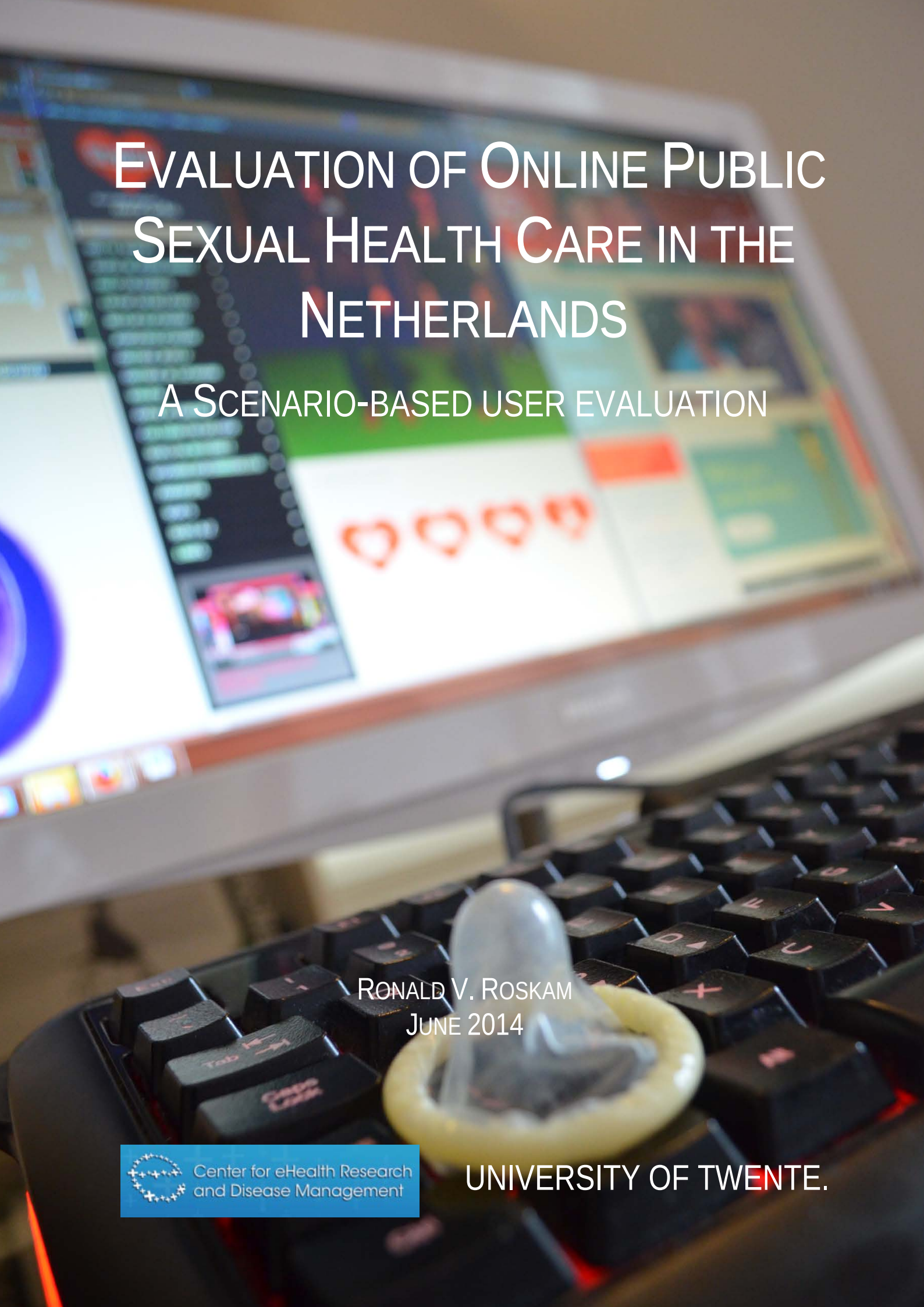

Evaluation of Online Public Sexual Health Care in the Netherlands

A Scenario-based user evaluation

Ronald V. Roskam

June 2014

Center for eHealth Research and Disease Management

University of Twente.

EVALUATION OF ONLINE PUBLIC SEXUAL HEALTH CARE IN THE NETHERLANDS:

A Scenario-Based User Evaluation

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Abstract (English)

BACKGROUND: Various eHealth services are currently available within public sexual healthcare, such as online interventions and other eHealth services. There is little known about the effects and the use of these services. First, evaluation is crucial to tailor eHealth services to the target group. Second, evaluation is necessary to improve existing online eHealth services in public health care. In addition, generic tools en instruments are needed to compare diverse eHealth services.

OBJECTIVE: The main objectives of this research are: (1) to evaluate existing public eHealth interventions for sexual healthcare in the Netherlands and (2) to develop an evaluation checklist to compare diverse eHealth interventions in public healthcare.

METHOD: Study one focusses on a scenario-based user evaluation using Personas and real-time scenarios gathered within Dutch online public sexual health care with young adults between 12 and 25 years old (N=28, mostly between 15-17 years old) and sexual health caregivers (N=2) of the online public sexual health support via chat and email. Study two focuses on the development of an evaluation checklist meant as a handy tool for public health experts to monitor, compare and rate various types of eHealth interventions during the development process. The second study is based on a non-systematic literature analysis and semi-structured interviews (N=5) with eHealth experts, experts in online health care support and project managers of the municipal health services.

RESULTS: Young adults who participated in study one were mainly girls (57.1%), never had sex before (64.4%) were educated within the Dutch VMBO system (50%), were mainly born in the Netherlands (92.9%) and mostly second-generation foreigners (53.6%). Most of the participants never used eHealth services. Results were mixed. Most young adults preferred face-to-face support, family and friends above online support about sexual health. Both young adults and sexual health caregivers rated the eHealth service between 2 and 3 out of five on aspect of usability, perceived system credibility and caregiver communication skills. Young adults preferred face-to-face when there were heavy problems such as abuse and psychotrauma. Sexual health caregivers found that the real essence of the problem was missing and that the conversation were very general.

CONCLUSION: Young adults liked the idea of online public health care, but generally preferred other sources, such as contact with family or professional face-to-face support. Both caregivers and caretakers were very critical and stressed that improvement in terms of therapist skills and interaction is necessary.

SEARCH TERMS: eHealth, online intervention, sexual health care, evaluation methods, CeHRes Roadmap, scenario-based user evaluation, Personas

Abstract (Dutch)

ACHTERGROND: Verschillende eHealth services zijn beschikbaar, zoals bijvoorbeeld online eHealth services in de publieke seksuele gezondheidszorg. Er is weinig bekend over de effecten en het gebruik van deze interventies. Ten eerste is evaluatie cruciaal om eHealth services aan te laten sluiten bij de doelgroep. Ten tweede, evaluatie is cruciaal om bestaande eHealth services te verbeteren. Om verschillende eHealth services te vergelijken zijn aanvullende tool noodzakelijk.

DOELSTELLING: Doel is om 1) de huidige eHealth services in de seksuele gezondheidszorg te en om 2) een praktisch evaluatie checklist te ontwikkelen specifiek voor het evalueren van seksuele eHealth services in de publieke seksuele gezondheidszorg in Nederland.

METHODE: De eerste studie focust op een op scenario's gebaseerde gebruikersevaluatie met jongvolwassenen tussen 12 en 25 jaar (N=28) en zorgverleners binnen de seksuele gezondheidszorg (N=2). Deze evaluatie is gebaseerd op Personas en real-time scenario's van chat en email conversaties uit de online publieke seksuele gezondheidszorg. De tweede studie focust op de ontwikkeling van een evaluatie checklist die bedoeld is als handige tool voor experts in de publieke gezondheidzorg om verschillende online services met elkaar te kunnen vergelijken en beoordelen. . Deze studie is gebaseerd op zowel een non-systematisch literatuurstudie en semigestructureerde interviews (N=5), gebaseerd op de RE-AIM richtlijnen met eHealth experts, experts in online behandeling en project managers van de GGD's.

RESULTATEN: Jongvolwassenen waren in de meeste gevallen meisjes (57.1%), hadden nog nooit seks gehad (64.4%), waren opgeleid op het VMBO niveau (50%), geboren in Nederland (92.9%) en veelal tweedegeneratie allochtonen (53.6%). De meeste jongvolwassenen hebben nooit eHealth services gebruikt. De resultaten zijn gemixt. De meeste jongvolwassenen gaven voorkeur aan een face-to-face gesprek met een hulpverlener, familie en vrienden boven een online chat- of emailservice. Zowel jongvolwassenen als de seksuele zorgverleners beoordelen de eHealth services tussen 2 en 3 uit vijf op aspecten zoals gebruiksvriendelijkheid, waargenomen geloofwaardigheid en communicatievaardigheden van de zorgverlener. Jongvolwassenen gaven de voorkeur aan face-to-face wanneer er sprake was van zware problematiek, zoals mishandeling en psychotrauma. Seksuele zorgverleners waren van mening dat de essentie van de problematiek gemist werd en dat de gesprekken erg oppervlakkig waren.

CONCLUSIE: De online publieke seksuele gezondheidszorg spreekt de deelnemende jongeren aan, maar ze verkozen veelal familie en professionele face-to-face hulpverlening boven online hulpverlening. Zowel zorgvragers als zorgverleners ware kritisch en benadrukten dat verbetering in onder andere de therapeutische vaardigheden en de interactie noodzakelijk is.

ZOEKTERMEN: eHealth, online service, seksuele gezondheidzorg, evaluatiemethoden, CeHRes Roadmap, op scenario gebaseerde gebruikersevaluatie, Personas

Preface

Dear reader,

Welcome to my master thesis written for my graduation for the master of Health Technology Assessment in Health Science. I performed this master research from September 2013 until May 2014 in collaboration with the University of Twente and the National Institute of Public health and Environment (RIVM). In this project I was able to dive into two completely different roles. The first role as a researcher, and the second as an online caretaker within sexual health care. It was very interesting to integrate my knowledge from my work experience at the Centre of Psychotrauma, Mediant GGZ, previous work for the Sense eHealth project at the University of Twente, and the most recent interview study with sexual health experts that delivered several usable Personas for a scenario-based user evaluation. I enjoyed guiding youth in their discovery of the presented scenario's.

Several people have provided support in some way to this thesis. I would like to thank a few of them for their contribution:

- Olga Kulyk. Thank you for your role as my first supervisor, or maybe more, as a colleague in this project. Thank you for your willingness, troubles and time in our collaboration on this project. Without you, this project wouldn't have been what it is now.
- Lisette van Gemert-Pijnen. Thank you for you keen feedback and your role as a second supervisor. Both in this thesis, as earlier on you have provided me with chances to learn and to increase my research skills as student and research assistant at the Centre of eHealth Research & Disease Management.
- From the RIVM I would like to thank Chantal den Daas, Silke David and Ingrid van den Broek for their comments through the process.
- And finally I would like to thank several other people (in random order) who supported this thesis in some or the other way: Anouk Rutten, Huib de Jong, Jouke Ubbink, Saskia Yperlaan, Rabea Rannsman, Angela Yperlaan, Timothy Mets, Meike van 't Holt, Fetzen de Groot, Jolanda Hiemstra, Carlijn Wieten, Sagar Baghoe en zijn collega's van Stichting Alifa, Marieke Bijen, Karlijn Kampman, Floor Sieverink, Femke Koedijk, Kevin Theunissen, Liesbeth Ter Braak, Filippo Zimbile, Marjan Mientjes, Rik Koekenbier and Roos Arends.

I hope I can share the pleasure of this research and I hope that you will enjoy this master thesis,

With kind regards,

Ronald V. Roskam

June 2014

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1. Introduction

1.1 Background

Internet and modern media have become a major mean in public health care (Brouwer et al., 2011). The use of Personal computers and the internet has increased substantially over the last decade, certainly in regard to health seeking behavior (Tu & Cohen, 2008). Users of the internet perceive the medium as an alternative source of information for health problems (Leung, 2008). In a cross-sectional study the internet is found to be the number one source for health-relation information among a Dutch population (Van de Belt et al., 2013). Van de Belt et al. (2013) even conclude that one in four persons wants to communicate with their physician through the use of social media channels.

Evaluation of online technologies is since long a very important part of technology development. Without evaluation, changes could not be made to utilize to end-product and it remains unclear how the product works and what the effects are. Evaluation is done to assess the worth or value of a certain technology or health service (Kahan, 2008) and to improve it (Kulyk, Kosara, Urquiza & Wassink, 2007). Technology evaluation in regard to online health care is more necessary than ever. Although several specific models for evaluation of healthcare technology exist, failures are common in eHealth evaluation (Greenhalgh & Russel, 2010). Examples are escalating costs, lack of effect studies with actual users or stakeholders and data integrity issues (Kreps & Richardson, 2007).

The field of eHealth is adapting to the need for online health support, which resulted in a massive increase in online treatments and concurrent research (Riper et al., 2010; Barak, Klein & Proudfoot, 2009). eHealth is a young and very broad field. It embodies, but is not limited to, for example web-based interventions (Postel, 2011), online chats services (Giorgio, Kantor, Levine & Arons, 2013) and mobile applications (Mulvaney et al., 2013). In this research we yield the definition of Eysenbach (2001) to describe eHealth as '*health services and information delivered or enhanced through the internet and related technologies*' (Eysenbach, 2001, p1). eHealth meant to improve health care through information and communication technology. eHealth is a way of thinking and a view someone could use to reach this goal (Eysenbach, 2001). This research focuses on a specific part of eHealth, namely the evaluation of eHealth services for public sexual health care, in particular, on informative

websites for health education and anonymous online contacts with health care professionals via email and chat services. The focus is not on substantial online treatments such as internet addiction treatment (Winkler, Dörsing, Rief, Shen & Glombiewski, 2013), but on one-time firsthand contacts which aim to refer the caretaker to the professional care such as best suitable online or face-to-face counselling, general practitioner or specialized sexual health care.

1.2 Related work

Related work in online treatment and one-time firsthand contacts show that several successful online interventions are available which give information or establish behavioral change in a diversity of health-related problems. Examples are found in web-based internet addiction treatments (Winkler, Dörsing, Rief, Shen & Glombiewski, 2013), web-based alcohol addiction treatments (Gainsbury & Blasczynski, 2011), internet delivered intervention for recurrent depression (Kordy et al., in press), internet therapies for post-traumatic stress (Kneavelsrud, 2005) and for work-related stress, mild to moderate depression, panic symptoms and bulimic symptoms (Ruwaard, 2012). Different kinds of communication methods are used in these treatments, like for example chat (Subrahmanyan et al., 2004) and email (Postel, 2011). Most of these interventions are protocolled interventions for specific problems or disorders which run in secured web-based environments for a specific amount of time (e.g. three months), where caretakers need to fill in a lot of data before starting off with the a specific tailored treatment. In contrary to online treatments, this research focuses more on first time triage dialogues such as a one-time chat or email. An example is the NHS Direct Online, which is an online extension of a telephone triage system was used by citizens from the United Kingdom to contact a nurse for any kind of health problems (Eminovic, Wyatt, Tarpey, Murray & Ingrams, 2004). These interventions mostly follow straightforward protocols with an introduction phase, an intervention phase and a rehabilitation phase. Evaluation of eHealth is since a couple of years backed-up by the CONSORT-eHEALTH guidelines to structure randomized controlled trials (RCT's)(Eysenbach & CONSORT-eHEALTH group, 2011). Generally, evaluation is difficult. High dropout rates in online treatments are very common (Eysenbach, 2005; Postel et al., 2011; Habibović et al., 2014). In one time chat low respond rates are notorious for online text-posted surveys, resulting in small amounts of data from which conclusions can only be made with caution (Giorgio, Kantor, Levine & Arons, 2013).

In sexual health care most public health research focuses on specific target groups, such as Men who have sex with Men (MSM)(Davidovich, 2006; Gilbert et al., 2013; Pedrana et al., 2013 ;Schafer, Gupta & Dillingham, 2013), sexually transmitted diseases (STD's) like for example Chlamydia Trachomatis (CT) (Lorimer & McDaid, 2013) and HIV (Shapiro & Ray, 2007) and public health programs aimed primarily at youth either directly (McCarthey et al., 2012; Syred, Naidoo, Woodhall & Baraitser, 2014), or through the use of for example parents (Wight & Fullerton, 2013; Van de Bongardt, De Graaf, Reitz & Dekovic, in press). Syred, Naidoo, Woodhal & Baraitser (2014) used Facebook for sexual health promotion. They stress that their site on Facebook did not provide a place for self-sustaining conversation, but a place for single user posts about sexual health. An example is the sexual health website Sexunzipped from the United Kingdom. Through focus groups the researchers interviewed young adults aged 16-22 to explore which elements are appealing and engaging, and what content, design and interactive features are expected by the youth from the website (McCarthy et al., 2012). Participants notably wanted straight forward information about sexual pleasure, STD's and pregnancy. In addition, they expected information about communication with partners. In an RCT they proofed they designed an effective informative website (Bailey et al., 2013). Other examples are a web-based intervention which succeeded in a reduction of perceived norms of college students about alcohol use and sexual behavior (Patrick, Lee & Neighbors, 2014) and a web-based partner warning strategy for CT testing in young adults through the use of a social network (Theunissen et al., 2013).

