eHealth in the preventive child health care

Empowering the ‘hard to reach’ parents in the preventive child health care via persuasive eHealth technology.

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Empowering the 'hard to reach' parents in the preventive child health care via persuasive eHealth technology

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Abstract

Background. With an increasing demand for child health promotion by the government and the preventive child health care in combination with the current financial strain on the preventive health care, greater efficiency is required. Providing health information through eHealth can be beneficial for achieving this goal. The preventive child health care organizations are not able to reach all the young people in the Netherlands, so some children have a decreased chance of growing up in a healthy and safe environment. Within the preventive child health care, the development and use of eHealth technologies is increasing. Previous research showed a positive attitude of parents towards the use of eHealth as a tool in the preventive child health care. When developing an eHealth technology, the co-operation between the developer and the user is important, to increase the reach of the technology. A lot of eHealth technologies are developed without involving end-users (patient, client, citizen) or health care professional.

> ***Objective.*** The research objective of this study is to define the wishes and needs of parents from the 'hard to reach' group towards eHealth and find the users requirements and persuasive elements for an eHealth technology in the preventive child health care.

Methods. This research is characterized by an explorative design and is focussed on qualitative data collection. In this study, the first two phases of the CeHRes roadmap are followed, namely the contextual inquiry and the value specification. By interviewing the child health professionals (N=5) and parents from the four 'hard to reach' groups (N=11) the wishes and needs are indicated. The needs, problems and values of the parents from the 'hard to reach' groups are translated into two Personas and two use-case scenarios .

Results. The parents that came to the child health professionals often wanted confirmation about the health and development of their child. Both the child health professionals and the parents from the 'hard to reach' group preferred an eHealth technology in the form of a website and/or mobile application, where they can login an find all the information about their child . Not possessing a DigiD account was mentioned by the child health professionals as the biggest barrier for the use of the current eHealth technology. Also the parents did mention some barriers in the use of the current eHealth technology, such as the language, DigiD and that it was not useful for children of every age. This should be improved, as well as the flexibility in appointments on short notice. Crucial requirements that the parents named for an eHealth technology were the possibility of different languages and the child health professionals had to explain the functionalities of an eHealth technology in the contact moments. Stimulating persuasive features for an eHealth technology were privacy, clear overview, easy to use and reliable information.

Conclusion. It can be concluded that most of the parents from the 'hard to reach' groups like to use a personalized eHealth technology where they can find information about their children and the possibilities to ask questions. For future research, the other three phases of the CeHRes Roadmap should be fulfilled.

Samenvatting

Achtergrond. Door een stijgende vraag vanuit de overheid en de jeugdgezondheidsinstellingen naar promotie en preventie in de jeugdgezondheid en door de huidige financiële druk op de algemene preventieve gezondheidszorg neemt de vraag naar het verbeteren van de efficiency hiervan toe. Het verstrekken van informatie over de gezondheid van kinderen door middel van eHealth zou hier een bijdrage aan kunnen leveren. De jeugdgezondheidszorg organisaties zijn niet in staat om alle jonge mensen in Nederland te bereiken. Hierdoor hebben sommige kinderen een verminderde kans om op te groeien in een gezonde en veilige omgeving. In de jeugdgezondheidszorg stijgt de ontwikkeling en het gebruik van eHealth technologie. Uit eerder onderzoek blijkt dat ouders positief tegenover eHealth staan als hulpmiddel in de jeugdgezondheidszorg. Bij het ontwikkelen van een eHealth technologie is de samenwerking tussen de ontwerper en gebruiker van belang om het bereik van de technologie te vergroten. De meeste eHealth technologieën zijn ontwikkeld zonder de eindgebruiker (patiënt, cliënt, inwoner) of zorgverlener hierbij te betrekken.

> ***Doel.*** Het doel van het onderzoek is het definiëren van de wensen en de behoeften van ouders uit moeilijk bereikbare groepen aan een eHealth technologie en het formuleren van de gebruikerseisen en 'persuasive features' voor een eHealth technologie in de jeugdgezondheidszorg.

Methode. Dit onderzoek is een explorerend onderzoek gericht op kwalitatieve data verzameling. De eerste twee fases van de 'CeHRes Roadmap', namelijk de 'Contextual inquiry' fase en de 'Value specification', worden in deze studie doorlopen. Door middel van interviews bij jeugdzorgverleners (N=5) en ouders uit de moeilijk bereikbare groepen(N=11), zijn de wensen en behoeften in kaart gebracht. Deze behoeften, problemen en waardes van de ouders uit de moeilijk bereikbare groepen zijn vertaald in twee 'Personas' en twee 'use-case scenario's'.

Resultaten. De meeste ouders, die naar de jeugdzorgverleners komen, zoeken bevestiging over de gezondheid en ontwikkeling van hun kind. Zowel de jeugdzorgverleners en de ouders uit de moeilijk bereikbare groepen geven de voorkeur aan een eHealth technologie in de vorm van een website en/of mobiele applicatie met inlogfunctie waar ze alle informatie over hun kind kunnen vinden. Het niet beschikken over een DigiD account werd door de jeugdzorgverleners als grootste barrière genoemd in het gebruik van de huidige eHealth technologie. Barrières die ouders noemen in het gebruik van de huidige eHealth technologie zijn, de taal, het inloggen met DigiD en dat het niet goed bruikbaar is voor alle leeftijden. Daarnaast opteren zij voor het inbouwen van meer flexibiliteit in het kunnen plannen van afspraken op korte termijn. Een eis die de ouders hebben aan de eHealth technologie is dat de informatie in diverse talen beschikbaar moet zijn. Voorts prefereren zij dat de jeugdzorgverleners de functies van de eHealth technologie in hun consulten nader toelichten. Ten aanzien van de stimulerende 'persuasive features' voor een eHealth technologie geven zijn aan te hechten aan privacy, duidelijkheid en overzichtelijkheid, makkelijk in gebruik en betrouwbare informatie.

Conclusie. Geconcludeerd kan worden dat de meeste ouders van de moeilijk bereikbare groepen graag een gepersonaliseerd eHealth technologie willen gebruiken, waar ze alle informatie over hun kind kunnen vinden en waar ze de mogelijkheid hebben om vragen te stellen. Voor vervolg onderzoek in de toekomst zouden de andere drie fases van 'CeHRes Roadmap' moeten worden doorlopen.

Preface

This paper is written to finish my master Health sciences at the University of Twente. During these six months I learned much about the preventive child health care. I accompanied different child health professionals, to watch their daily work activities. I found this period very interesting, because I got a good look at the insight of their work from which I learned a lot. Furthermore I would like to thank a number of people.

First I would like to thank all the child health professionals and parents who participated in this research. You were very friendly and helpful for this research. You took enough time for me and gave me new and interesting input for this research.

Next I would like to thank my supervisors from the University of Twente, Magda Boere-Boonekamp and Olga Kulyk. Both of you gave me enough space to develop myself, but always helped me with the feedback and the conversation we had.

Finally, I like to thank my supervisors from the GGD West-Brabant, Inge van Borne and Daphne de Lange. For helping me to find the child health professionals for the interviews. Every two weeks we had an evaluation meeting and both of you helped me with all your answers to my questions, and finding the right persons.

