to assess whether eHealth technology is convenient for the patient by the use of established criteria (for example, cognitive ability, technological skills)	3
2	Is able to assess the needs and preferences of the patient with respect to (eHealth) technology	3
3	Is able to communicate effectively the benefits of eHealth technologies	2
4.	Is able to provide advice about reliable health information on the internet; sites, medical care portals and mobile applications	1

Note:

Selected knowledge, attitudes and skills (KAS) to execute various EPA's, see Table 3.

Items in italic are proposed by experts in round 1.

Soft red items are most frequently selected by the experts.

Table 5. Round 2. Comparison between lecturers and nurses: Items that reached no consensus and differ significantly

EPA	KAS	Item	Exact sig. [2*(1-tailed sig.)] P value	Nurses percentage	Lecturers percentage
1. Supports the patient to trust and understand the eHealth technology (revised)	Attitude	Uses an ethically correct attitude during videoconferencing (honesty, confidentiality, personal and professional integrity)	0,005	85%	28,6%
	Implementation skills	Is able to implement new eHealth technologies in daily practice	0,001	85%	14,3%
	Implementation skills	Is able to effectively communicate the benefits of eHealth technologies	0,005	95%	28,6%
	Implementation skills	Is able to assess the needs and preferences of the patient with respect to (eHealth) technology	0,031	90%	90%
2. Informs patients about the possibilities of technology to enhance their social network (revised)	Attitude	Is open minded to innovations in ICT (taking into account the importance of protecting confidentiality)	0,036	80%	28,6%
	Communicative skills	Is focused in communication and able to reveal patients problem by specified questions	0,016	85%	14,3%
7. Provides psychosocial support by videoconferencing	Implementation skills	Is able to assess the needs and preferences of the patient with respect to (eHealth) technology	0,021	89,4	33
8. Encourages patients to undertake health promotion activities by videoconferencing	Attitude	Is patient	0,043	89,5	50
	Communicative skills	Is able to communicate clearly in videoconferencing and knows what to do to enhance contact (use of voice , light , background , etc.)	0,043	84,2	33,3
	Implementation skills	Is able to communicate effectively the benefits of eHealth technologies	0,001	94,8	16,7
10. Recruits patients who are eligible for the use of eHealth technologies	Technological skills	Technological skills in the field of new technology	0,006	89,4	16,7
	Technological skills	Basic ICT skills, such as the use of the Internet and a personal	0,006	89,4	16,7

		computer			
11. Evaluates and reviews the care process by video conferencing	Implementation skills	Is able to assess the needs and preferences of the patient with respect to (eHealth) technology	0,030	89,5	33,3
12. Co-ordinates the care process by using eHealth technologies	Implementation skills	Is able to implement new eHealth technologies in daily practice	0,007	84,2	16,7
13. Uses a double-check of colleagues via video communication technology	Technological skills	Basic ICT skills, such as the use of the Internet and a personal computer	0,043	89,4	16,7
	Implementations skills	Is able to use organizational facilities and resources for development of eHealth use	0,006	84,2	16,7

Table 6. Round 3. Qualitative findings from discussions, paper comments and field notes.

<i>Responsibilities</i>	<i>Description</i>	<i>Quote</i>
TECHNIQUE RESPONSIBILITIES		
Problem solving.	Knowledge: Nurses need knowledge about how to use eHealth devices, communications skills to unravel and distinguish user problems <i>and</i> if so, support the patient in proper use or refer to a technical helpdesk.	<i>If it's a user problem, you go through how they use it. I always compare it with a washing machine, if it doesn't work, you call a mechanic.</i>
Ethical awareness.	Attitude: Attention for privacy in remote contact, constraint in collecting and storing patient data and secured devices are a condition.	<i>... the nurse 2.0 should have awareness about the legal and ethical aspects of the use of those devices and the safety of open networks. Where are these data stored? Be aware of what I'm saying and write with new technology.</i>
Lifelong learning	Implementation skills: Lifelong learning is considered an obligation for professional nurses. Nurses should have competencies to integrate current developments and innovations into the care process.	<i>The contemporary eHealth technique will be thrown at the waste, in two years time. When it comes to new technologies in general, you should be aware of new developments. ...Yes, keep knowledge (about eHealth devices sic.) up to date to be able to propose creative solutions....</i>
EDUCATIONAL RESPONSIBILITIES		
Tailored Care.	Clinical skills/ implementation skills: The nursing diagnosis should fit the needs of the patient. Health education about the opportunities of eHealth to give freedom of choice, in connection to the needs and the health goals of the patient. The nurse proposes adequate eHealth interventions, including robotics as well, to attain patients health goals.	<i>... you should see it as health education, just as you point patients to alternative therapies, or activities. There is quite a lot in self-management... I think we should be sensitive to see if it (eHealth sic.) fits the patient and his care situation.</i>
Supporting autonomy	Attitude: Nurses should have an empowering attitude, support participation and independence, by information. Patients should be supported to be responsible for; (a) their own health in critical situations, (b) to provide the healthcare professionals with relevant information, (c) adherence to prescriptions and (d) reflection on eHealth use.	<i>... that something is wrong with you is, if there is a critical condition ... Patients should know, you must warn somebody. You're not watched constantly.</i>
Consultation.	Clinical skills: Arguments were given for a fifteenth EPA by distinguishing between; supports a colleague in the use of eHealth <i>and</i> giving or asking a consultation to a colleague by video conferencing concerning patient care.	<i>... and I would prefer to call it guidance, in that you will guide a student or a colleague in working with eHealth applications.... Consult remote, can be about the patient, ... a question to a colleague in the context of patient care. ...</i>

CLINICAL RESPONSIBILITIES

Clinical reasoning	Clinical skills: nurses must be able to combine, interpret and analyse available clinical data and estimate and determine what to do to prevent health risks.	<i>I try to imagine the setting; the patient might not be good enough to determine what's going on ... What disease is he suffering, what drugs does he use, has he previously asked for help. I should know something, before I can do an analysis.</i>
Basic nursing competence	Clinical skills: Competencies for eHealth care seems similar to face-to-face care.	<i>... basic skills should be present, we educate students for the future. I think in 2020, that you're no longer there with basic skills. By then, you should be able to use a wide variety of technical devices.</i>