1.3 eHealth and Evaluation Models

eHealth research is typically described as a field than cannot keep up with the technological advances (Glasgow, Philips & Sanchez, in press), with regard to policies, ethics and impact assessments on users, health care systems and the management of health information (Khoja, Durrani & Nayani, 2012). Van Limburg et al. (2011) summarized it as a current lack of necessary legislations for modernizing health care, reluctant involved parties, a too great emphasis on engineering-driven solutions and a lack of cost-effectiveness studies. eHealth in general, and online health care has several benefits such as availability, convenience, accessibility, cost-effectiveness, anonymity and privacy (Gainsbury & Bladzvzynski, 2011). Postel et al. (2011a) showed that target groups could be reached which are significantly different from face-to-face treatment in an web-based treatment for alcohol abuse. More women, more participants with paid work and significantly older participants were reached in

comparison with the face-to-face treatment. Riper et a. (2010) stresses benefits such as easy search facilities and open access websites.

A lot of research is published on the evaluation of healthcare technology from different perspectives (Burke Johnson, 1998; Dansky, Thompson & Sanner, 2006; Greenhalgh & Russel, 2010; Van Gemert-Pijnen et al., 2011). Some evaluation frameworks focus on the process of designing by the developers (Burke Jongson, 1998), other evaluation frameworks are more stakeholder oriented (O'Sullivan, 2012), or propose the involvement of end-users by letting the target groups participate in the whole process of design and evaluation (Van Gemert-Pijnen et al., 2011). An example of an evaluation framework is a holistic approach for eHealth design and evaluation (Van Gemert-Pijnen et al., 2011) that is applied in evaluating antibiotic stewardship programs (Van Limburg et al., 2011) and for design and evaluation of the public health services in sexual health care (Kulyk, Roskam, David, Van Veen & Van Gemert-Pijnen, 2013; Kulyk, Akker, Op den Klaassen & Van Gemert-Pijnen, 2014). In addition, a business model, 'a how to do it', can be beneficial for the implementation process (Van Limburg et a., 2011).

Several authors have stressed the importance of careful and detailed planning (Ahern, 2006), the use of established guidelines (Karras, 2006) and the branching of technology (Pagliari, 2007). Dansky, Thompson & Sanne (2006) addressed a few methodological issues, such as the difficulty to randomize and recruited subjects, the infrastructure and resources needed to support the technology and the several regulations (such as HIPAA) which exist. Over the last decade several models for eHealth evaluation were introduced. Van Gemert-Pijnen et al. (2011) describes an overview of eHealth frameworks published in peer-reviewed journals. For example, Pagliari (2007) stressed the requirement of expertise in several fields such as medical informatics and human-centered design. Dansky, Thompson & Sanne (2006) proposed a framework in which he described four dimensions of eHealth research as interlocking pieces in a puzzle, namely the design, environment, technology and the logistics. They underline that thorough planning is necessary, but limited. When planning is integrated with the four pieces the puzzle is a suitable metaphor for eHealth research. Esser & Goossens (2009) proposed a framework for the design of user-centred teleconsulting systems which was strictly limited to patient-provided communication. They centralized the user and described the user's role at every stage of the development process (Esser & Goossens, 2009). Shaw

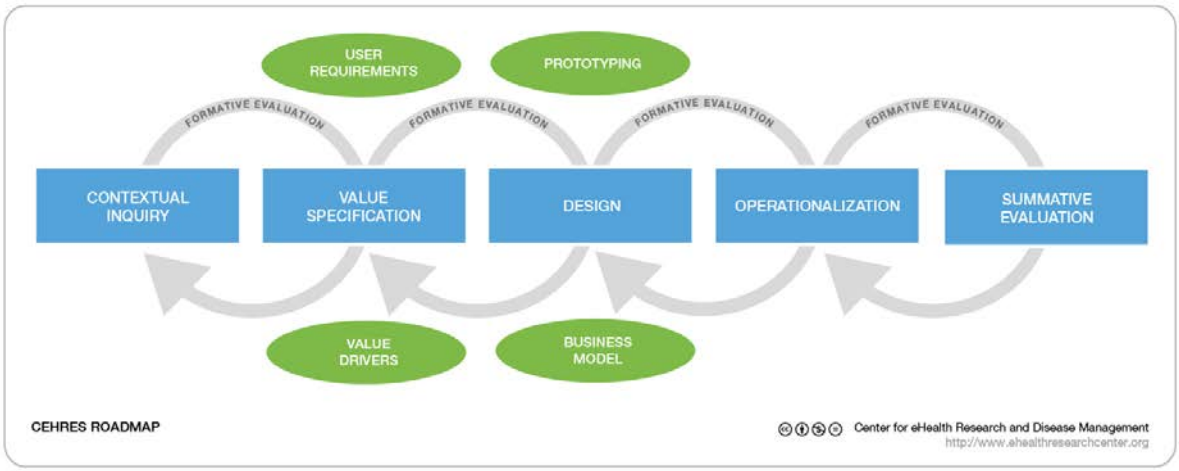

Figure 1: The CeHRes Roadmap (Van Gemert-Pijnen et al., 2011; Van Gemert-Pijnen, 2013)

(2002) proposed a formative framework to evaluate information communication technology in both quantitative and qualitative ways. He named his framework CHEATS, which described the dimension Clinical, Human and organisational, Educational, Administrative, Technical and Social. His objective was to propose a complete framework for evaluation following the view that *'In an ideal world if a system cannot be properly evaluated it should not be implemented'* (Shaw, 2002, p219). He also acknowledges that the CHEATS framework is unlikely to be completely utilized at any evaluation.

A framework integrating these evaluation theories is the CeHRes Roadmap, a framework for eHealth development and evaluation (van Gemert-Pijnen, Nijland et al., 2011). This roadmap integrates evaluation aspects, found in literature, in a holistic approach for the uptake and impact of eHealth technology. Five principles are distinguished in this framework (Van Gemert-Pijnen, 2013): eHealth development is a a) participatory development process, b) produces an infrastructure for changing health and wellbeing, c) is intertwined with implementation, d) paired with Persuasive Design Technology, e) requires ongoing evaluation cycles (formative and summative). Five iterative phases, as seen in figure 1, of forward (development) and backward (evaluation) processes are distinguished, namely the contextual inquiry, value specification, design, operationalization and evaluation. The CeHRes Roadmap aims to overcome the hurdles of evaluation design and implementation, such as a mismatch between expected benefit and actual outcomes, low end-user- and low stakeholder participation (Van Gemert-Pijnen et al., 2011). End-user participation is highly recommended (Velsen, Wentzel & Van Gemert-Pijnen, 2014). In the public sexual health case described in this article the CeHRes roadmap was utilized in formative (ongoing) development of online

Table 1: RE-AIM model (Glasgow et a., 2013).

REACH Percent and representativeness of participants.	Accessing disparate populations through targeted outreach methods and program options (i.e. transportation, hours, etc). Understanding characteristics of those who participated vs. those who declined
EFFECTIVENESS Impact on key outcomes, quality of life, unanticipated outcomes and subgroups.	Assessing broader, patient-centered outcomes, quality of life, and unanticipated consequences Understanding the impact of the context on results Considering Minimal Intervention Needed for Change Analyzing results by disparity-related subgroups—consider disparities broadly (e.g., demographics, risk, experience, residence, literacy)
ADOPTION Percent and representativeness of settings and staff that participate.	Documenting and enhancing participation of low-resource settings and a variety of staff. Understanding and addressing reasons fornon-participation by setting/staff
IMPLEMENTATION Consistency and cost of delivering program and adaptions made.	Monitoring delivery to different subgroups and by different staff Understanding and tracking costs of delivery Transparently documenting adaptations to original program
MAINTENANCE Long-term effects at individual and setting levels, modifications made.	Assessing long-term results across subgroups and identifying inequities and reason Providing infrastructure and links to community resources for individuals to sustain program results Planning for and supporting sustainability of program after initial evaluation Preparing delivery settings with tools to guide monitoring and adaption of the program long term

public sexual health interventions. Although the roadmap described both formative and summative evaluation, in practice even the summative evaluation predominantly has a formative function.

Next to generic eHealth models described above, models are available from another field of research, namely Health Promotion. An example is the widely used RE-AIM framework from Glasgow, Vogt & Boles (1999). The RE-AIM has been developed in the late ‘90s to broaden the criteria used to evaluate health promotion programs, to include elements of external validity and to evaluate issues relevant to program adoption, implementation and sustainability (Glasgow, Vogt & Boles., 1999; Caglio et al., 2013). This data is important to show the impact of an eHealth intervention (Van Gemert-Pijnen, 2013). RE-AIM is popular with policy makers and was widely used to plan, evaluate and review health promotion and disease management programs (Glasgow, Philips & Sanchez, 2013; Caglio et al., 2013). Suggested criteria are standard reporting data, informing design of interventions and providing guides for program planners and potential adopters. The RE-AIM model has five notable categories as shown in table 1. It has been applied in for example in a health promotion program for pregnant women (Van Zutphen et al., 2009), a ‘Bike to work: cyclists

Table 2: Overview of sexual health interventions

Intervention*	Name	Timefame**	Description
A	E-Consults	September 2012 – February 2014	Stepped care model in asynchronous email contact for general sexual health questions. Works together with face-to-face health care and offers blended care. This intervention primarily aims to explore online therapists competences, explore needs and expectations of caretakers with regard to the different kinds of care delivered and searches for organizational conditions.
B	Short online sex counselling	January 2013 – December 2013	Short online sex counselling for young adults between 18 and 25 years. This intervention's objective is the effectiveness of the email counselling and create an juridical, technological and content-wise effective system.
C	Onetime chat counselling	December 2012 – December 2013	Onetime synchronous anonymous chat counselling. Aim of this intervention is explore it's added value and gain insight in which conditions are necessary.
D	CT screening	December 2013 – Current	Partner warning of young adults adults at risk in a targeted secure web-based outreach strategy for (CT) testing. The service uses chain referral sampling within the sexual and social networks of young adults to deliver CT tests to young adults who are at risk.
E	CT Home tests	June 2013 – Current	Online CT testing application for high-risk young adults under 25 years. Aim is to reach out to young adults by sending self-tests to their home or invite young adults to test themselves in the clinic. Aim of the intervention is to let young adults motivate and inform each other about Sense and CT tests.. The objective is a more (cost)efficient way of delivering CT tests. The aim is to find out which path young adults prefer, e.g. CT home packages, policlinic consults or standard care.

**All interventions were used in the interviews. Interventions A, B and C were used in the scenario-based user evaluation,*
*** Note that all interventions are still running. The end date mentioned is the date where the first time frame ended.*

are rewarded' program (Dubuy, 2013) and the evaluation of social and environmental interventions aimed at promoting healthy behavior in underprivileged neighborhoods in The Netherlands (Lakerveld et al., 2013). The RE-AIM framework takes a view from organizational perspective, but lacks the use of stakeholders, especially the target group. It is very important to include several stakeholders in the evaluation process, like for example the caregivers (e.g. social workers, nurses) and the caretakers (e.g. target group) (Van Gemert-Pijnen et al., 2011). In contrary to the CeHRes it primarily focuses on summative evaluation and implementation

1.4 Case: online public health services for sexual health.

Social networks, mobile applications, serious games, informative websites and online communities are more and more used to find answers on sexual related topics (Guse et al., 2012). Public sexual health care in the Netherlands is delivered through the national health program Sense for young adults from 12 to 25 years. The online part of Sense consists of a website with extensive information about sexuality, love and relations, and anonymous contact via telephone, chat, email or skype. In addition to online services, there are anonymous face-to-face consultations at the regional 26 Municipal Health Services (MHS). Sense consultations are free public health care services in addition to primary care which

mainly provide sexual education, or diagnose the potential problem to direct clients to specific primary care services, such as policlinics for STDs or sexologists. Sense is coordinated by 8 regional Municipal Health Services (MHS) with a total of 24 cooperating MHS. Sexual health care is performed uniformly conform national quality criteria, but leaving space for customised approach for each MHS. The greater majority of caretakers are directed by the public health nurses after face-to-face consults for STDs. Most of the caretakers, have not heard of the sexual counselling before, before they were tested for a STD. Activities which are executed by the MHS are for example sexual health promotion activities such as the development of an online 'Can You Fix It' game (Lehmann, 2013) and a 'Tour of Love' bus which drives to schools and neighborhood centers, theatrical plays and an outreaching supply of information in community centers (Kulyk, Roskam, David, Van Veen & Van Gemert-Pijnen, 2013). Table 1 gives an overview of five online Sense eHealth services in pilot phase in the Netherlands. Each of them are prototypes. The currently participating interventions embody anonymous chat, -email services and an online self-testing application with home testing packages for CT. Interventions are partially subsidized by the National Institute for Public Health and Environment (RIVM) and the Ministry of Health, Welfare and Sport. The main criteria was that the intervention includes a certain form of online care with interaction between caregiver and caretaker. In addition, it needs the ability that, when successful, countrywide implementation is possible. Cost-benefit analysis lies outside of the scope of this research. All eHealth services were initiated in 2013 and are in different stages of intervention evaluation.

1.5 Target group of Sense

Within the national public health Sense program the target group is defined as young adults from 12 to 25 years old. Although the target group ages differ along the MHS the largest target group seen at face-to-face consultations is between 20 and 25 years old, followed by the young adults between 12 and 16 years old (Qrius, 2010; Wiese, 2013). Other notable characteristics of the target groups are: care seekers are often female, high educated young adults find sexual health care easier than the lower educated ones, low-educated young adults are less aware of the potential sexual health risks and find the process of seeking support more difficult (Kulyk et al. submitted). Although the population in the Netherlands is quite diverse with regard to ethnic background, ethnic minorities are currently using the public sexual health services much less than expected (Lehman, 2013; Wiese, 2013; Kulyk et al., 2013). In

a Dutch population survey, with a representative sample of the population only 8% had other than Dutch backgrounds. Young respondents and respondents with an ethnic minority background reported a relatively great need of sexual health care (Vanwesenbeek, Bakker & Gesell, 2010). Women from the Suriname and the Netherlands Antilles have, like Turkish and Moroccan men, the highest demand for sexual health care, especially with respect to relationship problems (Vanwesenbeek, Bakker & Gesell, 2010). A CT screening participation research showed that ethnic minority groups were, like low educated groups, less likely to participate in public health programs, however they were more likely to show positive on a CT test (Op de Coul et al., 2012). Wiese (2012) showed that young adults with an Islam background are thinking quite different about sexuality. It is often not discussed and topics such as homosexuality are taboo. In addition, it is difficult to reach homosexuals with public sexual health promotion (Ginsburg et al., 2002).

Although young adults can be reached more and more through various mobile applications (Meussig et al., 2013; Schnall et al, 2013), social media (Van de Belt et al., 2013; Vyas et al., 2012), chat (Giorgio, Kantor, Levine & Arons, 2013) and other modern media (Guse et al., 2012), there are still target groups, such as ethnic minorities (Op de Coul et al., 2002), homosexuals (Ginsburg et al., 2012) and low-educated young adults which are hard to reach. There is a need for more targeted specific interventions for these specific groups. This research covers the evaluation of eHealth interventions that focuses on broad target group, young adults from 12-25 with specific attention to low-educated adolescents with low social-economic status.

1.6 Objective & Research Questions

Several authors debate that online interventions should be tailored to meet the needs of young adults (Hardiker & Grant, 2011). McCarthy et al. (2012) stress that it is highly valuable to engage the target group. In order to achieve that eHealth services should be developed iteratively (Van Gemert-Pijnen et al., 2011). Formative evaluation is important to improve the online public health services. Van Gemert-Pijnen et al. (2011) stresses that stakeholders are not only the end-users, which could be young adults and health care professionals, but also other participating groups, such as intervention developers, experts and financing institutions. Therefore, this research has two objectives. The first objective is to evaluate current eHealth interventions in online public sexual health care in the Netherlands. The second objective of

this research is to develop a practical evaluation checklist specific to sexual eHealth services in public health care. In this case, the word ‘checklist’ represents a set of principles or guidelines to operationalize a specific evaluation model. This objective is formulated based on the expressed need of the RIVM for an evaluation checklist to evaluate currently running online interventions in public sexual health. All eHealth interventions take part in the national Sense program, financed by the RIVM, to improve sexual health of young adults in the age of 12 to 25. An important question is which eHealth interventions have the potential for being implemented and maintained on a national level after a pilot phase.

Both objectives support an iterative and summative evaluation from different perspectives. The scope of this research is on the one hand on the practical evaluation of the interventions with young adults and sexual health caregivers (study 1) and on the other hand on the eHealth development process involving eHealth managers and experts related to sexual health care (study 2). Any form of cost-benefit analysis and efficacy evaluation is excluded from this research.

This led to the following main research question:

Main research question: *‘What are critical points for an evaluation guideline to evaluate diverse developed eHealth services, in particular online interventions in public sexual health care?’*

The first study focusses on the end-users, young adults from 12 to 25 years old and sexual health caregivers. In this study four eHealth services in public sexual health care are evaluated to identify improvements and critical points. These critical point were used in the second study aimed at the development on an evaluation guideline to evaluate diverse developed eHealth services in public sexual health care. The eHealth services differ in their approach of development, such as for example the CeHRes roadmap (Van Gemert-Pijnen et al., 2011), Intervention Mapping (Theunissen et al., 2013) and RE-AIM (Glasgow et al., 2013). The evaluation of the current status of the eHealth services is expected to contribute in finding the critical points. This led to the following (sub)research questions.