Deirdre van den Nieuwenhuizen

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1. Introduction

Reducing risks and improving benefits to the parents and children are requirements the health professionals are faced with in their daily work. Furthermore, cuts in health funds require an improved level of efficacy and efficiency within health care services. Adequate information and knowledge is required to meet this challenge and this is possible within an eHealth technology environment (Balas, Krishna, & Tessema, 2008). eHealth increased the effectiveness of health promotion effects and eHealth can provide information about several health topics (van Beelen, Beirens, den Hertog, van Beeck, & Raat, 2014). eHealth is defined as: 'the use of information and communication technologies, mainly internet technology, to improve or support the health or health care' (Timmer, 2011).
With an increasing demand for child health promotion by the government and the preventive child health care, and the current financial strain on the preventive health care, greater efficiency is required. Providing health information through the internet (eHealth), can be beneficial for achieving this aim (Bannink, et al., 2014). In the Netherlands the preventive child health care is public health care for children between 0 and 18 years old. The preventive child health care follows the physical, social, mental and cognitive development of children on individual and population level (Wieske, Nijnuis, Carmiggelt, Wagenaar-Fischer, & Boere-Boonekamp, 2011). The preventive child health care is important, because the identifies health problems in a timely manner so that children can get help in an early stage (Dunnink, 2010). Several contact moments are used to monitor the children. These contact moments are where the preventive child health care screens for health treats and disorders in the development of the children (Ministerie van VWS, 2015; Wieske et al, 2011;Verloove-Vanhorick, Verkerk, Leerdam, Reijneveld, & Hirasing, 2003).

The preventive child health care organisations is the only organisation within the health care sector which needs to reach all the children in the Netherlands (Diemen-Steenvoorde, 2014). These originations strive for 100% coverage of all their target groups. The preventive child health care currently has a reach of 95% for children under 4 years old and 90% for children above 4 years old. The preventive child health care organizations are not able to reach all the children in the Netherlands. Because of this, some children have a decreased chance of growing up in a healthy and safe environment. This is especially the case for children who grow up in a dysfunctional family (Dunnink, 2010). These parents and children are part of the so called 'hard to reach' groups. There are four main areas of importance on how to engage the 'hard to reach' groups, namely attitude of staff, service flexibility, working in partnership with other organisations and empowering users involvement (Flanagan & Hancock, 2010). It is the task of the preventive child health care organisations to reach all the children and especially the ones who are hard to reach. The Healthcare Inspection monitors the amount of children who are under reach of the preventive child health care (Diemen-Steenvoorde, 2014).

Within the preventive child health care the development and use of eHealth technologies is increasing (Pijpers, 2016). The child health professionals are using a digital file to record all the information about the child's health and development. The digital file is only visible for the physicians, nurse and an assistant of the preventive child health care (Nederlands Centrum Jeugdgezondheid , 2015).
When developing an eHealth technology, the cooperation between the developer and the user is important, to increase the reach of the technology (Voorham, Valstar, van der Poel, & Kocken, 2015). A lot of eHealth technologies are developed without involving end users (patient, client, citizen) or health care professionals (van Gemert-Pijnen, Peters, & Ossebaard, 2013). Without involving the end-users the implementations cannot find their way to the potential users (Voorham, Valstar, van der Poel, & Kocken, 2015). Important for developing an eHealth technology is the relationship with these users.

It is important to ask these users what their needs and wishes are in the preventive child health care, because they are the ones who have to work with the eHealth technology. They often know very well what they need and would like to have in an eHealth technology (Timmer, 2011).

1.1 Tasks of the preventive child health care

The task of the preventive child health care is to promote, signalise and monitor the health and safety of all children. The team of child health professionals exists of child health physicians, child health nurses and assistants. The basic program of the preventive child health care includes all the tasks of the preventive health child health care. These include monitoring the growth and development of the children, but also giving information, advice, instructions and guidance for a healthy development. Also the prevention of risks (primary prevention) and the early detection of risk factors that influence the functioning, development and health of a child (secondary prevention) (Dunnink & Lijs-Spek, 2008).

The National Immunisation Program, although not a part of the basic program, is an important activity of the preventive child health care. Every preventive child health care organisation is responsible for the fulfilment of their own tasks, but must comply with the guidelines of the basic program of the preventive child health care. The basic program is for every child the same, but the implementation depends on the specific situation of the child, family, environment and the needs of the parents and the children (NCJ, 2014).

The children have contact moments with health care professionals on a regular basis, but since 2015 the preventive child health care focuses on the specific circumstances of the child and adjusts the number of contact moments accordingly. Since 2015 the basic program of the preventive child health care has changed, with the aim to modernize more and connect more with the medical and societal developments. Examples of societal developments such as more assertive parents, changing attitudes towards health, the use of internet and the increase in overweight children. The timing of the regular contact moments will stay the same, but the content will be adjusted according to the new basic program. In the new basic program, the child health professionals are responsible, but the child and parents are consulted for every decision. All the collected data of a child must be saved in an online record (van Rijn, 2014).

Child health clinic 0-4
Children visit the child health clinic form birth until they are four years old. The basic program includes fifteen regular contact moments for children between zero and four years old. During the child health clinic visits, the parents can ask questions about the health and development of their child. The actions taken by the child health professional depend on the age of the child and the questions of the parents. Some examples of standard activities are measurement, weighing, vaccination and development surveillance (Van Wiechen screening tool). The child health professionals give information and advice about topics such as nutrition, behaviour, safety, dental care and raising your child. A contact moment can be face-to-face, by phone or group meeting. Depending on the age of the child, the parents will get an online questionnaire and the outcome will be discussed in the appointment with the child health care nurse (NCJ, 2014).

Preventive child health care 4-18
For all the children between four and eighteen years old there is also preventive child health care. There are five regular contact moments for children between four and eighteen years old, where the children's

growth, development and behaviour will be checked. Parents and children receive information about topics such as healthy lifestyle and biometrics. The children or their parents have to fill in a questionnaire about aspects of their life such as lifestyle, gaming and sexuality. Their answers determine if the child is invited for a consultation with the child health care professional. When the parents have questions about the health or development of their child, it is possible to make an appointment with the child health professionals. The preventive child health care organisations cooperate closely with the schools of the children (NCJ, 2014).

1.2 Hard to reach groups

The preventive child health care has a wide coverage, but not all the children are being observed. The definition of 'being observed' is that the preventive child health care organisation is aware of whether a child is receiving any care, either from the preventive child health care or from someone else. The coverage ratio is calculated by dividing the total number of children that are being observed by the total number of children living in the area of the preventive child health care (Dunnink, 2010).

In the Netherlands there are groups who are 'hard to reach'. The definition of these groups is: target groups that need to be communicated with, but the communication with these groups is extremely difficult or not possible to establish (van den Berg, van der Gun, Kierczak, van de Kooij, & Ineke, 2005). Possible reasons for the difficult communication are:

- It is not possible to find the target group; the preventive child health care organisations do not know where their 'location' is.
- Unable to interest people from the target group for information or projects.
- Using the wrong means of communication
- The group does not know that the organisation who tries to reach them sees them as a 'hard to reach' group (van den Berg, van der Gun, Kierczak, van de Kooij, & Ineke, 2005).

De Wilde et all. (2013) studied the how hard to reach group can be better reached. They concluded that the communication and expectations of the health care organisations are not sufficiently adjusted to the characteristics of the 'hard to reach' groups. That means that what the health care organisations have to offer to these 'hard to reach' groups hardly connects to their wishes and needs (de Wilde, van de Sande, Benning, Beijleveld, & Kocken, 2013).
It is possible to make a distinction between the 'hard to reach' groups. A part of the 'hard to reach' groups contains children who are registered at the municipality, but they are not present on their address of residence. This part contains children who move around a lot, e.g. Sinti and Roma families and children who are living on a temporary address. The other part of the 'hard to reach' groups are children who are not registered at the municipality. This part contains immigrants (From central and eastern Europe), asylum seekers and Antilleans enrolled in Curacao/Aruba (Heerwaarden & Pijpers, 2014).