Study 1: *'What is the current status of the existing anonymous online eHealth interventions in public sexual health care from the perspective of the end-users (caretakers) and sexual health experts (caregivers)?'*

- *What do young adults and experts think of online public sexual health interventions?*
- *To what extent do the online public sexual health interventions address the needs of the young adults and experts?*
- *Which improvements should be made to the online public sexual health interventions according to young adults and experts?*
- *What general guidelines can be generated for developing anonymous online eHealth services for public health promotion targeting young adults?*

On contrary to the end-user perspective, the second objective is more focused on the general development of online public sexual health interventions and falls within the operationalization phase of eHealth development. In order to evaluate diverse eHealth interventions during the development process, the public health care experts stressed their need for a generic evaluation checklist. Results from the first study will contribute to the development of a generic evaluation checklist.

Study 2: *'How can a generic evaluation checklist be developed for diverse online interventions in public sexual health?'*

- *Which aspects and/or evaluation models are important in an evaluation checklist for evaluation of diverse online interventions in public sexual health?*
- *What do public health experts and policy makers expect of an evaluation checklist?*
- *Which developmental aspects should be integrated in an evaluation checklist for evaluation of diverse online interventions in public sexual health?*

2. Methods

2.1 Background Methodology

In both studies one and two the CeHRes roadmap is used (Van Gemert-Pijnen, 2011; Van Gemert-Pijnen, 2013). The roadmap embodies five iterative phases, as seen in figure 1, where forward (development) and backward (evaluation) processes are distinguished, namely the contextual inquiry, value specification, design, operationalization and evaluation. Study 1 focuses on a summative evaluation of the chat and email interventions by use of mixed methods. The interventions included in study 1 are likely to continue to exist and develop, even after this study's evaluation. The following methods were used in study 1: Personas, scenarios, mystery shopping and scenario-based evaluation.

Personas are abstract representations of end-users (Pruit & Grudin, 2003). Originated in the field of marketing (Cooper, 1999) these 'user archetypes' are often used in the field of human-computer interaction to represent data collected about target users and to simplify communication with end developers (Wee Sim & Brouse, 2014).

Scenario-based design was defined by Carroll & Rosson (2002, p.1) as: '*a family of techniques in which the use of a future system is concretely described at an early point in the development process'*. Through scenario's the focus is directed at the user, from designing system operations to how, in this case, young adults, use a system to accomplish their tasks and objectives (Pommeranz, Brinkman, Wiggers, Broekens & Jonker, 2009). Carroll & Rosson describe a scenario as a *'sketch of use'* (2002, p1). Like Persona's, scenario enhance communication between stakeholders which speeds up the process of feedback and refining ideas. In contrary to the storyboards Carroll & Rosson (2002) describe, this research uses real-time scenario's. A real-time scenario is in this case an online conversation between caretakerand caregiver in the form of a chat or email.

Another method used with adjustments in study one the method of mystery shopping. In mystery shopping studies service performance was assessed at an unexpected moment by an unknown associate, who for example is dressed and acts like a customer (Ford, Latham, Lennox, 2011) Feedback is given from an (objective) third-party perspective and can be used

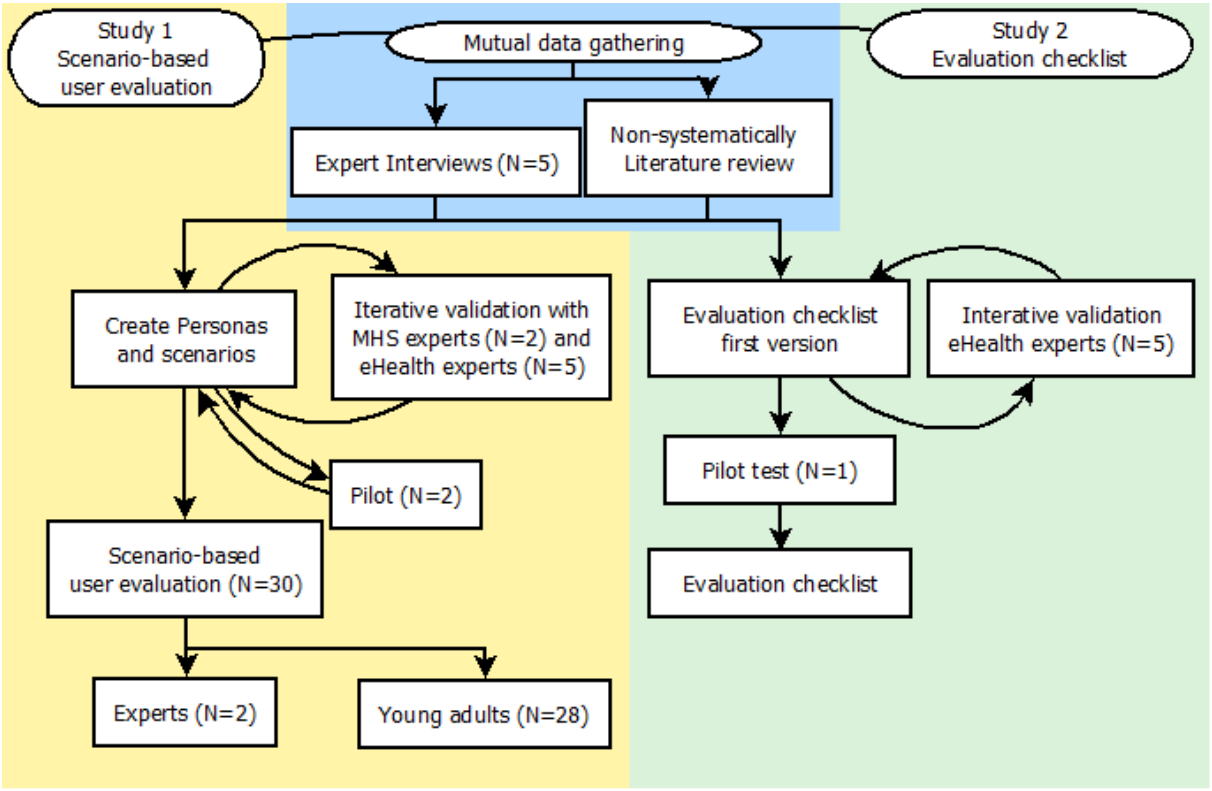

Figure 2: A model of the research procedure

by the employee or company to improve provided customer service. This method is used in various sectors, such as bank services (Tarantola, Vicard & Ntzoufras, 2012), alcohol sales to underage customers (Gosselt, Van Hoof, De Jong & Prinsen, 2007) and the use of emergency contraception by community pharmacists (Glacier, Manners, Londen & Muir, 2010). It has once been used in sexual health care to evaluate the accessibility and the public health service provided in the United Kingdom (Sykes & O'Sullivan, 2006). The mystery shopper is mostly used face-to-face. In this research a different approach was taken. In other studies (Gosselt, Van Hoof, De Jong & Prinsen, 2007) large groups of young adults were asked to act like a customer in liquor stores In this study large groups could not be used for several reasons. The use of large groups of youth would 1) be too obvious for the use of eHealth interventions and 2) would interfere too much with real care practice. The latter would have resulted in a massive amount of time spend on the research, instead of involving the actual users who have real needs. In addition, 3) the caregivers were expected to change their behaviour if they were told beforehand that young adults would sign-up at the intervention with the purpose of gathering a scenario. Therefore, two researchers went undercover instead of the target group itself. A protocol was created based on intervention specific frequently asked questions (gathered in the interviews and standard evaluation of the interventions). After gaining

permission of the Ethical Committee of the University of Twente (no. BCE14018) the two researchers gathered answers real-time based on the emails and chat scenario protocols.

Study 2 focuses more on the creation of a generic evaluation checklist for eHealth experts and policy makers to evaluate diverse and difficult to compare interventions. Figure 2 describes the research procedure in both studies.

2.2 Study 1: Scenario-based user evaluation

In this study end-users (young adults between 12 and 25 years old) have participated in a scenario-based user evaluation. Next to the CeHRes roadmap, several methods were adapted and combined from different fields, such as user-centered design (e.g. Persona, scenario-based evaluation) and the field of marketing (e.g. reporting findings by an unknown associate in real-life situations).

2.2.1 eHealth interventions

The eHealth interventions in both studies are still in the development phase, but vary in the position with regard to which particular stage they are in. For example, the online CT home-testing service mentioned in Table 2 is currently testing their prototype, where the short online counselling has already been more operationalized and ready for evaluation. The interventions were choses based on the following inclusion criteria: 1) scope: sexual health promotion; 2) online running and ready to use; 3) uses a form of online communication with caretakers aimed at answering questions (e.g., via email or chat) and 2) participated in the RIVM subsidiary fund. Interventions such as the CT home testing with online triage system which only used emails for delivering a message were thus exclude.

Four eHealth interventions were included in the first study. Two interventions about short email counselling and two about one-time chat services. In the study 1, several of the selected eHealth interventions participated in a subsidiary program from the RIVM and the Ministry of Health, Welfare & Sport. For the interviews all subsidiary interventions were included.

Table 3: Summary of the Personas

Persona 1: Annemiek	*Persona 2: Paulien*	*Persona 3: Marco*
A 15-year old girl seeks support for questions about the first time sex. Her boyfriend wants sex with her and most of friends already experienced their first time. She want to know how to cope with the first time, if she can expect pain, and how to deal with the social pressure she gets from her friends..	A 21-year old woman seeks support because she fears that her current boyfriend will force her to sex and she expects simultaneously physical abuse. Her past is compiled of physical abuse by her father, divorced parents, protecting her little brother for physical abuse, forced sex by both her first (22 years old) and her second boyfriend (32 years old). She seeks support how to cope with her current boyfriend.	An 18-year old man who is socially pressured by his friends to have sex with women. Under water he does not like women, but is developing a preference for men. He is unsure what he can tell about this. He wants to explore his feelings, but is restrained by his fear of losing his friends. He seeks support about how to cope with his homosexual feelings en the possible consequences of exploring sexually activities with a men.

2.2.2 Procedure

Two approaches were taken within the scenario-based evaluation: making Personas and use scenarios. The first approach were the interviews held primarily for study 2 with program managers, developers and eHealth experts of five interventions (see table 2). Besides the questions for study 2, interviewees were asked to describe cases that are common for their specific intervention. For example, in one of the interviews the interviewee described extreme problems as sexual harassment, abuse and lover boy problems. These cases were transformed into Personas and scenarios for possible chat and email consultations. In table 3 a short summary of all Personas is given. Table 4 presents an extensive summary and scenario of Persona 2. All three Personas and scenarios were discussed with both eHealth experts and sexual health caregivers from MHS. To ensure that Personas and developed scenarios are close to real life cases the two caregivers were asked to evaluate the Personas on the content, linguistics, approach and expected suitability of the eHealth interventions for each case. They found the Personas and scenarios to be realistic and gave feedback on primarily the linguistic adjustments to use the language that young adults use themselves in email or chat contact.
In order to further complete the scenarios, two researchers went online anonymously acting like one of the Personas with two chat and two email interventions.

Next, the completed scenarios and Personas were completely anonymized (all nicknames of the online caregivers that provided answers were removed) and included in the scenario-based evaluation protocol to be presented to the young adults as the final step of study two. This scenario-based user evaluation was structured by the use of a questionnaire which was partly based Persuasive Design Technology and partly on literature based self-composed questions. This instrument is described further on.

Table 4: The Persona of Paulien[a]

Name:	Paulien
Gender:	Girl
Age:	21
Born:	September 13th, 1992
Level of education:	Finished High school. Started Industrial Design on Unversity level last September (after she redid her last year of highschool once).
Problem:	Inflexible partner with regard to sex. He forces her to sex at moment she does not want it. Paulien has a background with physical abuse by her father and sexual harassment by her last boyfriend. Now her current boyfriend is doing the same traumatic memories are coming back.

Extensively summary: Paulien studies Industrial Design at the University of Eindhoven, the Netherlands, since September 2013. She is a person who often retracts from conversations or activities and often carries the feeling that she does not belong to the group. She is afraid that her presence is a hindrance to other people. Paulien her parents are divorced. She can still remember very clearly her parents often had quarrels and fights in her childhood. Shouting was very common. She has one brother, Frank. Until today she clearly remembers that her parents were fighting over Frank. They were very angry and father wanted to beat Frank up because he was searching father's toolbox. Paulien remembers she stood up for Frank. She told her father that she was the one who did it, which resulted in several beat-ups with an aluminum vacuum cleaner tube. This is just one example, but there are a lot more. Father abused both Paulien and Frank several times. Since her parents divorcement she hasn't seen her father anymore. She is scared to death for him and does not want to see him anymore. In addition, she does not know what to do when she encounters him

When she's 16 years old, she makes acquaintance with a 22-year old man, who got her in bed in a short amount of time. It's difficult for Paulien to say no to him. He in his turn, threatened Paulien with spreading bad stories about her. Paulien completely snapped shut and had sex with him to keep him quiet. On the age of 18 she meets with an older man. He is 32 years old. In no time the contact turned out to be mostly sex. They shared the bed several times, in which he forced Paulien to sex several times.

Her current boyfriend, Karel, whom she met five weeks ago is getting more and more inflexible with regard to sex. Paulien kept him on a distance purposively, because she is insecure about if she really wants a relationship with Karel and she does not have any clue how she wants relationship to look like. She noticed that it gets more and more difficult by the minute to keep saying no. Some kind of fear, which she knows from past relationships shows up. She is afraid that the situations, like the ones she experienced with her past boyfriends, are repeating itself. Paulien knows it is not healthy, nor normal, but she just cannot get it changed. It's almost if she draws on a certain type of man.

She comes to [online health care] because she can ask questions anonymously about what is happening. She knows that the inflexible and forcing behavior is not right and she knows saying no is very difficult for her. In general, she smiles it away, while feeling wretched inside. She always puts on make-up en tries to dress herself well, just to prevent anyone noticing the bruises she has. Paulien wants to know how she can cope best with the current situations. How does she learn to say no? Why does she attract this type of men? What is this anxious feeling she has in this kind of situations. She does not want it, it has to stop.

Expectations how the online health care copes with Paulien.

It is expected that Paulien will be referred to her general practitioner. There are not only important problems in her current situation (such as a difficulty to say no), but also in her past (abuse). Paulien is heavily traumatized by being abused physically by her father and sexually by her past boyfriends. These situations had a severe impact on Paulien's psychological development. Next to the reference to the general practitioner, an advice should preferably be given for specialized mental health treatment. The caregiver should probe questions for Pauliens problems

[a]*Photograph used with written permission. Although based on real stories, this Persona was made up for this research.*

The user evaluation sessions with the paired young adults lasted from 45 to 60 minutes each. Some email conversations in the real scenario where longer than chat conversations for example. Two experimenters, male and female carried out the scenario-based evaluation sessions using the same protocol. Sessions with female participants were guided by a female experimenter due to the sensitivity of the subject. The session was divided into four parts. In the first part, an experimenter introduced the topic and purpose of the study. Participants were informed about the purpose of the study via a letter before as well as verbally during the session. Young adults received information about the sessions objective and an general introduction to online health care. The information about the purpose of the study was repeated in the first part. Young adults were again informed that they were voluntarily joining this research and were allowed to quit any time without having to mention a reason. It was made sure that informed consent was signed. Participants were also asked permission to collect audio recording data from the session for research purposes only with the guarantee their names or nicknames will remain anonymous. First, young adults were asked to fill in several questions about demographic data. In the second part the researcher showed the Persona to the young adults. The researchers summaries the Persona and read the content of the scenario out loud. In case of Persona 2 extra time was spent on this moment because of the Persona's content (sexual harassment, history of abuse). It was expected that the content of a scenario is likely to be 'heavy' for the young adults. Several questions were asked about the Persona. In the third part, the gathered scenario was shown to the young adults. Every step the experimentes had taken earlier on was shown and explained to the young adults through an overview of the screen shots. The screen shots showed the chat or email conversation within an intervention screen. Young adults were again asked to fill in several questions, this time about the system aspects. In the fourth part the session was evaluated. The whole session was recorded by audio. Several related topics were discussed in session, such as which impression the Persona left on the young adult. Afterwards young adults were rewarded with a coupon worth 12.50 euros as a compensation for participating.

2.2.3 Instrument

This research uses three questionnaires during the scenario-based user evaluation sessions that can be found in Appendix I. The first questionnaire focussed primarily on the caretaker and embodies demographic variables such as age, gender, education level and 'ever had sex'

Table 5: Overview of instrument in scenario-based user evaluation with example questions[a]

Part	Constructs	Sources	Questions (English)
Caretaker			
1	Demographic information	Adapted based on Op de Coul et al. (2012) and on Kulyk et al. (2013)	Gender, age, ever had sex (yes or no), education, country of origin, difficulty to talk about sex, experience and use of current public sexual health care, use of social media.
1	Openness	Adapted from Del Re, Flückiger, Horvath, Symonds & Wampold (2012)	For questions about sexuality I can talk to family and friends I think it's difficult to talk about sex.
The System			
2	Expectations & Sympathizing with a Persona	Adapted from Andersson et al. (2012)	How do you expect the conversation will come along? Part 3: You described your expectations about this conversation earlier on. How do you look back at these expectations?
2	Persona Validity & Openness	Adapted from Del Re, Flückiger, Horvath, Symonds & Wampold (2012) and Pruit & Grudin (2003).	Do you think this Persona is suitable for online support? What would support the person in the Persona the most?
3	Perceived system credibility	Adapted based on Oinas-Kukkonen and Harjumaa (2009) & Busch, Schrammel Tscheligi (2013)	I find the application to be credible. I find the application to be reliable.
3	Design aesthetics	Adapted based on Oinas-Kukkonen and Harjumaa (2009)	The general appearance of the application is appealing, The screen of the application (i.e. colours, layout, presenters, etc.) is attractive.
3	Unobstrusiveness	Adapted based on Oinas-Kukkonen and Harjumaa (2009)	Seeking information about sexuality fits in my daily activities Using chat/email tool would disturb my daily activities.
3	Usability	Adapted from the Website Evaluation Questionairre (WEQ, Hornbaek (2006)	The received information is appropriate. The information gained influences my way of seeking sexual health support. It's clear to me where I can find information about sexuality.
Caregiver			
3	Communication	Adapted based on Creed & Kendall (2005), Lang & Van der Molen (2013), Miller & Rollnick (2013), Roskam (2013), Oinas-Kukkonen and Harjumaa (2009) & Busch, Schrammel Tscheligi (2013)	Responses given by the caregiver are appropriate. The information given by the caregiver answers my question. I think this is a pleasant conversation. I feel understood by the caregiver.
3	Perceived caregiver credibility	Adapted based on Oinas-Kukkonen and Harjumaa (2009) & Busch, Schrammel Tscheligi (2013)	I think the caregiver shows expertise.

[a]*This table only contains a few examples. Find the complete instrument in Appendix I*

(questions 1 to 11, Appendix I). The second questionnaire explored expectations from the young adults (questions 12 to 16, Appendix I). The second part was based on related research in public sexual health care (Op de Coul et al., 2012; Kulyk et al., 2013). The third part (question 17 to 44, Appendix I) embodied several questions adapted from perceived persuasiveness (Oinas-Kukkonen & Harjumaa, 2009; Lehto, Oinas-Kukkonen & Drozd,

2012) and usability (Horbaek, 2006) which focus on the system and aspects of communication which focus on the caregiver (Creed & Kendall, 2005; Lang & Van der Molen, 2013; Miller & Rollnick, 2013). Constructs were assessed by their relevance by the researchers and adapted to the eHealth services in public sexual health care through thorough discussion. Although it was named a questionnaire young adults were asked in most of the times to rate a statement on a 5-point Likert scale (strongly agree, agree, neither, disagree, strongly agree). Some of the questions, for example about openness and Persona validity were open questions.

Persuasive technology was introduced by Fogg (2003) as *'interactive information technology designed for changing users' attitudes or behaviour'* (Oinas-Kukkonen & Harjumaa, 2009, p486). With several technological advances such as the internet, mobile telephones and other ambient technologies lots of opportunities were created for persuasive interaction. Oinas-Kukkonen & Harjumaa (2008, p203) describe persuasive systems as '*computerized software or information systems designed to reinforce, change or shape attitudes or behaviours or both without using coercion or deception*'. Table 5 shows an overview of the four categories from persuasive system design (PSD), showing a few examples. The complete questionnaire used can be found in Appendix I. The three categories are: 1) perceived system credibility, an attribute of the object of interest (to be credible) (Lehto, Oinas-Kukkonen, Pätiälä & Saarelma, 2012), 2) design aesthetics, users satisfaction is firmly predicted by the visual aesthetics of a computer interface (Lehto, Oinas-Kukkonen & Drozd, 2012) and 3) Unobtrusiveness, the way wherein users can integrate the system in their daily life (Oinas-Kukkonen & Harjumaa, 2009). The usability category was added based on the Website Evaluation Questionairre (WEQ) from Horbaek (2006) to explore the information given by the caregiver. The perceived caregiver credibility was inspired by Oinas-Kukkonen & Harjumaa, (2009), but focusses on the caregiver instead of the system. The communication category was added to assess the quality of the caregiver and was based on the therapeutic alliance described by Creed & Kendall (2005) and therapeutic skills (Lang & Van der Molen, 2013; Miller & Rollnick, 2013).

For the expert evaluation the questions were reformulated if necessary. For instance, while a young adult was questioned about how credible he/she thinks the caregiver is, the sexual health experts were asked how credible young adults would think the caregiver is. Two pilots

were held with expert researchers during the study in order to improve this questionnaire. Slight changes were made to the questions and the study procedure according to the feedback received after the first and the second pilot. For example, text was improved and the layout was changed. Some questions were partly on two pages and were changed to one page to guarantee participants read the see all the possible answers.

2.2.4 Study Sample

In total, 28 young adults between 12 and 25 years old, from which 12 boys (42.9%) and 16 girls (57.1%) from region Twente, province Overijssel, The Netherlands participated in the scenario-based user evaluation, as shown in Table 8. In addition, data such as including gender, age, level of education and country of birth were gathered. Young adults were recruited via a social worker of the government-funded Alifa Foundation based on the following inclusion criteria: 1) age between 12 and 25 years; 2) young adults agreed on participating after signing informed consent; 3) in case the young adults were younger than 16 years, a parent or guardian also signs informed consent; 4) participant is able to read and speak fluently in Dutch language.

Informed consent was achieved by handing out information flyers and informing participants at test commencement. Participants granted permission for data use by signing an official informed consent paper. In case a participant was 15 years of age or younger (12-15), additional consent form was collected signed by the respective parent or guardian\.

Use cases for scenario-based evaluation were given to participants in random order. Randomization was arranged independent of the experimenters in order of availability in time. Table 6 shows how the participants were randomized to the sessions. After signing informed consent they were randomized at either male or female groups, depending on their gender. This grouping was used to prevent mixed groups. It was expected that a mixed group would highly influence the young adults behavior. Young adults were invited between 20th of March and the 5th of April 2014. Boys did not differ significantly from girls on all demographic variables. In the end, 28.6% participants

Table 6: Overview of participant randomization*

Session	eHealth service	Persona	Participants	
A	Chat 1	1	1,2	17,18
B	Chat 2	1	3,4	19,20
C	Email 1	2	5,6	21,22
D	Email 2	2	7,8	23,24
E	Chat 1	2	9,10	25,26
F	Chat 2	2	11,12	27,28
G	Email 1	3	13,14	29,30**
H	Email 2	3	15,16	31,32**

*Note that this is the order in which the groups were filled in respect to gender
**16 pairs were planned. The time frame was postponed several times. In the end, 14 pairs came.

(N=8) saw Persona 1, the light case of Annemiek, 57.1% (N=16) saw the heavy case second Persona of Paulien with sexual abuse and 14.3% of the participants (N=4) saw the case of the third Persona Marco, who conflicts between his homosexual feelings and group pressure from his friends.

Two female sexual health caregivers (age 27 and 41) from the MHS service participated in the scenario-based testing. Experience with sexual health varies from 2 to 4 years. Experience with sexual health was primarily described as email and face-to-face contacts.

2.2.5 Data-analysis

SPSS21.0 (©International Business Machines Corp.) was used for statistical analysis. A significance level of 0.05 was used. Descriptive statistics were to describe the characteristics of the study population. Normal distributed continuous (interval and/or ratio) variables are described as means and standard deviations (SD), categorical (nominal and/or ordinal) variables were described as numbers and percentages (%). The latter covers most variables. Differences in demographic data are tested with a Chi-Square test. An independent groups T-test was used to compare two groups (i.e. chat with email) and a one-way Anova was used to compare more than two groups (i.e. the four interventions). Missing values, which are missing completely at random, because of a participant who did not noticed that the questionnaires were printed on both sides (MCAR, Wang & Chen, 2009), are imputed by entering means. Before analyzing the qualitative data was grouped per question according to the participation number. In the analysis data was grouped in small portions of equivalent information by hand.

The data from study 1 will both contribute to the development of an evaluation checklist as described in study 2 and will provide valuable points for improvements on its own.

2.3 Study 2: the development of an evaluation checklist

The main aim of study 2 was to develop a generic evaluation checklist for practical use by experts and policymakers to formatively evaluate diverse online eHealth interventions. The specific case of study 2 is public sexual health promotion and counselling. This checklist could be used at every phase of the eHealth design process according to the CeHRes roadmap. The checklist was initially based on two models: on one hand the CeHRes roadmap (Van Gemert-Pijnen, 2011), and on the other hand the RE-AIM framework (Glasgow, Vogt &

Table 7: Overview of questionnaire in scenario-based testing with example questions*

Category	*Source*
Objective	Based on Eysenbach (2000) and Van Gemert-Pijnen et al. (2011),
Added Value	Lakerveld et al. (2013), Yusof, Papazafeiropoulou, Raul & Stergioulas (2008).
Feasability of implementation	Yusof, Papazafeiropoulou, Raul & Stergioulas (2008), Van Gemert-Pijnen et al (2011), Glasgow, Vogt & Boles (1999), Dansky, Sanner & Thompson (2006)
Measurement of effects	Based on interviews
Target Group	Based on Van Gemert-Pijnen et al. (2011), Pagliari (2007), Lakerveld et al. (2013), Yusof, Papazafeiropoulou, Raul & Stergioulas (2008), Glasgow, Vogt & Boles (1999) and the interviews
Caregivers perspective	Based on Van Gemert-Pijnen et al. (2011), Lakerveld et al. (2013), Pagliari (2007), Yusof, Papazafeiropoulou, Raul & Stergioulas (2008), Greenhalgh & Russel (2010) and the interviews
Quality of care	Based on Van Gemert-Pijnen et al. (2011), Pagliari (2007), Lakerveld et al. (2013), Yusof, Papazafeiropoulou, Raul & Stergioulas (2008) and the interviews

**This table only contains a few examples. Find the complete instrument in Appendix III*

Boles, 1999). Were the CeHRes roadmap underlines the importance of the iterative character of evaluation, both formative and summative, the RE-AIM framework intension is more summative. In this research the interview questions were based on the RE-AIM model, rather than a ready evaluation tool as it was intended by Glasgow et al. (1999). In addition, guidelines specifically defined within Sense eHealth project to evaluate pilot project proposals were advised. Namely: cost-effectiveness analysis and evaluation of the project outcomes (before and after evaluation measurements), quality aspects of online counselling (protocols for eHealth counselling training of public healthcare professionals), legal considerations, the client record, sustainability and flexibility.

2.3.1 A non-systematically literature review

Literature which underlines various evaluation frameworks was studies to creat the evaluation checklist. Non-systematically literature review was applied. Related work was found via the following databases: ‘Sciencedirect’ (all Elsevier Journals), ‘Google Scholar’ and within the ‘Journal of Medical Internet Research (JMIR)’. Examples of search terms were ‘eHealth; online treatment evaluation; framework; mHealth; mobile health, electronic health; internet, social media, health promotion, sexual health care, scenario-based testing’. Various combinations of search terms were applied to find more information. Relevant reviews were analysed and meta-analysis was taken into consideration. Based on the analysis, a list of relevant criteria was formulated based on the work of Lakerveld et al. (2013), who based their criteria on Grol & Wensing (2006), Lakerveld et al. (2006) and Fleuren et al. (2004), Van

Gemert-Pijnen et al. (2011) and the evaluation frameworks of Yusof, Papazafeiropoulou, Raul & Stergioulas (2008) and Eysenbach (2000) were added.

2.3.2 Interviews

Semi-structured interviews (N=5) with eHealth service developers and public health managers were conducted in order to find out which criteria were thought to be important om practice and whether the suggested evaluation criteria described above are actually relevant in practice. Content analysis was used for data-analysis in which the researcher took an initially black perspective and marks and categorizes what he encounters (Hsieh & Shannon, 2005). Not that the researcher searched with the thought of creating a generic checklist to evaluate diverse eHealth services in his mind. This led to the categories described in table 7. Interview participants were volunteers recruited through the RIVM. All eHealth services within the national Sense eHealth project (see table 2) were included. The RE-AIM framework was used as a guideline for the interview questions. Interview time varied between 50 to 80 minutes. The sessions were audio recorded with the participant's permission.

2.3.3 Expert evaluation

The first draft of the evaluation checklist was presented to three public health experts of the RIVM institute. This group embodied a Postdoctoral researcher with a background in psychology, a public policies advisor with more than twenty years of experience and an expert in epidemiology with a focus on STDs. In addition, the same evaluation checklist was presented to one eHealth research expert and to the Sense eHealth expert panel consisting of representatives from every participating eHealth service, public policy makers, healthcare providers from the regional municipal health services as well as researchers from international research institutes, national thematic institutes and RIVM. The experts who participated in the validation were asked to use the evaluation checklist while evaluating the end reports from the completed pilot phase of the related eHealth services. The results from the expert validation were used to adjust and optimized the evaluation checklist. The main improvements included a reduction from a five point Likert scale to a three point scale ('**+**' : the criteria is sufficiently attended; '**-**': criteria is not- or insufficiently attended; '**0**': the criteria is not relevant or cannot be evaluated) and adding introductions to a few items.

3. Results

Table 8: Demographic variables

	Chat (n=16)		*Email (n=12)*		*Total (n=28)*		*Analysis*		
Gender							X^2	*df*	*Sig*[a]
- Boy	10	83.3	2	16.7	*12*	42.9	5.9	1	***.02***
- Girl	6	37.5	10	62.5	16	57.1			
Age									
- 12-14	6	75.0	2	25.0	8	28.6	2.1	3	.59
- 15-17	5	55.6	4	44.4	9	32.1			
- 18-20	2	33.3	4	66.7	6	21.4			
- 21-24	3	60.0	2	40.0	5	17.9			
Ever had sex									
- Yes	4	40.0	6	60.0	10	35.7	1.9	3	.17
- No	12	66.6	6	33.3	18	64.3			
Level of Education[b]									
- MBO/Practical Education	5	50.0	5	50.0	10	35.7	4.7	5	.46
- VMBO	9	64.3	5	35.7	14	50.0			
- Higher education	2	50.0	2	50.0	4	14.2			
Country of Birth									
- Native	15	57.7	11	42.3	26	92.9	2.1	2	.35
- Non- native	1	50.0	1	50.0	2	7.1			
Country of Birth Father									
- Netherlands	7	53.9	6	46.1	13	46.4	6.5	5	.26
- Turkey	5	83.3	1	16.7	6	21.4			
- Surinam	3	60.0	2	40.0	5	17.9			
- Other non-native	1	25.0	3	75.0	4	14.3			
Country of Birth Mother									
- Netherlands	9	60.0	6	40.0	15	53.6	7.0	5	.22
- Turkey	4	80.0	1	20.0	5	17.9			
- Surinam	3	75.0	1	25.0	4	14.3			
- Other Non-native	0	0.0	4	100.0	4	14.3			
Ever used online sexual health care									
- Yes	0	0.0	0	0.0	0	0.0	2.9	1	.09
- No	16	61.6	10	38.4	26	92.9			
- Never, but other form of health care	0	0.0	2	100.0	2	7.1			

[a] *a significance of p>0.05 was used,* [b] *based on Dutch education system*

3.1 Study 1: Scenario-based user evaluation

In this research three Personas were distinguished (see table 3), Persona 1: a 15 year old girl who seeks answers on her questions about first time sex, Persona 2:a 21-year old woman who seeks support because she fears that her current boyfriend will force her to have sex and she expects simultaneously physical abuse and Persona 3: an 18 year old man who is socially pressured by his friends to have sex with women, but instead has a preference for men (Persona 3). In total four services participated, of which two wee chat services and two were email services

3.1.1 Caretaker

This category describes the demographic information of the caretaker and the degree of openness during the sessions. Table 8 presents characteristics of the 28 participants in the

Table 9: Openness

For questions about my body, love, first time and my sexuality I can easily	*Chat (n=16)*		*Email (n=12)*		*Total (n=28)*		*Analysis*		
	n	%	n	%	n	%	X^2	*df*	*Sig*[a]
- Yes, with friends, not in my family	6	37.5	2	16.7	8	28,6	3.8	3	.29
- Yes, with family, not with my friends	1	6.2	1	8.3	2	7,1			
- Yes, with friends and family	7	43.8	9	75.0	16	57,1			
- No, neither one	2	12.5	0	0,0	2	7,1			
Difficulty to talk about sex[a]									
- Neutral	10	62.5	7	58.3	17	60.7	2.5	2	.29
- Disagree	2	12.5	4	33.3	6	24.4			
- Very much disagree	4	25.0	1	8.4	5	17.9			
Difficulty to talk about sex[a]									
- Agree	2	12.5	0	0,0	2	7,1			
- Neutral	5	31.2	6	75.0	11	39.3	2.4	3	.50
- Disagree	7	43.8	4	33.3	11	39.3			
- Very much disagree	2	12.5	2	16.7	2	7,1			

[a]*This question was asked twice to research if the caretakers were getting more comfortable during the sessions.*

scenario-based user evaluation. Of these, 57.1% were girls, 64.4% never had sex, 50% is educated with the Dutch VMBO (which equals preparatory secondary vocational education), 92.9% is born in the Netherlands, 46.4% has a Dutch mother and 53.6% a Dutch father. Most were second-generation foreigners (53.6%). None of the participants had ever used online sexual health care, where 7.1% had used an other form of mental health care. Significant differences were found in respect to gender. 83.3% (N=10 from total N=12) of the boys who participated in the scenario-based user evaluations were chat was used, while 62.5% (N=10 of total N=16) of the girls who participated in the scenario-based tests used email (X^2=5.9, p=0.02). There were no other significant differences found in any of the variables presented in table 8.