In the Netherlands, 74% of the preventive child health care organisations do not observe all the children from the 'hard to reach' groups. Half of the organisations do not have the children of immigrants in observation and about two-fifths of the child health care organisation are missing the children from travellers (Diemen-Steenvoorde, 2014).

1.3 eHealth technology

eHealth is defined as:' *the use of information and communication technologies, mainly Internet technology, to improve or support the health or health care'* (Timmer, 2011). Example of an eHealth technology is the patient portal, those portal supports self-management of sickness, guidance on distance and implementation of self-care. The power of eHealth lies in the combination of monitoring and educational programs and/or feedback (Timmer, 2011). ePublic health is about prevention and education in the public sphere. Technology can be used for example population screening or monitoring population health. Also informing citizens and patients is possible, for example giving advice about life style (sexual behaviour, alcohol, drugs and food) and mobile applications about movements or food intake (van Gemert-Pijnen, Peters, & Ossebaard, 2013).

An eHealth technology can increase the quality of care, for example with a patient portal. Because of that portal it is possible for the patients to integrate the health care in their lives. The patients get more elbowroom and more control over their lives (Timmer, 2011). Also the use of online portals has benefits for healthcare providers. It is possible for them to improve the spread of the contact time of patients. Monitoring provides physicians, from distance, access to disease progression or the state of health of a patient. Because the patients themselves record information, the caregiver gets a fuller representation of the health of his patients. Patients, who come to a health care provider, often forget a large part of the relevant information which is given. When the patient notes data down at home in a monitor application and the application is also available for the health care provider, then it is possible to focus more on the request for help, then on data collection during a consultation. This reduces the administrative burden for the healthcare providers and the patient is able to remember more relevant information (Timmer, 2011).

It is clear that the effectiveness and the efficiency of eHealth technologies increase, when the reach increased. Despite the high use of internet in the Netherlands, there is still a 'Digital Divide'. This gap arises, because not all age groups and social groups in society have an easy access to the internet or can use this for social or health reasons. eHealth technology reaches the target group with a low social economics status (SES) not or less easy (Timmer, 2011). Also people from minority racial/ethnic groups, older age and poorer health have decreased access to internet (Kontos, Blake, Chou, & Prestin, 2012). With further development of eHealth extra attention to this target group is necessary, to ensure that they are reached and the potency of eHealth will be used (Timmer, 2011).

The adherence (actual use of system and content, related to intended use) to eHealth technologies to date is not so high. Therefore, it is important to increase the understanding about adherence in order to maximize the impact of eHealth technologies. It is important to know what kind of motivations and abilities the intended users have in order to realize their goals. Persuasive technologies focus on how technology can be created to motivate and enable users to realize their goals. Persuasive design techniques are used to modify the connect and format of an eHealth technology with regard to the users' motivation, ability to use technology and persuasion styles. The Persuasive System Design Model of Oinas-Kukkonen is developed to find out the requirements of the intended user for an eHealth technology (van Gemert-Pijnen, Peters, & Ossebaard, 2013).

1.3.1 Personalized eHealth portal

There are different eHealth technologies developed in the fields of consumer informatics and personal health informatics, one of them is the personalized health record (Mantas, et al., 2012). Personalized health records give the user access to personal, important private health information, knowledge and data (van Gemert-Pijnen, Peters, & Ossebaard, 2013) .

A personalized eHealth portal is used for enhancing health promotion and health protection, as well as quality, accessibility and efficiency. eHealth portals can enhance efficiency and bring added value to the health care by improving communication between the health care establishment and by widening access to health knowledge. An important goal of eHealth is that eHealth empowers health consumers: patients as well as healthy citizens. Both can benefit from better personal health education. An eHealth portal provides timely information tailored to individual's needs (Esposito, Seker-Guezel, Meier, & Guerro, 2007).

Important for a personalized eHealth portal is privacy, because eHealth information is probably the most personal and sensitive information that the user makes available in an electronic form. The trust of the user can only be achieved if they feel confident that their eHealth information is only made available to appropriate people in appropriate circumstances (Hine, Petersen, Pluke, & Sund, 2008).

There are some functional requirements for the users of an eHealth portal. Users of an eHealth portal should be able to create and save personalized pages with the specific content they would like to access. Users of the portal should have access to related services on a single page. Navigation elements should be provided, so that the users can easily switch to a different page when necessary. The portal should be easy to use. Users with a limited knowledge of computer technology should be able to use it (Lu, Hong, Liu, Wang, & Dssouli, 2008). Also the portal should be easy to understand for the users. The users should be able to understand the system, define a common clinical language that is understood by professionals and non-professionals (Esposito, Seker-Guezel, Meier, & Guerro, 2007).

1.3.2 Effective factors from current eHealth technologies

The research of Hopia et al. (2015) showed that the mobile phones as a tool are cost-effective and wide reaching, while easily targeting 'hard to reach' groups (Hopia, Punna, Laitinen, & Latvala, 2015). The use of Web-based applications for delivering tailored preventive message in the preventive child is also useful (Bannink, et al., 2014; Mangunkusumo R, 2007). In the research of Mangunkusumo et al. (2007) 1071 adolescents react positive on the use of internet in the preventive child health care. Especially the electronic health feedback was positively evaluated in this research.

Van Beelen et al. (2013) conducted a research about an eHealth technology for the child's safety at home in the preventive child health care (N=312). Less than half of the parents preferred an online questionnaire to receiving online tailored safety advice. The other parents preferred a face-to-face consultation. Despite the wide access to internet, most of the parents preferred to complete the questionnaire by using paper-and-pencil. Parents liked to receive online information about safety in combination with personal counselling (van Beelen, et al., 2013).
Personalized and tailored information combined with counselling can be provided by using an eHealth technology. Parents like to receive personalized information, because they find the information more useful than general information tools. The parents may also be more inclined to change their behaviour

when the received information is more relevant (van Beelen, Beirens, den Hertog, van Beeck, & Raat, 2014).

1.4 Research question

The research objective of this study is to acquire the needs and wishes of parents from the 'hard to reach' group and to define the users requirements and persuasive elements for an eHealth technology in the preventive child health care. To achieve the objective of this study, the following main research question is defined: *''What are the needs and wishes of the parents from the 'hard to reach' groups of children between 0 and 12 years old in regard to eHealth for preventive child health care?*''

The first sub-question is to identify the attitudes, experiences and attitudes of the child health professionals concerning the preventive child health care services and eHealth to the parents from the 'hard to reach' groups. The second question focusses on the attitudes, experiences and expectations of the parents from the 'hard to reach 'groups concerning the preventive child health care services and eHealth. The third question focuses on the values, requirements and persuasive features of the parents in the development and use of an eHealth technology. The following sub-questions are formulated draft:

1).What are the attitudes, experiences and expectations of child health care professionals concerning the current preventive health care services and eHealth technology to parents from the 'hard to reach' groups? (Contextual inquiry)

2) What are the attitudes, experiences and expectations of parents from the 'hard to reach' group concerning the current preventive child health care services and eHealth technology? (Contextual inquiry)

3). Which values, requirements (user, system, service) and persuasive features are important, according to the parents of the 'hard to reach' groups, in the development and use of an eHealth technology? (Value specification)

2. Theoretical Framework

In this chapter the CeHRes Roadmap for developing an eHealth technology is described. Furthermore, the framework for persuasive system design model is described to specify the user requirements.