With regard to openness table 9 shows that 57.1% of the participants could talk about sexuality with both friends and family, 28.1% is limited to their friends and only 7.1% could neither talk with friends nor family. The difficulty in talking about sex was indifferent in both chat and email at both baseline ((X^2=2.5, p=0.29) and in the third part of the session (X^2=2.4, p=0.50). No other differences were found.

3.1.2 The system

To measure the system properties questions were asked about expectations, the Persona validity and several factors of perceived persuasiveness (see Table AII-1). Young adults and sexual health caregivers were asked if they thought the Personas were suited for online support and how open the Persona would be.

Table 10: Type of communication suitable per Persona according to the participants(=N)[a]

	Persona						Total	
	1 - Annemiek		2 - Paulien		3 - Marco			
Communication type	n[b]	%	n[b]	%	n[b]	%	n	%
Email	2	16.7%	5	17,9%	0	0,00%	7	15.9
Chat	2	16.7%	7	25,0%	1	25,00%	10	22.7
Skype	1	8.3%	0	0,0%	0	0,00%	1	2.3
Telephone	2	16.7%	3	10,7%	0	0,00%	5	11.4
Professional face-to-face dialogue	3	25.0%	11	39.3%	2	50,00%	16	36.4
Friends/family	2	16.7%	2	7,1%	1	25,00%	5	11.4
Total	12	100,0%	28	100,0%	4	100,0%	44	100,0%

[a]participants were allowed to fill in more than one answer
[b]the N is the amount of times all the participants filled in a specific form of communication. They were allowed to fill in more than one option.

'Do you think this Persona is suitable for online support?'

Participants were asked to give their opinion on if they thought the Personas were suitable for online public sexual health. Most participants (82.1%, N=23) found the Persona to be suitable for online support. Reactions differed between '*On this way she can be supported*' (Girl about Persona 1, 15-17), '*She needs support'* (Boy about Persona 2, 15-17) and '*It is something you can ask Questions about*' (Girl about Persona 1, 18-20). Participants 3 (10.7%) and 2 (7.1%) didn't find respectively Persona 3 and 2 suitable. Reasons varied. One participant noted that Persona 3 is not asking for support *'No, he is not asking for support, it is a story'* (Girl about Persona 3, 21-24), another thought of the online support to be impersonal '*This guy knows exactly what's wrong, but only needs to gain confidence to open up. The online support is too impersonal for that*' (Girl about Persona 3, 18-20).

Both experts agreed on the suitability of the Personas. '*When it comes to chat, for example, then there's plenty room for a good interactive conversation'* (Expert B on Persona 2, 27). *'There is a lot of factual information available. The transference of knowledge put her at ease by, handing out information'* (Expert A on Persona 1, 41)

'Which form of contact do you think is most suitable for this Persona?'

Table 10 presents the type of (online) communication participants found to be most suitable according to the Persona presented in the evaluation. In Persona 1's situation participants were unambiguous and divided their votes over all the options available. In the third Persona's situation 50% would have taken a face-to-face dialogue, for example an MHS. In the situation of Persona 2 39.29% (N=11) would have taken face-to-face support, followed by

25.0% (N=7) for chat. Both experts chose for chat and a professional face-to-face dialogue. In addition, one of the experts added skype as a possibility.

'According to you, what would support the person in this Persona the most?'

In Persona 1, young adults were ambiguous in their opinions: '*A referral to the general practitioner*' (Girl about Persona 1, 15-17), '*if that one gets information about her problem'* (Boy about Persona 1, 14-17), '*Confidence*' (Boy about Persona 1, 12-14) and '*an explanation about how it feels, how sex can be less painful*' (Boy about Persona 1, 15-17). In the second Persona opinions did not differ: *'She needs friends to support her'* (Girl about Persona 2, 15-17), '*the guts to say no to her partner'* (Boy about Persona 2, 15-17), *'professional support'* (Girl about Persona 2, 18-20), '*get rid of her trauma and learn to say no'* (Girl about Persona 2, 15-17). A general response from all the participants was the worries of Persona 2s situation. Some even stressed that it was the one thing which stuck in their memories most after the user evaluation was completed. Even in the third Persona responses varied: '*information about how he can come out about his sexual preferences and he can do these things*' (Girl about Persona 3, 18-20), '*ask friends and family'* (Girl about Persona 3, 21-24) and '*a caregiver'* (Boy about Persona 3, 12-14).

One of the experts stressed that the Persona 2 would need dialogue the most. *'I think that this person needs dialogue the most to clarify her problems, followed by a reference to a psychologist for example (if you look at the impact of the child psychotrauma)'* (Expert B on Persona 2). The other expert added *'information, put at ease, explore needs at boarders'* (Expert A on Persona 1).

With regard to expectations this research both explored and reflected on what young adults and sexual health experts expect from the online dialogue via either a chat or a mail service. This part is also intended as a form of feedback on the dialogue itself.

'Imagine you are the person from one of the Persona and online health care does not exist. What would you have done?'

As shown in table 11participants mentioned 37 options in several combinations. The majority (N=15, 55.6%) of the participants would have turned to family, either as a first or secondary action. '*To my parents to talk about it for advice, eventually the conversation needs to come'*

Table 11: The type of health care young adults (N=27) would have sought when if online support did not exist.

'Imagine you are the person from the Persona and online health care does not exist. What would you have done?'	All eHealth services *(n=37)*[a]	
	N	%
Professional	6	16.2
Family	15	40.5
Friends	10	27.0
Internet	3	8.1
Cops	2	5.4
Would not have done anything	1	2.7

[a]*the N is the amount of times all the participants filled in a specific form of communication. They were allowed to fill in more than one options.*

(Boy about Persona 1, 18-20) and '*I would have talked to family*' (21). The second largest groups (N=10, 28.6%,) would have spoken to friends. '*Approach good friends first and consult them, after that I'll know where to go'* (Boy about Persona 2, 21-24) and *'To friends and ask them if they can advise me and if needs be, call the cops'* (Boy about Persona 2, 15-17). Another group (N=6, 22.2%) would have sought a professional '*If this would occur to me I would use an online chat, but preferably a face-to-face dialogue'* (Girl about Persona 2, 18-20). A few (N=3, 11.1%) would have searched on the internet or would have joined a forum. *'Seek things out on forums where people are debating these topics'* (Girl about Persona 3, 18-20). Two people would have (7.4%) reported it to the cops. '*Quit the relationship, break all contacts that involve him. If he goes on, call the cops for stalking'* (Girl about Persona 2, 15-17). Both were reactions on Persona 2 with physical and sexual abuse. One person (3.2%) would not have done anything *'I would not say anything, because I am afraid it would get* worse' (Girl about Persona 2, 18-20).

One of the experts would have focused on searching for more information: '*probably seeking information online, reading books with information'* (Expert A about Persona 1, 41). The other expert took a different approach, which has common ground with the young adults: *'Since the contact with her parents does not seem to be so good, I would have turned to friends which I can trust. Taking into account she does not know that there is such a thing as MHS'* (Expert B about Persona 2, 27)

'What are your expectations from the conversation?'

Participants were asked how they expected the conversation went. It was asked before showing the complete chat or email conversations. All participants' answers showed that it

Table 12: Young adults (N=26) reflection on their earlier expectations

'You described your expectations about this conversation earlier on. How do you look back at these expectations?'	eHealth services *(n=26)*[a]	
	N	%
The conversation corresponds to my expectations	2	7.7
The conversation fairly corresponds to my expectations	17	65.4
The conversation hardly corresponds to my expectations	4	15.4
The conversation was completely different in relation to my expectations	3	11.5

[a]*the N are the participating young adults. Two young adults were excluded due to imputed variables, which fell between the categories*

would depend on the attitude. Participants expected either Persona 1, 2 or 3 to be very open '*She will tell everything, because you are there to talk about your problem'* (Girl about Persona 2, 15-17), or more reserved *'In the beginning the conversation will be very trivial, later when a trusted alliance is created she will tell more'* (Boy about Persona 2, 15-17). Participants were expecting a gradual buildup of trust between the caretaker and caregiver, which the young adults expected to lead to more openness from Persona 1, 2 and 3. Expert B (on Persona 2, 27) expected that *'I suspect that she would talk about her current situation, boyfriend wants sex more immediate than her. I think that it is less likely that she will talk about her past experiences, for example her first sexual experience.'*. In addition, Expert B expected that, while the dialogue continued and the caregiver asked more questions, the total view of the Persona will broaden. Expert A (on Persona 1, 41) expected that the conversation would be more about *'what she knows, why she has questions, what her role is in her group of friends, the experiences from friends, problems, insecurities'*.

After the Personas were presented, participants were asked to look back on their expectations. Table 12 shows that 7.7% of the participants found the conversation corresponded to their expectations. Examples are '*I think the conversation went really well*' (Girl about Persona 1, 15-17) and '*She was supported'* (Girl about Persona 2, 12-14). 65.4% of the participants thought that the conversation corresponded fairly close to their expectations. '*She got solid answers on het questions'* (Boy about Persona 1, 15-17), *'It is fairly comparable'* (Boy about Persona 2, 15-17) and '*She asked for support, and that's what I expected'* (Girl about Persona 2, 12-14). 15.4% found the conversation didn't really correspond to their expectations. Examples are *'It was different than I expected'* (Girl about Persona 2, 15-17) and *'I thought that she would not mention her age, because sex takes place between two people who are really attracted to sexual contact'* (Boy about Persona 1, 18-20). 11.5% stressed that the conversation was completely different to their expectations. *'The caregiver was outright*

horrible and presented everything in with the wrong tone' (Boy about Persona 1, 18-20) and *'He was supported, but he is clearly not convinced'* (Gil about Persona 3, 21-24).

'Was this how you would have conversated at the online support?'
Most of the participants (67.9%, (N=19) would have taken the same approach as in the conversation. '*I would have asked those questions the same way'* (Girl about Persona 1, 15-17) one said. Other reactions were *'I would have tried to put him at ease, but what he* [caregiver] *does is not wrong'* (Girl about Persona 3, 15-17). Some participants would have been cautious in telling their story *'I would not tell my story immediately, because I'm not confident yet'* (Boy about Persona 2, 15-17) and *'I would have been more cautious'* (Girl about Persona 3, 18-20). 32.1% (N=9) would have taken a different approach *'I would have immediately asked for sexual health care'* (Girl about Persona 2, 15-17) and *'I would have asked if there is a possibility for a phone call or if I could have a conversation somewhere'* (Boy about Persona 2, 15-17). The latter are both face-to-face conversations. For a few there was another step to take prior to online health care *'I would have gone to my parents or friends first, after that I would try that chat'* (Boy about Persona 1, 15-17).

The experts focused more on the role of the caregiver in the conversation. Both experts saw two scenarios each. In 3 of the 4 scenarios the experts disagreed with the way the dialogue occured. Expert A would have gone '*deeper into the topic where she still had questions. As it is now, it's very general. This information can also be read, seems not to add any extra value'* (Expert A on Persona 1, first scenario, 41) and '*I would not have started with that sex under 16 is punishable'* (Expert A on Persona 1, second scenario, 41). '*I would have asked more questions in the first mail to clarify the situation. In the second mail, a good advice could be given, because the Persona talked about her own problems. Most of the time young adults are not so eager to talk about their problems without directed questions. That means you're missing the "real essence of the problem" and so you cannot deliver sufficient advice'* (Expert B on Persona 2, first scenario, 41). Expert B was more enthusiastic about the second scenario: '*the clarifying questions are comparable. Though, as they are formulated here, they could be daunting (those questions are pretty complex)'* (Expert B on Persona 2, second scenario, 41).

'Imagine you are dealing with questions on sexuality. Would you use a form or online support?'

Young adults were asked if they would use any form of online support in the future. Answers varied from '*if it's reliable. Plus, people who are specialized in this are supporting you*' (Girl about Persona 1, 15-17) to '*I would not use it swiftly'* (Girl about Persona 2, 15-17) and '*I can take care of myself*' (Girl about Persona 2, 15-17). Participants who would like to use online support primarily mentioned chat '*Then I would have gone for a chat*' (Girl about Persona 2, 18-20) and '*I would consider chat because it is reliable and I would stay anonymous'* (Girl about Persona 2, 18-20). Some stressed the importance of the caregivers' expertise '*they* [caregivers] *are experienced'* (Boy about Persona 2, 15-17). The urge for information '*if you google you get a lot of information, I would like to have more specific information*' (Girl about Persona 3, 18-20). The role of their friends '*I would solve this with my friends*' (Boy about Persona 1, 12-14). Both experts were enthusiastic and thought online support through the chat or email service could be very helpful. Both would like to use it more in their daily work as a sexual health caregiver.

3.1.4 The system & the caregiver

An overview of the questionnaire used to measure the aspects of the system (usability, unobtrusiveness, perceived system credibility and design aesthetics) and the caregiver

Table 13: Differences between chat vs. email, and young adults vs. experts in regard to the system

	Chat *(N=16)*		Email *(N=12)*		Analysis[a]	
Factoren	Mean	SD	Mean	SD	95% CI	P
Perceived system credibility	2.25	.73	2.05	.93	.19 (-.45 to .84)	.54
Design Aesthetics	3.01	.91	2.42	.85	-.05 (-.05 to -1.34)	.07
Unobtrusiveness	3.16	1.03	3.32	.92	-.10 (-.94 to -.60)	.66
Usability	2.50	.61	2.52	.63	-.01 (-.52 to .46)	.91
Communication	2.37	.66	2.35	.75	.19 (-.54 to .56)	.96
Perceived caregiver credibility	2.50	1.03	2.11	.80	.39 (-.39 to.1.13)	.29
	Young adults *(N=28)*		Sexual health caregivers *(N=4)*[c]		Analysis[a]	
Factoren[b]	Mean	SD	Mean	SD	95% CI	P
Perceived system credibility	2.17	.81	2.00	.00	.17 (-.67 to1.01)	.67
Design Aesthetics	2.79	.93	3.25	.29	-.98 (-1.43 to -0.50)	.33
Unobtrusiveness	3.23	.97	2.75	.50	.96 (-.54 to 1.50)	.35
Communication	2.36	.69	2.63	.50	-.27 (-1.00 to .47)	.47
Perceived caregiver credibility	2.33	.94	2.25	.50	.08 (-.91 to 1.07)	.87

[a] *Independent t-test*
[b] *Note that usability was not compared between young adults and experts due to a difference between constructs, young adults filled in 6 items in contrary to experts which filled in 2 items.*
[c] *2 sexual health caregivers participated in this research. Both sexual health caregivers filled in the system factors questionnaires twice, explaining the N of 4.*

(perceived caregiver credibility, communication) is found in Appendix I. Table 13 shows the mean and standard deviation per eHealth service. No significant differences were found. The category Design aesthetics shows a nearly significant difference between email and chat (3.01 vs. 2.42, p=0.07). When differences between young adults and experts are analyzed. Other comparisons, such as differences between boys and girls were made, but no differences were found on either one of the categories.

The results of the scenario-based test with young-adults contributed to the evaluation checklist.

3.2 Study 2: An evaluation checklist

Through an iterative process described in the section … (Methods) with both experts from the RIVM and the University staff an evaluation checklist was created (Table 14). Once all the required fields are filled in the checklist it gives a quick overview on the eHealth service development. It is an important tool to compare diverse eHealth services, especially with regards to differences in the development and implementation process. Appendix I shows the final version of the evaluation checklist. Several categories from PSD model are integrated, for example categories focused on the target group and a category focused on the caregivers. eHealth service developers and public health managers stressed the importance of the iterative development process and the involvement of the end-users in eHealth evaluation.

The eHealth checklist was used by an eHealth expert to rate the development process of one of the Sense pilots. The expert stressed the need for a clear structure and categories in the checklist. The checklist was adjusted after the feedback to make it more tailored. Dropping the five point Likert scale and exchanging it for three possibilities of assessment is an example of this tailoring. Time limitations restricted the practical use and further validation of the final version of the checklist. The checklist distinguishes seven categories (Table 14). The first category addresses the objective of the pilot and its achievements and was added to describe the direction of the eHealth service. The second category is about the added value of the eHealth service with regards to the already existing services. The RIVM stressed in their framework for funding the program that eHealth service should be new and innovative. In this case, innovation does not exclusively mean using modern technology such as eHealth, but also differentiation from existing face-to-face services. The third category described the

Table 14: Checklist to evaluate eHealth services

Nr	*Category*	*Item*
1	Objective	*In the project plan an objective is described, the results section reflects on this objective.*
		The objective was achieved
2	Added Value	The added value of the eHealth service was proven in regard to other services
3		The eHealth service connects with other regional/national services
4	Feasability of implementation	*An implementation strategy was used in the proces. An implementation strategy is a plan from idea to realization were different facets are described, such as the results, the direction, the design, the prototype testing and training.*
		The implementation strategy was worked out and tested.
5		*An overview of the number of working hours and corresponding costs was given (e.g. design by an external party). The results section described in which way the project has been realized in the number of hours.*
		The budget and/or hours were adequate for implementation
6		*Description of prerequisites which are necessary to carry out a project, such as: the availability of personnel, availability of IT and/ or research facilities. The organization described a realistic planning and organization of the implementation of the pilot.*
		The prerequisites are feasible and realizable
7		*An important aspect is to what extent this eHealth service is can be unfold. It means the degree in which the initial pilot could be implemented nationally.*
		Further implementation on national level is feasible
8	Measurement of effects	Measurements of effects of the eHealth service are structured by means of validated instruments.
9	Target Group	The eHealth services have the common goal to reach out to reach out for target groups which are hard to reach.
		There is clear evidence that the intended and/or new target groups were reached with this eHealth service
10		There is a clear understanding of factors which improve/hinder reaching out to the target group
11		*A service is used by the target group. Use means that the target group adopts the service in their situation (for example, looking up a chat and ask questions, utilize given information). The frequency handles how often this is done (e.g. 3 chats a day, 800 visitors a month).*
		The actual use including frequencies of use of a service is measured and compared with the expected use.
12		That target group sufficiently entangled in development and evaluation.
13		The service tunes up to the needs of the target group.
14		A research on client satisfaction was conducted.
15		*The target group are often not without a reason at an online service. A service can give insight in reasons why the target group is using or not using that specific service.*
		There is a clear understanding of reasons why the target is, or is not using the service.
16		Drop-out (the caretaker quits during the treatment) and the motives for non-compliance are mapped
17	Caregivers perspective	The service meets the caregivers expectations
18		*The service meets the caregivers style of work*
19		A summative evaluation was conducted with the caregivers
20		A formative evaluation was conducted with the caregivers
21		Caregivers are trained to be able to use the eHealth service
22		A competence profile describes a function and the corresponding results, vital behaviors and competences explicitly and in a measurable way.
23	Quality of care	Attention has been given to the a substantial discussion of cases trough supervision or discussions with colleagues.
24		Criteria are written down or guidelines were developed for references and risk-taxation.
25		The service was automated/standardized if possible (think about standardized responses)
26		A social map embodies an overview of neighbor- and/or relevant services to where caregivers can refer
27		*A secured online environment can be used to secure information safety when it comes about email or chat contacts.*
		The service was developed and functions in an secure (web) environment.
28		Client conversations are always guided by guidelines (e.g. protocols)

feasibility of implementation in terms of strategy and budget. This category was added because on management level an eHealth service is restricted by the available budget. Management teams have a vision, based on the objectives, for how the eHealth service should be implemented. Based on this vision, a fund was given to the eHealth service. The fourth category focusses on the measurements of effects, which can be done by standardized validated questionnaires. Although this evaluation checklist compares a variety of different eHealth services, some have a form of standardization within the pilots itself, such as the use of questionnaires before and after the service. The fifth and sixth categories focus on end-users, the target group and the sexual health caregivers, respectively. As discussed before, literature stresses the importance to integrate the opinions of target group (young adults) and users (caregivers). The final category focusses on the quality of care in terms of trainings, supervision and standardized services (e.g. standardized content in email conversations).

The aim of study 1, which primarily addressed the quality of care, contributed to the development of this generic evaluation checklist, as can be seen in the last category (Table 14). The quality of care focuses on conditions which are, according to the eHealth service developers and public health managers, necessary to facilitate a certain amount of quality of care. Cases were described in all interviews as criteria to improve expertise and practical knowledge of the caregiver. Knowledge of how the system works is fundamental for accurate sexual health care. Criteria in this category do not describe any content and practical counselling techniques of the caregiver since the one using this document are policy advisors, eHealth experts and management teams.

Study 1 (the scenario-based user evaluation) and study 2 (the checklist to evaluate eHealth services) are supplemental to each other. Study 1 focuses narrowly on the opinions of both the target group (young adults) and users (caregivers) on micro level. In contrary, study 2 focuses on the policy advisors, eHealth experts and management teams. Together the studies cover the most important stakeholders in the development of an eHealth service in public sexual health care.

4. Discussion

The purpose of this study was to summarily evaluate several online public eHealth services from the perspectives of several different stakeholders such as young adults, sexual health caregivers and eHealth experts. The main research question in this research was '*What are critical points for an evaluation guideline to evaluate diverse developed eHealth services, in particular online interventions in public sexual health care?'* The summative evaluation is highly formative (Van Gemert-Pijnen et al., 2011), since the eHealth services will continue to improve. This resulted in two studies, of which the first was the most important, and thus, largely described.

In study 1 two chat- and two email services within online public sexual health care in the Netherlands were evaluated using a scenario-based user evaluation. The research question of this study was: '*What is the current status of the existing anonymous online eHealth interventions in public sexual health care from the perspective of the end-users (caretakers) and sexual health experts (caregivers)?'*. In the following paragraphs the most important results are discussed. Results of the first study contributed to the development of the generic guidelines in the second study. The research question in the second study was *''How can a generic evaluation checklist be developed for diverse online interventions in public sexual health?'*. In this research the most important categories are described.

Results of the first study contributed to the development of the generic guidelines in the second study. Firstly, this research embodies the operation and practice of the eHealth services (study 1) through a scenario-based user evaluation with young adults and sexual health experts. Secondly it enabled the creation of an evaluation tool meant for eHealth experts and policy makers to use during the development process of eHealth services in online public sexual health care. Any form of cost-benefit analysis and efficiency evaluation is excluded from this research.

4.1 Online versus face-to-face preferences

In study 1 sub-research questions were 1) '*What do young adults and experts think of online public sexual health interventions?'*, 2) *'To what extent do the online public sexual health interventions address the needs of the young adults and experts?'* and 3) '*Which improvements should be made to the online public sexual health interventions according to*

young adults and experts?'. Most of the young adults (36.4%, N=16) preferred a professional face-to-face dialogue instead of a telephone (11.4%), skype (2.3%), chat (22.7%), or email (15.9%) conversation via eHealth services. This finding is of high interest because the trend over the last years is that online forms of health care, in any form, are receiving more and more interest (Van de Belt et al., 2013). This can be possibly clarified by a cultural influence. Native Dutch participants expressed a higher interest in eHealth services than second-generation foreigners, who primarily chose for family and friends as their first source of help. Table 9 shows that most (N=26) of the participants were born as Dutch nationals. Several participants (N=15) were second-generation foreigners. Some of them had, for example, parents of Turkish origin. In cultures such as the ones from Turkey or Morocco the family is highly valued. The father is often the leader and the most important person in the family and the family follows his wishes with high fidelity (Kagitcibasi & Ataca, 2005). To reach out to second-generation foreigners remains a challenge. Related studie conform that Dutch natives with parents of foreign origin are difficult to reach (Vanwesenbeek, Bakker & Gesell, 2010). In most researches that have been conducted in the Netherlands it was defined as a drawback. With that in mind, the comments in this research are highly valuable, since the results do not only reflect opinions of the native Dutch, but also the second-generation foreigners.

Chat service as a form of online communication (N=10) seemed slightly more popular than email (N=7), both were mentioned as less suitable for the respective Persona than a professional face-to-face dialogue. This is partly in line with the expectations from Van de Belt et al. (2013). Although they were aimed especially at general health seeking behaviour, the discussion was that one in four Dutch citizens prefered to contact their physician via a webcam. On the other hand Van de Belt et al. (2013) argues that they expect a rapid growth in coherence with an increase in mobile phone and tablet use. The young adults preferred the ace-to-face dialogue most of the time. A few explanations are possible. First, one notices while looking at the distribution of the type of communication that young adults find suitable, (table 10) that most of young adults who chose face-to-face conversations (36.4%, N=16) evaluated Persona 2, the heavier case, which is two times more than Persona 1 (N=8, light case) and four times more than Persona 3 (N=4, light case). Persona 2 showed a 21-year old female with a past full of physical and sexual abuse. The other and most likely explanation is that Persona 2 made a stronger impression on the participants than the other two Personas. Young adults recognized the complexity of the problems and thought that it was too much for

a chat or email service. The young adults mentioned that they were startled by this Persona. Some did not expect abuse, others, especially between 12-15 years old were frightened. Most of the participants did not realize that this much of abuse could happen to one person at such a young age. The older young adults were less startled, but still the second Persona stuck in their memory the most. Both experts acknowledged that a professional face-to-face dialogue could deliver good results most of the time since this is the traditional way and caregivers are more experienced in this method.

A second explanation is that young adults simply did not know about any forms of online help for public sexual health care. Almost all young adults (N=26, 92,8%) had never used any form of online public sexual health care before. In addition, the very existence of online public sexual health does not per se lead to their utilization. Merely making online health sources available does not mean that these will be used (Feng & Campbell, 2011; Kauer, Mangan & Sanci, 2014). When help-seeking behavior is established, young adults are still tempted to first use search engines such as google to search for an answer to their questions, instead of other means (Neal, Campbell, Williams, Lio & Nussbaumer, 2011). These results are contrary to a non-peer-reviewed local report about sexual health support preferences of young adults which was commissioned by the RIVM. Qrius (2010). The report stated that young adults preferred online support over face-to-face dialogue because of the low threshold that online support has. The results in this research indicates however that young adults have a preference for friends and family over professional health care services and thought that face-to-face dialogues were more suitable for the Personas they evaluated. In some research young adults simply prefer face-to-face dialogues over online support (Horgan & Sweeney, 2010).

Both young adults and sexual health caregivers found the Personas realistic. They acknowledged in all three Personas that help was needed. Sometimes participants gave advices, for example that Persona 3 needed to gain confidence in order to be able to be honest about his sexual orientation. This is in line with Rosson & Carroll (2002), who already stated that a scenario is a powerful design representation. With regards to the needs of the Personas the young adults were ambiguous. In the case of Persona 1, which was marked as a light and simple case (Table 3, Annemiek) information received from the online eHealth service seemed sufficient. She requested information about first time sex, and the information given to her seemed to answer her questions. In addition, experts summarized that when she was put

at ease and her questions were answered that this should be sufficient. In the case of Persona 2, the young adults acknowledged the complexity of the problems and stressed that she needed professional support. There she would be able to learn to say no and stand-up for herself. In contrary to Persona 1, in the case of Persona 2 (Table 3, Paulien), which was marked as the most complex case, it was less clear about what she wanted and still a little ambiguous as to whether she even wanted support. Persona 3 (Table 3, Marco), the boy who was wrestling with his feelings for men and the social pressure that it is wrong to love men, was more in line with Persona 1 and less ambiguous than Persona 2. This is in line with Miller & Rollnick (2013) and Lang & Van der Molen (2013) who describe fundamental methods of therapist skills. Although the focus of their therapist skills is somewhat different (motivating a client through creating discrepancies versus basis therapeutic skills) they both describe the importance of the client having a clear question or need. With a straightforward need, such as in Persona 1, it is easier to work towards an answer than that of Persona 2. So it seems more logical that Persona 2 is referred to the professional face-to-face services.

4.2 Expectations

Assuming online health care did not exist, young adults summarized their preference for family and friends. Family was, with 40.5% (N=15), marked as the highest preferable place for young adults to speak about their problems, followed by friends with 27% (N=10). Rated third was professional support (16.2%, N=6). Over the last 40 years the attitude towards professional support has been increasingly negative in a linear direction (Mackenzie, Erickson, Deane & Wright, 2014). It is most likely due to the fact that young adults choose to first turn to their friends and family before they seek professional support. Some research underlines the fact that young adults will have a tendancy to speak with their friends about mental health issues first (Hennig, Crabtree & Baum, 1998; Hunt & Eisenberg, 2010). Two people were even willing to proclaim the sexual abuse of Persona 2 to the police, which could be explained by the more explicit role of boyfriends and relationship problems in Persona 2 than in the other two Personas. Experts and young adults expected the Personas to be reserved in what he or she was willing to tell to the caregiver. They thought that it would be necessary for the caretaker to learn to trust the caregiver first. This is in line with literature about the therapeutic relationship (Elvins & Green, 2008; Sucala et al., 2012). At first a caretaker is not so willing to be open about his or her situation. In most cases the young adults thought that the conversations corresponded more or less to their expectations. This means that the young

adults were neither completely convinced, nor completely rejecting the dialogue. Most of the young adults would have taken the same approach. Again, young adults would be more reserved at the beginning with regards to elaborating on their story. A few stressed that an online chat or email service would not be their first preference. They would turn to friends or family first as explained previously.

The sexual health caregivers were more critical and disagreed on the way the caregiver approached the young adults. In one case a sexual health caregiver even condemned the way the caregiver was supporting the young adult. The caregiver in that scenario started off with the information that underage sex is punishable. In contrary to the literature, which states that trust, warmth and empathy should be the first steps in either face-to-face or online dialogues, this anonymous caregiver was severe in his opinion (Elvins & Green, 2008; Castonguay, Constantino, & Grosse Holtforth, 2006; Andersson et al., 2012). Emphasizing common ground and working together (Creed & Kendall, 2005) have been deemed important over the last thirty years (Del Re, Flückiger, Horvath, Symonds & Wampold, 2012). While reading and hearing the scenario the reviewing sexual health caregiver jumped from disapprovement of the communication skills on the sexual health caregiver from the respective eHealth service. According to the sexual health experts, this dialogue was an example of a worst-case scenario. The sexual health caregiver asked the researcher several times if this was an actual scenario. The other dialogues were rated more positively. Both experts thought of the conversations as shallow and stressed that with a face-to-face conversation they should have questioned the young adult further to crystallize all information so that they could have given more precise and secure feedback. In one case the sexual health caregiver who participated in the study was enthusiastic, because they felt the questions were very clarifying. In general, the sexual health caregivers who participated in the study were not fond of the sexual health care provided in the chat and email service and stressed that improvements are needed. Though the sexual health caregivers were critical, lower scores were given by the caretaker on the category of communication. This category embodied items about the conversion. An example of this is how pleasant the conversation was or if appropriate counselling was given. The perceived caregiver's credibility was rated low by the participating sexual health caregivers, which is in line with their statements. In contrary to the results of the scenario-based user evaluation, they did underline their interest in using more online health care in their daily practice.

4.3 The system

The following aspects of the system were measured: perceived system credibility, design aesthetics, unobtrusiveness and usability. No significant differences were found on system factors. Participants were asked to fill in questions about system factors on a five-point Likert scale (strongly agree, agree, neither, disagree, strongly disagree). While looking at the scores one can notice that most scores are between 2 and 2.5, which means that participants 'judged' the eHealth services overall as a 'disagree'. Scores are relatively low, but also relatively consistent. All four eHealth services are not only different in design, but also in the way they cope with sexual health problems. Each health care area has its own rules and demands and the eHealth services have been designed according to this (Kelders, Kok, Ossebaard & Van Gemert-Pijnen, 2012). On one hand all eHealth services aim to deal with sexual health care issues but these services are situated throughout the whole of the Netherlands. The question that remains is '*does the eHealth service fit with the target group?*'. The results on system aspects gives some insight into this.

Perceived system credibility, an attribute of the object of interest (to be credible) encompasses trust, reliability, credibility and believability (Lehto, Oinas-Kukkone & Drozd, 2012). The low scores mean that young adults did not think of the eHealth services to be reliable, credible, believable or trustworthy. It is very likely that when an eHealth service scores low on all these factors, that young adults will tend to abandon the service or not adopt the service at all (Neil, Campbell, Wiliams, Lui & Nussbaumer, 2011). User satisfaction is firmly predicted by the visual aesthetics of the computer interface (Lehto, Oinas-Kukkonen & Drozd, 2012). Chat was rated relatively, but not significantly, higher on design aesthetics then emiail. Lehto, Oinas-Kukkonen & Drozd (2012) discuss this point and say that satisfaction and pleasure is strongly predicted by a computer interface. Although the difference is small, it is likely that young adults like the chat interface more than an email interface. Still, both interfaces scored a bit above 'Neutral'.

Unobtrusiveness, the way in which users can integrate the system into their daily life (Oinas-Kukkonen & Harjumaa, 2009), is the only factor in which both email and chat services scored above a 3 and thus, scored relatively higher than the other system aspects. Still, scores were a little bit more than 'Neutral' and less than 'Agree'. Young adults seem to somehow be able to integrate the system into their daily life. Possibly because of the increase in tablet and mobile

phone use (Van de Belt et al., 2013). Still, scores are merely mediocre, which means improvements can be made. More research is necessary, specifically on the barriers for adopting these four eHealth services. Usability is about '*the capability to be used by humans easily and effectively*' (Shackel, 1991, p24; Horbaek et al., 2006). This factor was adopted to gain insight in how 'usable' young adults found the eHealth services. Scores were around 2.5, which is a little less than neutral. These scores mean that young adults don't think of the eHealth services as being easy to use.

4.4 General guidelines

The fourth and last sub-research question in study 1 was '*What general guidelines can be generated for developing anonymous online eHealth services for public health promotion targeting young adults?'*. Although both young adults and sexual health caregivers are interested in online support via eHealth services such as email and chat, the tendency in the responses of both groups are not entirely positive. During the whole study the responses were more oriented on the caregiver than on the system. The caregiver was marked as very important. The disapprovement of the caregivers actions by both the sexual health caregiver and young adults in one of the scenario's shows the importance of the communication skills of the caregivers. Previous research showed the importance of the caregiver in an online treatment (Roskam, 2013; Paxling et al., 2013) and proposed a generic rating scale to train the caregiver in online support (Ziel, 2013). Most participants described the eHealth services as an interesting change of health care and were interested in the further use of such services in daily practice. Not only does the system need to be credible and reliable, but young adults also want to be taken seriously. Sexual health caregivers need to be trained sufficiently in therapeutic skills such as motivational interviewing (Miller & Rollnick, 2013). Although there are a lot of similarities, to be trained in face-to-face counselling does not mean that the caregiver is able to apply the same skills online.