2.1 CeHRes Roadmap: Holistic framework for eHealth development

To improve the implementation and effectivity of an eHealth technology, the CeHRes Roadmap is developed. To overcome the uptake and impacts barriers, an eHealth framework should address the needs of end users in order to realize the potential of technology to innovate healthcare. The values of stakeholders have to be taken into account to guarantee a successful implementation (van Gemert-Pijnen, Peters, & Ossebaard, 2013).

The CeHRes roadmap is a holistic framework and is focused on a good connection between people, technology and the context in which it is used. The roadmap functions as a guideline for the development process. The roadmap consists of five different components and connecting cycles to explore and test how an eHealth technology can be suited to the users and how the eHealth technology can be implemented in practice. The five phases are the contextual inquiry, value specification, design, operationalization and summative evaluation (figure 2) (van Gemert-Pijnen, Peters, & Ossebaard, 2013).

The first phase of the Roadmap is the contextual inquiry. In this phase, the design team must get an understanding of prospective users, their context and analyse the strong and weak points of the current provision of care. Tasks during the contextual inquiry are conducting a state-of-the art inquiry, identification of stakeholders (based on the problems/needs) and ideas about how technology could fulfil the needs of a stakeholder. The results are input for the second step namely value specification. Value specification provides information about the added value (economic, medical, social-psychological and organizational) a stakeholder attributes to the eHealth technology. These values, the needs and wishes of the prospective users need to be translated into functional, organizational and technical requirements. The third phase is designing, based on the requirements of the second phase. Fourth phase is operationalization, the technology is launched, marketing plans are set into motion, and organizational working procedures are put into practice. Finally, there is the summative evaluation. (van Velsen, van Gemert-Pijnen, Nijland, Beaujean, & Steenbergen, Personas: The linking pin in holistic design for eHealth, 2012)

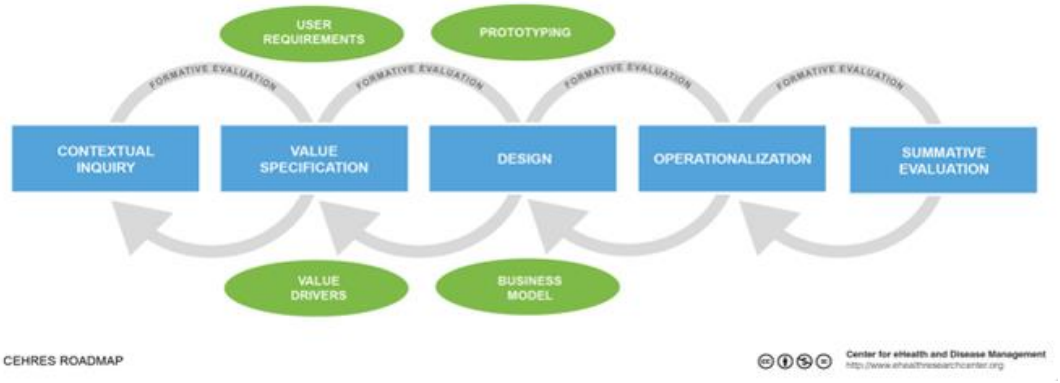

Figure 1 CeHRes Roadmap (van Gemert-Pijnen, Peters, & Ossebaard, 2013)

The eHealth framework is based on critical factors for the uptake and impact of eHealth technologies. These critical factors are translated into five principals, which form the basis of the holistic approach of the Roadmap. First, eHealth development is a participatory development, this means that all the stakeholders expectations and experiences have to be taken into account during the development and implementation of eHealth. This is also called co-creation, means development together with the end users instead of designing only for the end users. The second principal is that in the development of the eHealth technology an infrastructure for changing health and well-being is created. The first two principals are accountable for a bigger basis and common responsibility for the implementation of an eHealth technology. The third principal of eHealth development is that it is intertwined with implementation. Because of this reason it can prevent that the eHealth application is not used in practice, after the development process. The fourth principal of eHealth development is coupled with Persuasive design. Persuasive design is added to increase the adherence (actual use of system and content, related to intended use) and stimulate the end users, see paragraph 2.2. The last principal of eHealth development requires continuous evaluation cycles (formative and summative) (van Gemert-Pijnen, Peters, & Ossebaard, 2013).

An important aspect of the CeHRes Roadmap is that the needs, expectations, interests and motivations of the prospective users are taken as the focal point of design and are valuated throughout the development. This is called human-centered design (van Gemert-Pijnen, Peters, & Ossebaard, 2013). Personas could be used as a method of communication. Personas are a collection of realistic representative information of the end users which can include fictitious details for a more accurate characterization (van Velsen, van Gemert-Pijnen, Nijland, Beaujean, & Steenbergen, 2012).

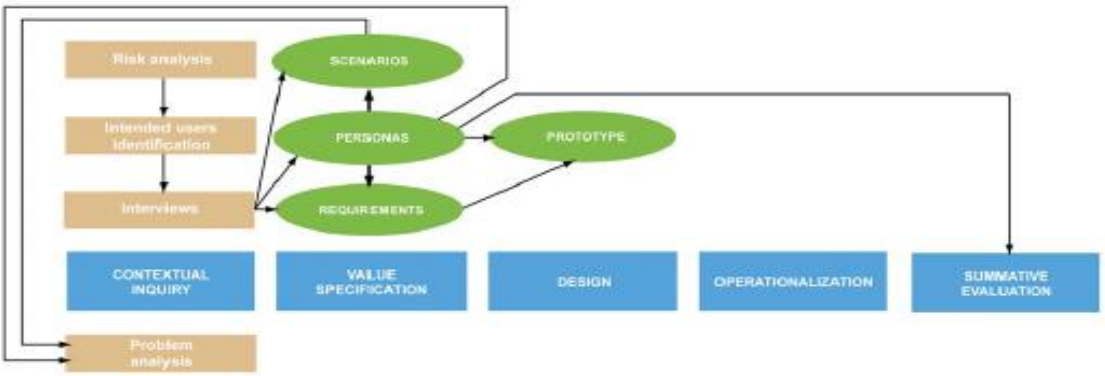

Figure 2 Personas in the CeHRes Roadmap (van Velsen et al,2012)

2.2 The Persuasive System Design Model

The persuasive design model of Oinas-Kukkonen describes the persuasive system as: computerized software or information system designed to reinforce, change or shape attitudes or both without using coercion or deception (van Gemert-Pijnen, Peters, & Ossebaard, 2013). The persuasive design model is designed to develop and evaluate persuasive systems (Oinas-Kukkonen & Harjumaa, 2009).

Requirements specification is one of the most important phases in developing a software. Requirements are descriptions of how the system should behave, these are the functional requirements. The qualities the system must have; these are the non-functional requirements. And constraints on the design and development processes (Oinas-Kukkonen & Harjumaa, 2009).

PERSUASIVE DESIGN FEATURES			
PRIMARY TASK SUPPORT	**DIALOGUE SUPPORT**	**CREDIBILITY SUPPORT**	**SOCIAL SUPPORT**
Reduction	*Praise*	*Trustworthiness*	*Social learning*
Tunneling	*Rewards*	*Expertise*	*Social comparison*
Tailoring	*Reminders*	*Surface credibility*	*Normative influence*
Personalization	*Suggestion*	*Real world feel*	*Social facilitation*
Self-monitoring	*Similarity*	*Authority*	*Cooperation*
Simulation	*Liking*	*Third party endorsements*	*Competition*
Rehearsal	*Social role*	*Verifiability*	*Recognition*

Figure 3 Persuasive design features Oinas-Kukkonen (Oinas-Kukkonen & Harjumaa, 2009).

There are four categories for persuasive system principles, namely primary task, dialogue, credibility and social support (see figure 3).

- The first principle is primary task support; this support consists of carrying out the users' primary task. *'Reduction'* helps to reduce complex behaviour into simple tasks. *'Tunnelling'* guides the user through a process or experience. *'Tailoring'* means the information is tailored to the potential needs, interests, personality of the user group. *'Personalization'* means that personalized content or services has a greater capability for persuasion (Oinas-Kukkonen & Harjumaa, 2009).

- The second principle is dialogue support; this helps the user achieve his/her goal. Through '*reminders'* the user will be reminded of his/her behaviour. *'Suggestions'* means the system will give fitting suggestions to the user. *'Liking'* is a system who is visually attractive for the user and in a *'similarity'* system, the user can identify themselves (Oinas-Kukkonen & Harjumaa, 2009).

- The third principle is credibility support, this describes how to design a system that is credible and thus more persuasive. This category consists of *'trustworthiness*' of the system, 'real-world feel', this mean that the system should show people/organization behind the content or services. *'Authority'* should refer to people in the role of authority (Oinas-Kukkonen & Harjumaa, 2009).

- The last principle, social support, contains the social-interaction elements. *'Social learning'* is that the user will be more motivated to perform, where they can use a system to observe others performing. *'Cooperation'* can motivate the user to adopt a target attitude by leveraging human beings natural drive to co-operate. At least offering public *'recognition'* for the user (Oinas-Kukkonen & Harjumaa, 2009).

3 Method

This research is characterized by an explorative design and is focussed on qualitative data collection. Qualitative research is applied where quantification is either not useful for answering or (temporarily) impossible. Data collection in this qualitative research study is carried out through interviews by stakeholders. Qualitative research is a good method to get more information about the background, the vision, the argumentation and the consideration of patients and care givers in health care (Holloway & Wheeler, 2010).

In this study, the CeHRes Roadmap is applied to develop and/or improve the eHealth technology. The CeHRes roadmap is a research approach for human centered design and development. This means that the development team must involve the end-users and stakeholders throughout the whole design process (van Gemert-Pijnen, Peters, & Ossebaard, 2013). In this study, the first two phases of the CeHRes roadmap are followed namely the contextual inquiry and the value specification. Table 1, gives an overview which method is used to answer the research questions in de different phases of the CeHRes Roadmap.

Table 1 Overview of the research questions and methods per research phases.

Phases CeHRes Roadmap	**Research question**	**Methods**	**Study population**
Contextual Inquiry	What are the attitudes, experiences and expectations of child health care professionals concerning the current preventive health care services and eHealth technology to parents from the 'hard to reach' groups?	Semi-structured interviews	Child health care professionals (n=5)
	What are the attitudes, experiences and expectations of parents from the 'hard to reach' group concerning the current preventive child health care services and eHealth technology?	Structured and semi-structured interviews	Parents from the 'hard to reach' groups (n=11)
Value specification	Which values, requirements (user, system, service) and persuasive features are important, according to the parents of the 'hard to reach' groups, in the development and use of an eHealth technology?	Translating interview data to Personas, use-case scenario, value, persuasive features and requirements	

3.1 Contextual inquiry

The contextual inquiry phase was aimed at identifying and describing the stakeholders (parents and child health professionals) needs and problems (van Gemert-Pijnen, Peters, & Ossebaard, 2013). The experiences, attitudes and expectations towards the preventive child health care and eHealth technology were needed to fulfil the contextual inquiry. What were the needs and problems of the parents from the 'hard to reach' groups and child health professionals, which regulations and conditions should be taken into account and how can eHealth technology support parents and child health professionals? To get this information for the contextual inquiry phases, semi-structured interviews were conducted with parents from the 'hard to reach' groups and child health professionals.

3.1.1 Setting and target group

The research was conducted at the department of preventive child health care at the municipal health service (GGD) of West-Brabant. In West-Brabant there are more than 85 thousand children between 0 and 11 years old (GGD West-Brabant, 2015). In 2015, the preventive child health care of West-Brabant provides care at the child health clinic around 12.500 babies and toddlers and 32.300 children between 4-19 (GGD West-Brabant, 2016). Since 2015, child health clinics in some of the municipalities in West-Brabant moved from Thebe (home care organisation) to the municipal health service (GGD) West-Brabant. This way the GGD West-Brabant monitors the children from birth until their 18th birthday (GGD West-Brabant, 2015).

Since 2014, within the preventive child health care, an eHealth portal has been available for all the parents in West-Brabant with children between 0 and 18 years, called 'Mijn kind in beeld' (MKIB). This portal is an initiative of the GGD West-Brabant and home care organisation Careyn (GGD West-Brabant, 2014). The GGD West-Brabant prefers to make all the information that is collected by them visible for all the parents. In this portal, the parents can find all the information about growth, development and behaviour of their child, which is completed by the child health professionals. Another function of the portal is making and changing appointments. As a result, there are less parents that do not show up for an appointment, because they can schedule and change appointments by them self. The portal also contains an advice module where it is possible to get 24/7 advice from a professional. Duo to this, parents are no longer tied to the opening hours of the GGD (Jacobs, 2015).

In 2016, the GGD West-Brabant is still developing eHealth technologies based on the wishes and needs of the parents. They aim to tailor an eHealth technology as closely as possible to every parent. They want more connection with a personalized eHealth portal for the 'hard to reach' groups (van der Zijden & Poppe-de Looff, 2015). This thesis focussed on permanent camping residents, families with a low social economic status (SES), immigrants and skippers. These were the four groups who were the most difficult to reach in West-Brabant (Heerwaarden & Pijpers, 2014).

Permanent camping residents

Camping residents are people who are either permanently or temporarily living on a recreational residence as a main residence (de Boer, Kabos, Boekelo, Zwaag, & Feringa, 2006). In 2015, 277 children from 0 till 19 years old were living on a recreational residence in West-Brabant; this is 0.2% of all the children in West-Brabant. Zundert is the municipality in West-Brabant with the most children from permanent camping residents. There are two recreation residences in the municipality Zundert, namely Ford Oranje and Patersven (GGD West-Brabant, 2015).

In 2014, the GGD West-Brabant was part of an enforcement action of the municipality Zundert, at camping ford Oranje in Rijsbergen. The preventive child health professionals investigated if there were problems in the personal life situations and in the living environment of the camping residents. During this action in 2014, the child health care professionals saw a lot of children on the camping who were not observed by the preventive child health care. The living conditions of the residents were often terrible and their lives problematic. Estimates suggested that 85% of all the residents of camping Ford Oranje live below the poverty line. The recreation residents in West-Brabant contained a lot of immigrants, especially from Middle and East-Europe (Beers, Iersel, & Steiner, 2014). These people come to the Netherlands to work and often do not enrol in the municipality. This is the reason this group is 'hard to reach' for the preventive health child care (Heerwaarden & Pijpers, 2014). Also some Dutch residents on the camping do not enrol in the municipality, because they cannot afford an identity card.