4.5 The evaluation checklist

The second product of this research is the evaluation checklist (see Appendix II and III) which was developed in study 2. In study 2 the sub-research questions were 1) '*Which aspects and/or evaluation models are important in an evaluation checklist for evaluation of diverse online interventions in public sexual health?'*, 2) '*What do public health experts and policy makers expect of such an evaluation checklist?'* and 3) '*Which developmental aspects should*

be integrated in an evaluation checklist for evaluation of diverse online interventions in public sexual health?' The results of the scenario-based user evaluation contributed to the design of the checklist. The main aim of this checklist was to create a tool for evaluating the diverse eHealth services during the development process by eHealth experts, public health experts, managers and policy makers. Although based on a public sexual health care case, the checklist is not limited to it.

Reactions on the checklist were positive and contributed to the iterative development of the checklist. It is important to notice that the checklist has not being validated in practice and thus more research on its practical use is necessary. In addition, the ones using the checklist, eHealth experts, experts in online health care support and project managers of the municipal health services, are not the ones with expertise about counselling. Their expertise is mainly on implementation, dissemination and the prerequisites of both of these. Therefore, the checklist should not be used as a stand-alone evaluation tool and should preferably be integrated with other evaluation tools. Involvement of the target group in evaluation remains essential. The checklist is an innovative tool and easy to use due its meta-focus on the development process. The checklist is also not time restricted. It can be used at any time while developing eHealth services to create an overview of the development process. In regard to the content, related studies have to be included for the further validation of the checklist to support eHealth development (Van-Gemert-Pijnen, 2011; Pagliari, 2007).

4.6 Limitations

The combinations with Personas, real-time scenarios and scenario-based testing, brought some limitations to the process. The initial purpose was a mystery shop study, which was restricted by the method itself, namely, an ethical issue was encountered. When you mystery shop, you deliberately let the target group take part in the eHealth service. The number of eHealth services is small and most of them had only one caregiver active at a certain time frame. Most mystery shop studies (Ford, Latham, Lennox, 2011; Glacier, Manners, Londen & Muir, 2010; Sykes & O'Sullivan, 2006) send large groups of people with a specific task (e.g. underage alcohol sales) to a specific service (e.g. liquor stores) (Gosselt, Van Hoof, De Jong & Prinsen, 2007). The eHealth services included were new, small and in their prototype stage. Mystery shopping would have deliberately influenced the results of each prototype. Using Personas to gather real-time scenarios created another limitation. Although the researcher was

not much older than the target group (25 years old) it could still have biased the data. To the contrary the young adults found the scenarios recognizable and realistic. One important comment mentioned by a young adult was would a real young adult have asked such precise questions (as in the scenario with Persona 1) and would they have been so honest about sexual abuse (Persona 2).

A second limitation was the content-validity, specifically the questionnaire used in the scenario-based evaluation. Questions were based on PSD (Oinas-Kukkonen & Harjumaa, 2009), usability (Horbaek, 2006), communication studies (Creed & Kendall, 2005) and sexual health studies (Op de Coul et al., 2012). With regard to PSD several categories, such as unobtrusiveness and design aesthetics were mentioned (Lehto, Oinas-Kukkonen & Drozd, 2012; Lehto, Oinas-Kukkonen, Pätiälä & Saarelma, 2012). A recent study from Lehto & Oinas-Kukkonen (2014) had already started to use slightly different categories than the previous ones mentioned. The questionnaire was already in use at that moment and could not be updated to the latest available literature. At a later stage of the research it was noticed that some of the factors, such as primary task support, were not measured as intended and was actually presenting another topic. That topic was communication, resulting in an incomplete PSD scale. On the other hand, communication was a topic that was debated in the interviews and in the qualitative information from the young adults and sexual health caregivers, which shows that it is an important topic. In addition, the number of items differed in the categories. For example in the category of perceived system credibility only two items were aimed at explaining this category, in the category of perceived caregiver credibility it was just one. The general effect is that the content validity of the constructs in the questionnaire could be questioned. It is suggested to thoroughly research the constructs and create a reliable and validated questionnaire to measure PSD. With regards to the sexual health studies the same question could be asked. Questions are formulated based on the research questions and discussions between sexual health caregivers and eHealth experts. Though the questions delivered profitable results it could be questioned if the way of measuring them was appropriate.

The use of the Likert-scale could have led to a central tendency bias. Participants may have avoided extreme categories (e.g. strongly agree and strongly disagree) (Bertram, 2012). Although there are no specific signs of a central tendency bias, results are in most cases nearly central. This could for example be explained by the voluntary character of this research. At

least two participants were suspected that they only participated in the study to get the incentive of 12.50 euros. Thus, also a voluntary bias is another possibility.

The number of participants is another limitation. Though we were aiming for 32 young adults we were only able to gather 28. The missing four would have made up the number of young adults at eHealth service C Email 1 and D Email to 8 each. The number of young adults would then have been equally distributed over all eHealth services. The result of the missing two pairs was that Persona 3 was only evaluated and used by four young people. Hwang & Salvandy (2012) discuss that at least 10±2 users should be consulted. This means that a number of 8, as achieved in two of the three Personas, was the absolute minimum and more would have been preferred. Therefore, results should be interpreted carefully since the number of participants per eHealth service and per Persona was low. It is highly possible that the missing values resulted in a bias due to the small amount of participants. In addition, two participants were not able to fill in the questionnaires completely. This resulted in some of the values being missing. Due to the small number of total participants every missing value could have biased the results.

4.7 Strengths

A notable strength of this study is that quite a number of boys participated. Though not limited to only sexual health care, young men are less likely to seek online health care than young women (Addis & Mahalik, 2003; Burns, Davenport, Durkin, Luscombe & Hickie, 2010; Horgan & Sweeney, 2010). Although young men are often high internet users (Ellis et al., 2013), it is often women who turn to support (Op de Coul et al., 2012). In addition, a large number of second-generation foreigners joined the study. First and second-generation foreigners are generally hard to reach within the Dutch sexual health care (Qrius, 2010).

This study is the first of its kind which presents a scenario-based user evaluation based on real-time interactions. A scenario is mostly used as a prediction to base decision on (Pommeranz, Brinkman, Wiggers, boekens & Jonker, 2009). Although several studies used the concept of mystery shopping to gain specific information, none have used real time scenarios. However, in scenario-based testing, scenarios and Personas are more common but never retrieved real-time. In addition, this combination was not used before in online public sexual health care.

4.8 Practical Implications for public health

The implications of the results presented in this study are severe. Generally, both young adults and sexual health caregivers were not enthusiastic about the state of the online public sexual health services. Results show low scores on system factors and on communication, and a preference for face-to-face sexual health care and critical remarks from the sexual health caregivers. In practice it means that young adults are more likely to abandon the eHealth service and maybe not adopt the services at all (Neil, Campbell, Wiliams, Lui & Nussbaumer, 2011). These results implicate that, although wonderful steps were taken, a long road lies ahead for the eHealth service to improve.

4.9 Future Research

It is suggested to repeat scenario-based testing with 1) larger samples and 2) samples that truly represent the Dutch population. A larger sample per eHealth service could give more insight into which aspects of the specific eHealth service should be improved. Although Hwang & Salvendy (2010) argue that a sample size 10±2 is enough for usability evaluation, this research only managed the minimum (N=8) in two of the four scenario-based user evaluations.

eHealth services can also be improved by adopting the theories of PSD. Literature stresses that adherence to an eHealth service can be approved by adapting the appropriate means in regard to persuasive factors (Kelders, Kok, Ossebaard & Van Gemert-Pijnen, 2012). This can be done by, for example, letting young adults participate in the development of the eHealth service (Van Gemert-Pijnen et al., 2011).

Therapist's skills and communication were emphasized more than once as being important. The therapeutic relationship seems to have become more and more important. Few researches have explored the therapeutic relationship (Andersson et al., 2012) or explored therapeutic skills in eHealth services (Paxling et al., 2013; Roskam, 2013). In face-to-face counselling the importance of therapeutic skills and therapeutic alliance has proven itself more than once (Castonguay, Constantino & Holtforth, 2005). However, with regards to eHealth services, which make use of email and chat, the therapeutic alliance has not yet been researched. Future research should focus on the therapeutic alliance and the therapeutic skills in eHealth services.

Research on the PSD (Oinas-Kukkonen & Harjumaa, 2009) primarily focuses on the system. It argues the support of the system with regard to a specific goal of the users. Through the analysis of the specific role of the system, it can be adjusted and tailored to the needs and wishes of the target group. Most of the time the system is a static whole which leaves the user with a specific impression, for example, credible, reliable and trustworthy. This research stresses that in eHealth services the role of the caregiver has an influence on how young adults perceive the system. Though not supported by correlations or a clear connection, the reactions received from both young adults and sexual health caregivers were primarily aimed at the caregiver of the eHealth service. Thus, the reactions show that there is some kind of connection. Future research should focus on extending the PSD theory specific to eHealth services with an interaction component, such as email and chat. In addition, the influence of the caregiver's role on how young adults perceive a system (or the other way round) should be researched.

4.10 Conclusion

Online public sexual health is an emerging field in the Netherlands. The rapid evolution of available online technologies presents challenges for the development, uptake and impact of specific eHealth services. This study confirms that the field of online health care is still young. The eHealth services evaluated in study 1 still have a long way to go with regard to, for example, therapeutic skills. The four participating eHealth services are still in their prototype phase in public sexual health care in the Netherlands which is seen to be beneficial for the future.

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4.12 Conflicts of interest

This is a student's master thesis. The author received European Credit's (EC, curriculum points) for doing this research. No further conflicts are declared.

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Appendix I: Overview Questionnaire Scenario-Based Testing

Table AII-1: Overview of Questionnaire in Scenario-Based Testing

Categories	*Sources*	*Questions (English)*	*Questions (Dutch)*	*Original questions*
Caretaker				
Demographic information	Adapted based on Op de Coul et al. (2012) and on Kulyk et al. (2013)	Gender, age, ever had sex (yes or no), education, country of origin, usage of sexual health care (q1-10)	1. Wat is je geslacht? 2. Wat is je leeftijd? 3. Heb je ooit seks gehad? 4. Wat voor opleiding doe je? 5. Waar ben je geboren? 6. Uit welk land komt jouw vader? 7. Uit welk land komt jouw moeder? 9. Wat voor locaties/plekken/websites ken je waar je terecht kunt voor online hulpverlening op het gebied van seksualiteit? 10. Heb je wel eens gebruik gemaakt van online **seksuele** hulpverlening?	
Openness	Adapted from Del Re, Flückiger, Horvath, Symonds & Wampold (2012)	For questions about sexuality I can talk to family and friends (q11) I think it's difficult to talk about sex (q8 & q31)	11. Voor de vragen rondom mijn lichaam, liefde, de eerste keer seks en mijn seksualiteit kan ik makkelijk bij mijn vrienden en/of familie terecht. 8. Ik vind het moeilijk om over seks te praten 31. Ik vind het moeilijk om over seks te praten	
The system				
Expectations & Sympatizing with Persona	Adapted from Andersson et al. (2012)	Imagine you were the person of the Persona. What would you have done if online support did not exist? (q14) What would support the person in the Persona the most? (q15) Have you ever heard of Sense before this research (q28)	14. Stel je eens voor dat jij de persoon uit de casus bent. Stel je daarnaast ook voor dat online hulpverlening rondom seksualiteit niet bestaat, wat zou jij gedaan hebben? 15. Waarmee zou de persoon in de casus het meest geholpen zijn? (denk aan informatie, een verwijzing, of iets anders)	

		You described your expectations about this conversation earlier on. How do you look back at these expectations? (q30) Imagine you are dealing with questions on sexuality. Would you use a form of online support? (q44)	30. Heb je vóór dit onderzoek wel eens gehoord van Sense? 32. Je hebt bij deel 2 aangegeven hoe je verwachte dat dit gesprek zal lopen. Hoe kijk je nu terug op je verwachtingen. 42. Stel je voor dat jij ergens mee zit op seksueel gebied en dat je hier meer over wil weten. Dit kan van alles zijn, zoals bijv. te vroeg klaar komen, pijn bij vrijen, onzekerheden rondom de eerste keer, homoseksualiteit en nog veel meer.	
Persona Validity	Adapted from Del Re, Flückiger, Horvath, Symonds & Wampold (2012) and Pruit & Grudin (2003).	Do you think this Persona is suitable for online support? (q12) Which form of contact do you think suits this Persona the most? (q13) How do you expect the conversation will come along? (q16) You have now seen the conversation, is this how you would have conversated? (q17)	12. Vindt jij deze casus geschikt voor online hulpverlening? 13. Bij welke vorm van contact vindt jij deze casus het meest geschikt, 16. Hoe verwacht jij dat dit gesprek zal lopen? (wat denk jij dat de persoon in de casus bijv. wel zou vertellen, wat niet) 17. Is dit hoe jij het gesprek ook gevoerd zou hebben?	
Perceived System credibility	Adapted based on Oinas-Kukkonen and Harjumaa (2009) & Busch, Schrammel Tscheligi (2013)	I find the application to be credible (q37) I find the application to be reliable (q38)	37. Ik vind de applicatie geloofwaardig 38. Ik vind de applicatie onbetrouwbaar	37. NIV is trustworthy 38. NIV is reliable
Design aesthetics	Adapted based on Oinas-Kukkonen and Harjumaa (2009)	The general appearance of the application is appealing (q39) The screen of the application(i.e. colours, layout, presenters, etc.) is attractive (q40)	40. Over het algemeen, spreekt de applicatie (de vormgeving van de chattool of email systeem) mij totaal niet aan. 41. Het uiterlijk (bijv. kleuren, layout etc.) van de applicatie (bijv. chat tool of email systeem) is aantrekkelijk	40. The general appearance of NIV is appealing 41. The screen in NIV (i.e. colours, layout, presenters, etc.) is attractive
Unobstrusiveness	Adapted based on Oinas-Kukkonen and Harjumaa (2009)	Seeking information about sexuality fits in my daily activities (q26) Using chat/email tool would disturb my daily activities. (q27)	26. Informatie over seksualiteit opzoeken op deze manier past in mijn alledaagse activiteiten. 27. Het gebruik van chatttool / email tool zou mijn	26. Using NIV fits into my daily life 27. Using NIV disrupts my daily routines

			alledaagse routine verstoren.	
Usability	Adapted from the Website Evaluation Questionairre (WEQ, Hornbaek (2006)	The information influences my way of seeking sexual health support (q25) The application is easy to find (q29) I think seeking the information takes too long (q33) I find it difficult to seek information about sexuality (q34) It's clear to me where I can find information about sexuality (q35) I think information about sexuality is quickly available for me. (q36)	25. De verkregen informatie beïnvloedt mijn manier van zoeken naar informatie over seksuele gezondheid. 29. Het vinden van de applicatie gemakkelijk. 33. Ik vind dat het opzoeken van informatie lang duurt 34. Ik vind het lastig om informatie te zoeken over seksualiteit 35. Het is mij duidelijk waar ik informatie over seksualiteit kan vinden 36. Ik vind dat informatie over seksualiteit op een snelle manier beschikbaar is voor mij.	25. De informatie over seksualiteit beïnvloedt mijn manier om naar informatie te zoeken 29. Ik vind het gemakkelijk om informatie over seksualiteit te zoeken 33. Ik vind dat het opzoeken van informatie lang duurt 34. Ik vind het lastig om informatie te zoeken over seksualiteit 35. Het is mij duidelijk waar ik de informatie over seksualiteit kan vinden die ik zoek (bijvoorbeeld op de Facebook pagina of in de mobiele applicatie). 36. Ik vind dat informatie over seksualiteit op een snelle manier beschikbaar is voor mij
Caregiver				
Communication	Adapted based on Creed & Kendall (2005), Lang & Van der Molen (2013), Miller & Rollnick (2013), Roskam (2013), Oinas-Kukkonen and Harjumaa (2009) & Busch, Schrammel Tscheligi (2013)	Responses given by the caregiver are appropriate (q20) The information given by the caregiver answers my question (q21) The received information is appropriate (q24) I think this is a pleasant conversation (q18) I feel understood by the caregiver (q19) The caregiver provides me with appropriate counselling (q22)	20. De reacties van de hulpverlener zijn ongepast 21. De informatie die gegeven wordt door de hulpverlener beantwoord mijn hulpvraag 24. De verkregen informatie is relevant/sluit aan op het beantwoorden van de beginvraag 18. Ik vind dit een prettig gesprek. 19. Ik voel me onbegrepen door de hulpverlener 22. De hulpverlener biedt mij de juiste hulpverlening	20. NIV provides me with appropriate counselling 21. NIV provides me with appropriate feedback 24. De informatiebronnen bevatten informatie waar ik wat aan heb (bijvoorbeeld de informatie Facebook pagina of in de Youtube filmpje). 18. see thesis (no specific question) 19. see thesis (no specific question) 22. NIV provides me with appropriate counselling
Perceived caregiver credibility	Adapted based on Oinas-Kukkonen and Harjumaa (2009) & Busch, Schrammel Tscheligi (2013)	I think the caregiver shows expertise (q39)	39. Ik vind dat hulpverlener van expertise getuigt	39. NIV shows expertise

Note: all constructs were modeled as *reflective*

Appendix II: Evaluation checklist to rate eHealth Sense interventions

The following pages embody the evaluation checklist to rate eHealth Sense interventions. This evaluation checklist is in Dutch, as in was used in the Netherlands. Translations of each criteria can be found in Appendix II.