Since the enforcement action, the care for vulnerable parents and children on the camping stays high on the agenda of the GGD (Beers, Iersel, & Steiner, 2014)

Low Socioeconomic Status

The socioeconomic status (SES) of a family is determined by education, job (social position) and income of the parents. A child automatically gets the status level of his/her parents. The SES of a family influences the expectations that the environment and society have, with regard to the development and availability of a child from that family. Children from low SES families have an increased risk of stress experience, for example by financial problems, overcrowding, unemployment. This can affect the psychosocial development of children (Luttmer, 2006). Of all adults in West-Brabant, 5% has a low education (no education or only primary education). 22% of the adults say they have struggles to make ends meet (Regionaal Kompas Volksgezondheid West-Brabant, 2014).

People with less income and lower education do not use health services in the same way as wealthier and higher educated people do. A Canadian study found that lower SES Canadians used primary care more frequently but, when adjusted for health care need, were less likely to get specialty care (Adler & Newman, 2002). A low SES also affects health behaviours. Lower SES is associated with increased rates of cigarette smoking and more sedentary lifestyle (Chen, Matthews, & Boyce, 2002). Low SES is associated with behavioural problems by children. Behavioural problems affect the children's opportunities to learn, because these children often are punished for their behaviour and might develop conflictual relationships with teachers. Children could get a negative attitude towards school and therefore have less academic success (Dubow, Boxer, & Huesmann, 2009).

In 2014, 1,3 million people in The Netherlands between 16 and 65 years have low literacy. Between 1994 and 2012 the number of illiterate people increased with 200.000. In Brabant (West, Central, South-East) 10,1 % of people have low literacy. The largest group of low literacy people (540.00 people) consists of older natives, who have received secondary vocational training. The second largest group consists of people who are not working and have a low level of education. This group consists of 120.000 natives and 108.000 immigrants (Buisman & Houtkoop, 2014). A study into the relation of health and illiteracy showed, that the people with low literacy had less knowledge about disease management and healthy lifestyle (Zarrinkhameh, 2015). eHealth seems accessible for people who have low literacy, when they use simple language and illustrations for clarification (den Hoed, 2015).

Immigrants

An Immigrant is a person who is born abroad or of whom at least one of the parents was born abroad (CBS, 2016). In 2014 in West-Brabant 7% of the total population were Western-Immigrants and 9% were Non-Western immigrants (GGD West-Brabant, 2015). In 2015, most immigrants of the first and second generation in West-Brabant were from Morocco, Turkey, Belgium, Germany, Indonesia and Poland (Centraal bureau voor de Statistiek, 2015).

The biggest part of the 'hard to reach' group of immigrants consists of families in situations where they are deprived from society. Characteristics of these families are parents with a low literacy, not enough knowledge of the Dutch language and/or a low level of education. In addition, parents often experience cultural differences in the way of communication. Most of the time they have another view on raising children and there is a lack of knowledge about education and development of their children in the Dutch society (de Wilde, van de Sande, Benning, Beijleveld, & Kocken, 2013).

Children of immigrant families often have speech and language problems. This is related to their foreign language or bilingual upbringing, but also to the under stimulation of speech and language development

by parents. Parents who are immigrants talk less with their children and do not often read to their children (Luttmer, 2006).

The GGD Amsterdam did a research to the parents with children between 0-4 years, who do not show up to appointments (10%). The research was focussed on the background of the parents and the reason why they do not show up. A remarkable result of this research was that immigrant children do not show up more often when compared to children of native parents (de Wilde, van de Sande, Benning, Beijleveld, & Kocken, 2013).

Skippers

Skippers are 'hard to reach', because they travel a lot for their work. Skippers often have a postal and email address, phone number and the children are often signed in the municipality basic administration. But still they are 'hard to reach', because parents have to travel far to come to the child health clinic visit of the preventive child health care (Heerwaarden & Pijpers, 2014) .

Children between zero and four years old travel together with the parents on their ship (Heerwaarden & Pijpers, 2014). Children can stay on the ship until their 7th birthday, when they follow special education for skippers' children. In academic year 2015-2016, 234 children between 3.5 and 7 years old, received education on board. After the 7th birthday, the children could go to a regular school or to an institution for skippers children (LOVK, 2015).

3.1.2 Participants

Child health professionals

Five professionals of the preventive health care were interviewed to get more information about the 'hard to reach' groups they work with and the (current) eHealth technology. This group consisted of one child health physician, two nurse practitioners preventive care and two child health nurses. These professionals work with children in the age of 0-4 and 4-12 years. They work on different locations in different municipalities of West-Brabant and they all worked with parents and children from the 'hard to reach' group. The interviews were more focussed on the child health nurses and nurse practitioners preventive care than physicians, because they had more contact with families. The health child nurse and nurse practitioners preventive care had more intensive contact with parent and child, especially in families with a lot of problems, where they often went on home visit. Also with every new-born, the child health nurse and nurse practitioners preventive care goes on a home visit (van Bijsterveldt, 2010). For this research the GGD West-Brabant has released the names of the professionals on different locations who are working with parents and children from the 'hard to reach' groups. Through a personal telephone call the professionals were approached for an interview.

Parents from the 'hard to reach 'groups.

The study population consists of parents who live permanently on a camping, families with a low social economic status (SES), immigrants and skippers. Through the child health professionals, that were interviewed, the parents who came to their appointment or were visited at home were asked for an interview. The parent had the interview directly after their appointment with the health child professional, or another time at the GGD location or at the home of the parent. Eleven parents from different 'hard to reach' groups were interviewed. The interviews took between 30 and 45 minutes each.

Important inclusion criteria had to be taken into account by selecting parents for an interview. The criteria were: parents who come from the four 'hard to reach groups', speak Dutch or English and have

at least one child between zero and twelve years old and living in West-Brabant. For the diversity of the study population it was important to have different ethnicity, age and number of children.

3.1.3 Data collection

To carry out the contextual inquiry, interviews were done with child health professionals and parents from the 'hard to reach groups'.

Interviews child health professionals
First the child health care professionals were interviewed, to find out their attitudes, experiences and expectations concerning current preventive child health care services and eHealth to the parents of the 'hard to reach' groups. The interviews were done in a semi-structured way, because semi-structured interviews are useful for finding out 'why' rather than 'how many/much'. The flexibility of the semi-structured interview makes it easier to answer the 'why' question and better understanding of the resource question (Miles & Gilbert, 2005). The interview started with three general questions, what is their function, how long are they working at the child health clinic or municipal health service and what their work activities are on a day. After that they were asked to the 'hard to reach groups', where the child health professionals work with. To get more information about the 'hard to reach' groups and the care they receive. In the last part, the interviews were focussed on eHealth technology. In the interview the MKIB of the GGD West-Brabant, was used as an example for a personalized eHealth portal. To understand what child health professionals think of eHealth. What there experiences were with the current personalized eHealth portal and what kind of expectations they had for an eHealth technology. It was allowed for the child health professionals to give suggestions how they want certain things in the preventive child health care. In appendix 1, is the guideline for the interviews with the child health professionals. Because of the semi-structured method, it was possible to interrogate on the questions of the interview.

Interviews parents from the 'hard to reach' group
Eleven parents from the four 'hard to reach' groups were interviewed. The interviews were both structured and semi-structured. Some questions were in a structured way, because the parents could choose for different options. Some questions were in a semi-structured way, to understand better why parents wanted something. The first part of the interview was a questionnaire focused on the demographic background. In the demographic background, questions were asked on ethnicity, education, access to internet and social media. This was important to ask, because the parents need internet and a computer/mobile phone to use an eHealth technology. Background information of the parents was necessary to understand better the wishes and needs of the end-users. This information was important for the contextual inquiry phase of the CeHRes Roadmap and necessary for the persona and the use-case scenario. The second part of the interview was focussed on the current well-child visits of the preventive child health care. The third part of the interview was focussed on information provision of the preventive child health care. The fourth part of the interview was focussed on the parents needs of an personalized online portal. This was asked to know if parents from 'hard to reach' exactly wanted an online portal. The last part of the interview was focussed on the personalized eHealth portal, in this research the 'mijn kind in beeld' portal was showed as an example. First the parents were asked if they are familiar with the MKIB portal. Independent what the answer of the parent was, the portal was shown on a laptop. The parents could better answer the questions of the interview if they know how the MKIB portal looks like and what the functions are. After showing the portal different questions were asked to parents of each of the three groups, namely for parents who are familiar and use the portal, for parents

who are familiar but do not use the portal and for parents who are not familiar and use the portal. By asking all this topics the contextual and value specification phase was fulfilled. In appendix 2 is the guideline for the interviews with the 'hard to reach' parents.

3.1.4 Data analysis

The interviews of the child health professionals and parents were transcribed verbally to be able to make an analysis. It was important to make a detailed interview transcript of the answers of the respondents, especially for semi-structured interviews, otherwise important information might be missed (Plochg, Juttman, Klazinga, & Mackenbach, 2007). The six steps of Plochg et al. (2007) were used to analyse the qualitative data of the interviews. These consist of 1) ordering and making it readable for the analysis, 2) obtaining a global overview, 3) making a detailed analysis, 4) deepening of the analysis, 5) searching for a meaningful presentation and 6) interpretation of the analysis as a whole.

The software program Atlas.ti was used for the analysis to make the process of analysing more systematic, ordered, transparent and accessible (Plochg, Juttman, Klazinga, & Mackenbach, 2007).

Interviews with the child health professionals
Transcribing the interviews yields a general overview of the results of the interviews. In the third step of Plochg et al. (2007) the obtained data were coded and organised. First the data were coded with five main codes, namely 1) background information, 2) work experience with the 'hard to reach' parents, 3) attitude towards eHealth technologies, 4) experiences with the current eHealth technology and 5) expectations of eHealth. The next step of the coding process was open coding. New and more practice related codes were created for each of the five main codes (Appendix 3 gives an overview of all the used codes) and the interview answers were verified in the context of the research question. The last two steps contained an interpretation of the total data of all the interviews of the child health professionals in the light of the research question. The peculiar data were lined out in the different paragraphs.

Interviews with the parents from the 'hard to reach groups'
The same steps of Plochg et al. were followed for analysing the data from the parents from the 'hard to reach group'. Only the main codes are different, namely 1) background information, 2) the experiences and expectation of the current preventive child health care, 3) attitude towards eHealth technologies, 4) the experiences with the current eHealth technology and 5) the expectations of an eHealth technology. In the last two steps, were the data are interpreted with respect to research question, connections and comparisons are also made between the different 'hard to reach' groups (Boeije, 2002). In this last step important questions were answered such as:

- What does group 1 say about certain themes and what do the other groups (2,3,4) say about the same themes?
- Which themes appear in one group, but not in the other groups?
- Why do groups view issues similarly or differently? (Boeije, 2002)

3.1 Value specification

The second phase in this research was the value specification. In this phase the interview data from the 'hard to reach' parents and child health professionals were translated in the values, requirements and persuasive features for an eHealth technology.

3.2.1 Requirements and persuasive feature analysis

Based on the results of the interviews with parents from the 'hard to reach' groups values, requirements and persuasive features regarding an eHealth technology was established. Users expressions were translated into requirements or persuasive features, when it captures something important in relation the aims of the technology.

Value was an ideal or interest an end-user aspires to or has. Attribute was a summary of the need or wish that is spoken out by the end-user. Attributes and values could be translate into user-friendly and feasible functionalities. A requirement was a technical translation of an attribute (Van Velsen, Wentzel, & Van Gemert-Pijnen, 2012). There were different types of requirements , namely *functional and modality requirements*. This mean specifying technical features and on what kind of technology (tablet, desktop PC, smartphone) and operating systems the technology should work. *Service requirements* is specifying how services surrounding the technology, like marketing or user support, need to be organized. *Organizational requirements*, specifying how the technology should be integrated in the organizational structure and working routines. *Content requirements*, specifying the content that needs to be communicated via the technology and language, level, persuasive approach and special accessibility demands. The last requirement is *usability and user experience*. This mean specifying the interface and interaction design of a the technology and how user experience factors, as trust or fun, should be integrated into the technology (Van Velsen, Wentzel, & Van Gemert-Pijnen, 2012).

The persuasive features were classified in: *primary task support, dialogue support, system credibility support* and *social support* (Oinas-Kukkonen & Harjumaa, 2009). Those classified persuasive features were subdivided in stimulating and blocking features. Stimulating features have positive influence on motivating the user, perceived usefulness and adherence. The blocking features have negative influence on motivating the user, perceived usefulness and adherence (Kulyk, op den Akker, Klaassen, & van Gemert-Pijnen, 2014).

The translation of the raw data into requirements was based on the requirements development approach of van Velsen et. Al (2013). Within this approach thee derivatives were determined, namely values, attributes and requirements. This approach entails a systematic approach and forces to identify requirements and in an empirical manner.

3.2.2 Personas and Use-case scenarios

After translating the interview data into requirements and persuasive features, Personas and use-case scenarios were created of the parents from the 'hard to reach' groups. Personas are abstract representations of distinctive user groups for the technology (Pruitt & Grudin, 2003). Personas could play an important role, because they can serve as inspiration for functional design and interface and interaction design. The development of Personas was based on a risk analysis to determine the most important user groups for the new eHealth technology (van Velsen et al, 2012). In order to develop Personas, the results from the interviews with parents from the 'hard to reach' groups were used. The first step in the development of the Personas was to determine the primary users groups. The second step was to create the Personas. According to LeRouge et al. (2013), relevant information was write down in two tables (one for each Persona) in which is listed relevant interview segments and quotes from the interviews and this was translated into the Persona (LeRouge, Ma, Sneha, & Tolle, 2013). The following classifications were used, demographic, health specifics and technology specifics. In appendix 5 and 6 the overview of translated results are shown. Each sentence in the Persona description corresponds to finding from the interviews (van Velsen, van Gemert-Pijnen, Nijland, Beaujean, & Steenbergen, Personas: The linking pin in holistic design for eHealth, 2012).
Use-case scenarios were different scenarios about daily situations in which the technology could be used. The scenarios could be useful tools during user evaluations, because the users can better imagine the use situation and contexts of the new or existing technology (Carroll, 2000). The scenarios were based on the needs and problems of the parents in the preventive child health care. (Pommeranz, Brinkman, Pascal, Broekens, & Jonker, 2009).

3.2 Ethical approval

The research proposal and interview for the parent was approved by the ethical commission of the University of Twente. The research must meet certain ethical standards namely, voluntary cooperation, right information, anonymity and absence of adverse effects (Baarda, et al., 2013). All participants of the interviews were informed in advance about the aim of the interview. Prior to the interview, the participant received a brief explanation before the interview. When the interview starts there was once again a small brief explanation and the parent has to sign. After that there was asked if it was possible to record the interview. When the participant has questions it was possible to ask them before and after the interview. The interviews were anonymous and the recordings were removed after work out the interview. For the parent it was possible to receive the results of the research by mail.