Evaluation Checklist for eHealth interventions

\+ = Aan het criterium wordt in voldoende mate voldaan.

O = Niet van toepassing. Dit betekent dat het criterium niet relevant is voor de eHealth service of niet geëvalueerd kan worden.

– = Aan dit criterium wordt onvoldoende voldaan

De doelstelling van deze checklist is om eHealth services in de publieke gezondheidszorg te evalueren vanaf het perspectief van de beleidsmaker, eHealth experts en eHealth managers.

	Algemene eHealth richtlijnen			
1	*In het projectplan staat een doelstelling van het project beschreven. In de resultaten wordt teruggekomen op deze doelstelling:* De doelstelling is bereikt. *Toelichting:*	+	O	–
2	De meerwaarde van de eHealth service is aangetoond ten opzichte van andere services. *Toelichting:*	+	O	–
3	eHealth service sluit aan op andere regionale/nationale/internationale services *Toelichting:*	+	O	–
4	*Een implementatiestrategie is een plan van het idee tot aan de realisatie waarin diverse facetten zoals het resultaat, de sturing, het ontwerp, het testen van het prototype en scholing worden meegenomen.* De implementatiestrategie is uitgewerkt en getest. *Toelichting:*	+	O	–
5	*In het projectplan is een overzicht gegeven van het aantal werkuren van personeel en de bijkomende kosten (bijv. extern ontwerp). In de resultatenomschrijving wordt omschrijven in hoeverre het project binnen dit tijdpad/aantal uren gerealiseerd is.* Het budget (incl. urenverdeling) voor implementatie is bijgehouden en valt binnen het tijdspad en het budget van het project . *Toelichting:*	+	O	–
6	*Randvoorwaarden kunnen omschreven worden om een service verder te kunnen implementeren in dagelijkse praktijk. Denk hier aan de aanwezigheid van personeel, nodige computers en/of vakkennis. De organisatie gaat in op in hoeverre deze zaken gepland, voorbereid en realistisch uitvoerbaar zijn.* De randvoorwaarden en organisatie rondom uitrol van de service zijn haalbaar en uitvoerbaar. *Toelichting:*	+	O	–
7	*Een belangrijk aspect is in hoeverre deze eHealth service op landelijk niveau uitrolbaar is. Dat betekent de mate waarin de initiële pilot service landelijk ingezet kan worden.* Verdere implementatie op een nationale niveau is haalbaar. *Toelichting:*	+	O	–

Evaluation Checklist for eHealth interventions

\+ = Aan het criterium wordt in voldoende mate voldaan.

O = Niet van toepassing. Dit betekent dat het criterium niet relevant is voor de eHealth service of niet geëvalueerd kan worden.

– = Aan dit criterium wordt onvoldoende voldaan

8	Effectmetingen van de eHealth service zijn gestructureerd door middel van gevalideerde meetinstrumenten. *Toelichting:*	+	O	–

	Doelgroep			
9	*De services gezamenlijk hebben als doel gesteld om meer moeilijk bereikbare doelgroepen te willen bereiken.* Er is duidelijke bewijs dat de beoogde doelgroepen/of nieuwe doelgroepen wordt bereikt met deze eHealth service. *Toelichting:*	+	O	–
10	Er is inzicht in factoren die het bereiken van de doelgroep bevorderen/belemmeren. *Toelichting:*	+	O	–
11	*Een service wordt gebruikt door de doelgroep. Het gebruikt betekent dat de doelgroep de service in hun situatie toepast (bijv. opzoeken van een chat en hier vragen stellen, het benutten van gegeven informatie). De frequentie gaat in op hoe vaak dit gedaan wordt (bijv. 3 chats per dag, 800 bezoekers per maand).* De daadwerkelijke gebruik inclusief frequentie van gebruik van een service is gemeten en vergeleken met het geplande gebruik. *Toelichting:*	+	O	–
12	De doelgroep is voldoende betrokken geweest tijdens ontwikkeling en evaluatie. *Toelichting:*	+	O	–
13	De service sluit aan op de behoeften van de doelgroep. *Toelichting:*	+	O	–
14	Er is een zorgvrager (klant) tevredenheidsonderzoek uitgevoerd. *Toelichting:*	+	O	–
15	*De doelgroep komt in de meeste gevallen niet zonder reden bij een online service. Een service kan inzicht verwerven in de redenen waarom de doelgroep juist bij die service wel/niet komt.* De service heeft zicht op de redenen waarom de doelgroep de service wel/niet gebruikt. *Toelichting:*	+	O	–

Evaluation Checklist for eHealth interventions

\+ = Aan het criterium wordt in voldoende mate voldaan.

O = Niet van toepassing. Dit betekent dat het criterium niet relevant is voor de eHealth service of niet geëvalueerd kan worden.

– = Aan dit criterium wordt onvoldoende voldaan

16	Uitval (het afhaken van een zorgvrager gedurende de hupverlening) en motieven voor uitval zijn in kaart gebracht. *Toelichting:*	+	O	–

	Hulpverleners			
17	De service sluit aan op de behoeften van de hulpverleners. *Toelichting:*	+	O	–
18	De service sluit aan op de werkwijze van de hulpverleners. *Toelichting:*	+	O	–
19	Er is een eindevaluatie uitgevoerd met de hulpverleners. *Toelichting:*	+	O	–
20	Er is tussentijds geëvalueerd met de hulpverleners. *Toelichting:*	+	O	–
21	Hulpverleners zijn getraind om gebruik te kunnen maken van deze eHealth service. *Toelichting:*	+	O	–
22	*Een competentieprofiel beschrijft een functie waarin te behalen resultaten, vereiste gedag en competenties expliciets en op toetsbare wijze omschreven zijn.* Er is sprake van een competentieprofiel voor de hulpverlener. *Toelichting:*	+	O	–

Evaluation Checklist for eHealth interventions

\+ = Aan het criterium wordt in voldoende mate voldaan.

O = Niet van toepassing. Dit betekent dat het criterium niet relevant is voor de eHealth service of niet geëvalueerd kan worden.

– = Aan dit criterium wordt onvoldoende voldaan

	Randvoorwaarden			
23	Er is aandacht besteed aan het inhoudelijk bespreken van cases via intervisie en/of supervisie. *Toelichting:*	+	O	–
24	Er zijn criteria opgesteld en/of richtlijnen ontwikkeld voor doorverwijzing en risico-inschatting. *Toelichting:*	+	O	–
25	Waar mogelijk is de service geautomatiseerd/gestandaardiseerd (denk aan bijv. standaard responses) *Toelichting:*	+	O	–
26	*Een sociale kaart bevat een overzicht van naburige en/of relevante services waar eventueel naar doorverwezen kan worden.* Er is een sociale kaart aanwezig voor doorverwijzing. *Toelichting:*	+	O	–
27	*Om de veiligheid van informatie te waarborgen wanneer er bijv. sprake is van email of chatcontact wordt er gebruik gemaakt van een beveiligde omgeving.* De service is ontwikkeld en functioneert binnen een beveiligde (web) omgeving. *Toelichting:*	+	O	–
28	Gesprekken met zorgvragers lopen volgens gestandaardiseerde richtlijnen (bijv. protocollen). *Toelichting:*	+	O	–

	Opmerkingen en/of suggesties

Appendix III: Overview Table Evaluation Checklist

Table AI-1: Overview of Questionnaire in Scenario-Based Testing

Category	*Source*	*No.*	*Statement (English)*	*Statement (Dutch)*
Objective	Based on Eysenbach (2000) and Van Gemert-Pijnen et al. (2011),	1	*In the project plan an objective is described, the results section reflects on this objective.* The objective was achieved	*In het projectplan staat een doelstelling van het project beschreven. In de resultaten wordt teruggekomen op deze doelstelling:* De doelstelling is bereikt.
Added Value	Lakerveld et al. (2013), Yusof,	2	The added value of the eHealth service was proven in regard to other services	De meerwaarde van de eHealth service is aangetoond ten opzichte van andere services.
	Papazafeiropoulou, Raul & Stergioulas (2008).	3	The eHealth service connects with other regional/national services	eHealth service sluit aan op andere regionale/nationale/internationale services
Feasability of implementation	Yusof, Papazafeiropoulou, Raul & Stergioulas (2008), Van Gemert-Pijnen et al (2011), Glasgow, Vogt & Boles (1999), Dansky, Sanner & Thompson (2006)	4	*An implementation strategy was used in the proces. An implementation strategy is a plan from idea to realization were different facets are described, such as the results, the direction, the design, the prototype testing and training.* The implementation strategy was worked out and tested.	*Een implementatiestrategie is een plan van het idee tot aan de realisatie waarin diverse facetten zoals het resultaat, de sturing, het ontwerp, het testen van het prototype en scholing worden meegenomen.* De implementatiestrategie is uitgewerkt en getest.
		5	*An overview of the number of working hours and corresponding costs was given (e.g. design by an external party). The results section described in which way the project has been realized in the number of hours.* The budget and/or hours were adequate for implementation	*In het projectplan is een overzicht gegeven van het aantal werkuren van personeel en de bijkomende kosten (bijv. extern ontwerp). In de resultatenomschrijving wordt omschrijven in hoeverre het project binnen dit tijdpad/aantal uren gerealiseerd is.* Het budget (incl. urenverdeling) voor implementatie is bijgehouden en valt binnen het tijdspad en het budget van het project .
		6	*Description of prerequisites which are necessary to carry out a project, such as: the availability of personnel, availability of IT and/ or research facilities. The organization described a realistic planning and organization of the implementation of the pilot.* The prerequisites are feasible and realizable	*Randvoorwaarden kunnen omschreven worden om een service verder te kunnen implementeren in dagelijkse praktijk. Denk hier aan de aanwezigheid van personeel, nodige computers en/of vakkennis. De organisatie gaat in op in hoeverre deze zaken gepland, voorbereid en realistisch uitvoerbaar zijn.* De randvoorwaarden en organisatie rondom uitrol van de service zijn haalbaar en uitvoerbaar.
		7	*An important aspect is to what extent this eHealth service is can be unfold. It means the degree in which the initial pilot could be implemented nationally.* Further implementation on national level is feasible	*Een belangrijk aspect is in hoeverre deze eHealth service op landelijk niveau uitrolbaar is. Dat betekent de mate waarin de initiële pilot service landelijk ingezet kan worden.* Verdere implementatie op een nationale niveau is haalbaar.

Measurement of effects	Based on interviews	8	Measurements of effects of the eHealth service are structured by means of validated instruments.	Effectmetingen van de eHealth service zijn gestructureerd door middel van gevalideerde meetinstrumenten.
Target Group	Based on Van Gemert-Pijnen et al. (2011), Pagliari (2007), Lakerveld et al. (2013), Yusof, Papazafeiropoulou, Raul & Stergioulas (2008), Glasgow, Vogt & Boles (1999) and the interviews	9	The eHealth services have the common goal to reach out to reach out for target groups which are hard to reach.	*De services gezamenlijk hebben als doel gesteld om meer moeilijk bereikbare doelgroepen te willen bereiken.*
			There is clear evidence that the intended and/or new target groups were reached with this eHealth service	Er is duidelijke bewijs dat de beoogde doelgroepen/of nieuwe doelgroepen wordt bereikt met deze eHealth service.
		10	There is a clear understanding of factors which improve/hinder reaching out to the target group	Er is inzicht in factoren die het bereiken van de doelgroep bevorderen/belemmeren.
		11	*A service is used by the target group. Use means that the target group adopts the service in their situation (for example, looking up a chat and ask questions, utilize given information). The frequency handles how often this is done (e.g. 3 chats a day, 800 visitors a month).*	*Een service wordt gebruikt door de doelgroep. Het gebruikt betekent dat de doelgroep de service in hun situatie toepast (bijv. opzoeken van een chat en hier vragen stellen, het benutten van gegeven informatie). De frequentie gaat in op hoe vaak dit gedaan wordt (bijv. 3 chats per dag, 800 bezoekers per maand).*
			The actual use including frequencies of use of a service is measured and compared with the expected use.	De daadwerkelijke gebruik inclusief frequentie van gebruik van een service is gemeten en vergeleken met het geplande gebruik.
		12	That target group sufficiently entangled in development and evaluation.	De doelgroep is voldoende betrokken geweest tijdens ontwikkeling en evaluatie.
		13	The service tunes up to the needs of the target group.	De service sluit aan op de behoeften van de doelgroep.
		14	A research on client satisfaction was conducted.	Er is een zorgvrager (klant) tevredenheidsonderzoek uitgevoerd.
		15	*The target group are often not without a reason at an online service. A service can give insight in reasons why the target group is using or not using that specific service.*	*De doelgroep komt in de meeste gevallen niet zonder reden bij een online service. Een service kan inzicht verwerven in de redenen waarom de doelgroep juist bij die service wel/niet komt.*
			There is a clear understanding of reasons why the target is, or is not using the service.	De service heeft zicht op de redenen waarom de doelgroep de service wel/niet gebruikt.
		16	Drop-out (the caretaker quits during the treatment) and the motives for non-compliance are mapped	Uitval (het afhaken van een zorgvrager gedurende de hupverlening) en motieven voor uitval zijn in kaart gebracht.
Caregivers perspective	Based on Van Gemert-Pijnen et al. (2011), Lakerveld et al. (2013), Pagliari (2007), Yusof, Papazafeiropoulou, Raul & Stergioulas (2008), Greenhalgh & Russel (2010) and the	17	The service meets the caregivers expectations	De service sluit aan op de behoeften van de hulpverleners.
		18	*The service meets the caregivers style of work*	De service sluit aan op de werkwijze van de hulpverleners.
		19	A summative evaluation was conducted with the caregivers	Er is een eindevaluatie uitgevoerd met de hulpverleners.
		20	A formative evaluation was conducted with the caregivers	Er is tussentijds geëvalueerd met de hulpverleners.
		21	Caregivers are trained to be able to use the eHealth service	Hulpverleners zijn getraind om gebruik te kunnen maken van deze eHealth service.
		22	A competence profile describes a function and the corresponding results, vital behaviors and competences explicitly and in a measurable way.	*Een competentieprofiel beschrijft een functie waarin te behalen resultaten, vereiste gedag en competenties expliciets en op toetsbare wijze omschreven zijn.*

	interviews			Er is sprake van een competentieprofiel voor de hulpverlener.
Quality of care	Based on Van Gemert-Pijnen et al. (2011), Pagliari (2007), Lakerveld et al. (2013), Yusof, Papazafeiropoulou (2008) and the interviews	23	Attention has been given to the a substantial discussion of cases trough supervision or discussions with colleagues.	Er is aandacht besteed aan het inhoudelijk bespreken van cases via intervisie en/of supervisie.
		24	Criteria are written down or guidelines were developed for references and risk-taxation.	Er zijn criteria opgesteld en/of richtlijnen ontwikkeld voor doorverwijzing en risico-inschatting.
		25	The service was automated/standardized if possible (think about standardized responses)	Waar mogelijk is de service geautomatiseerd/gestandaardiseerd (denk aan bijv. standaard responses)
		26	A social map embodies an overview of neighbor- and/or relevant services to where caregivers can refer	*Een sociale kaart bevat een overzicht van naburige en/of relevante services waar eventueel naar doorverwezen kan worden.* Er is een sociale kaart aanwezig voor doorverwijzing.
		27	*A secured online environment can be used to secure information safety when it comes about email or chat contacts.* The service was developed and functions in an secure (web) environment.	*Om de veiligheid van informatie te waarborgen wanneer er bijv. sprake is van email of chatcontact wordt er gebruik gemaakt van een beveiligde omgeving.* De service is ontwikkeld en functioneert binnen een beveiligde (web) omgeving.
		28	Client conversations are always guided by guidelines (e.g. protocols)	Gesprekken met zorgvragers lopen volgens gestandaardiseerde richtlijnen (bijv. protocollen).

About the Author

This master thesis is Ronald's graduation paper for his master of Health Sciences and the final endpoint of his double-degree education which he started in 2010 at the University of Twente. Last august he graduated for his master in Psychology on a paper about therapist treatment fidelity in a web-based alcohol treatment at Tactus Addiction Treatment in Enschede which eventually won the E-Hulp 'Online Support' thesisaward 2013 in January 2014.

Before starting his double-degree masters in 2010 he completed a Bachelor of Nursing, with an additional certificate for specializing in addiction treatment, at Windesheim, University of applied sciences in Zwolle. With more than 1.5 years of internship in several fields of health care (medium care cardiology, detoxification and diagnosis in addiction treatment, neuropsychiatry, geriatrics) he developed himself as a very broad basic Nurse. Since then, he worked several days a month at a psychiatric clinic to sustain his practical experience and to develop the on-the-floor aspect of working with the target groups. Since his graduation he works as a Psychologist at Mediant Mental Health Care and as a Teacher/Researcher at Saxion University of Applied Sciences.

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