4 Results

In this chapter, the results of the interviews with the child health professionals and parents are presented. Based on the interviews of the parents, two Personas and use-case scenarios are created and the requirements and persuasive features are presented in the value specification.

4.1 Contextual inquiry

4.1.1 Child health professionals

The two child health nurses, two nurse practitioners preventive care and the child health physician in this research worked at four different locations in West-Brabant, Werkendam, Oosterhout, Rijsbergen/Zundert and Breda. Two of the child health professionals work with children between four and eighteen years old and three of them work with children between zero and four years old. Their average work experience as a child health professional was more than 15 years.

The work experience with families from the 'hard to reach' groups

Most of the child health professionals experienced the contact with the parents from the 'hard to reach' groups as positive *''I think it is a nice group to work with, because I have the feeling that I really can achieve health gains''*. Despite the positive experience, the child health professionals still encountered some issues in the communication with the parents from the 'hard to reach' group. Table 2 gives an overview of the problems with those parents. The biggest problem they encountered was getting and staying in contact with the parents from the 'hard to reach' groups. Also the communication was experienced as difficult due to the language barrier and there were some parents who move often, because they cannot find work or live on a temporary address.

Table 2 Problems of child health professionals during communication with those parents.

Problems	Example citation
Difficult to get and stay in contact	''it takes a lot of effort and time to get in touch…. I bring the invitation letter for an appointment in person, otherwise there is a chance that they lose the letter or don't understand what to do '' (N=3)
Language barrier	''we have parents and children who do not understand the questionnaires and require help'' (N=2)
Move often	''Some people, also in AZC, move often'' (N=2)
No money to visit the child health professionals	''they have to walk with their child from the camping to the child health clinic, because there is no car, bike or money for the bus'' (N=1)

Most of the child health professionals tried to reach the children by contacting the school. When the children were younger, the child health professionals tried to visit their home address to get in contact. Once the contact was made, the majority of the child health professionals noted that they have more contact with those children than with the regular children ''… *for an extra check if they grow well and also to have contact with the parents again''*. Also the service deviated for the children from the 'hard to reach' groups, according to the child health professionals: *''... 'hard to reach' are also fragile… so you put more time in reaching them.''* and *''More easily I give away my email address or phone number''*.

The parents that came to the child health professionals with their children often wanted confirmation: *''Most parents want often confirmation, if they do it right''*. Especially, the parents with young children like to get that confirmation. According to the child health professionals, most of the questions of the parents were about nutrition, behaviour and sleeping.

In the interviews the child health professionals made some suggestions for the future. For the future, the child health professionals preferred face-to-face communication in combination with other means of communication: *''... some groups need more time and explanations and that works better when you see them in real life''*. Table 3 gives an overview of the advantages and disadvantages of different means of communication with the parents from the 'hard to reach' groups. Most of the child health professionals preferred e-mail in combination with face-to-face communication.

Table 3 Advantages and disadvantages of different means of communication of those groups

Means of communication	**Example citation**
Email	Positive: ''Mail works definitely'' (N=3)
	Negative: '' You cannot email them..'' (N=1)
WhatsApp	Positive: '' WhatsApp works best for upcoming single mothers or low SES" (N=2)
	Negative: '' I cannot always answer directly'' (N=1)
Phone call	Positive: '' A digital office hours for phone call is nice'' (N=2)
	Negative: '' because of language problems it is difficult to call them'' (N=2)
SMS	Positive: '' Texting high school students works very well, because they do not pick up phone calls or reply to emails'' (N=1)
	Negative: ''SMS cost money… a lot of them have call credits and that is used up already'' (N=1)
Video call	Positive: '' For skippers it is perfect, when they have questions and for example video call me'' (N=1)
	Negative: ''Parents prefer calling instead of video calling when they have questions'' (N=1)
Group meeting	Positive: '' I have a lot of parents, with children age 6/7, who have questions about eating….. group meetings for those kind of subjects would be helpful'' (N=1)
	Negative: ''.. because Polish and Romanian do not understand Dutch and also not always English, so they do not come'' (N=1)

Attitude towards eHealth technology

The child health professionals had different attitudes towards eHealth technology. Some of the child health professionals saw some difficulties with a digitalized society: *''...I think our society is too digitalized. People forget that the system is only a guideline. In this way when something is wrong, they assume there's something wrong with the system instead of looking what a person really needs''*. The attitude towards digital contact moments was also not always positive: *''Sometimes, when the parents stand up to leave after an appointment, they might remember another question they wanted to ask and come back or take a quick seat to ask it. This is not possible in a digital contact moment, because then*

they have to make a new call'. Two other child health professionals thought digitalizing the contact moments gave more opportunities in the preventive child health care: *''A digital waiting room is helpful for phone calls''.* The most important reason the child health professionals mentioned that parents from the 'hard to reach' group will not use eHealth technologies because it was not directly necessary for them. This is especially the case for people who just arrived in the Netherlands. *''This isn't your first priority when you just arrive in the Netherlands''.* For the child health professionals it was important that the society is not too digitalized, but they did saw some opportunities in the use of eHealth in the preventive child health care. Two child health professionals indicated that eHealth technology will only work if the technology works properly and does not contain any annoying flaws.

Experience with the current eHealth technology

The child health professionals had different experiences with the current eHealth technology, 'mijn kind in beeld'. All of them were familiar with the current eHealth technology. Three of the child health professionals saw the MKIB portal once or twice , while the other two have not seen it at all: *''I am familiar with it, but I cannot see it, because I do not have access to it''.*

Two child health professionals did not promote the MKIB portal to parents from the 'hard to reach' groups :*''It already takes a lot of effort to explain who I am and what I am doing, to save myself some energy I skip the explanation of the MKIB''.* The other three that did promote the portal, promote it on their own ways. Two of the child health professionals promoted the portal during the consults: *''I tell the parents there is a portal where they can find information''.* Two of them promoted the portal by showing the link on the letter the parents received, and two child health professionals used the flyer to promote the portal: *''... at home visits when a child is born, I explicitly hand out the flyer and I explain it''.*

Two out of five child health professionals noticed that some parents used the portal: *''not often, but there are some parents who look at the length and weight curve'', ''I think they only use it once in a while to change an appointment''.* The other three professionals assumed that the parents from the 'hard to reach' groups did not use the portal. According to the child health professionals, there were different bottlenecks in the use of the MKIB portal for those parents. Table 4 shows that most of the child health professionals assumed that the parents from the 'hard to reach' group did not have a DigiD account. The language barrier was also a problem in the use of the MKIB portal, according to most of the child health professionals.

Table 4 Bottlenecks in the use of the MKIB portal for parents from the 'hard to reach groups'.

Bottleneck	**Example citation**
Not possessing a DigiD account	'' DigiD is not your first priority, when you come to the Netherlands'' (N=3)
Language barrier	'' They don't understand the letter and I cannot explain them in English what the portal is…… my English is not so good'' (N=3)
Too complicated to use	''.For the disadvantaged families and immigrants, it is too complicated, because of the amount of steps they need to take'' (N=1)
No access to a laptop/internet	'' Looked at it in practical terms, not everyone has a computer or internet'' (N=1)

Table 5 gives an overview of the recommended improvements for the current eHealth technology, according to the child health professionals. Most of them suggested that the portal should be available in more languages. Other improvements they suggested were the general information about the preventive child health and the appointment function of the portal.

Table 5 Recommended improvements for the MKIB portal for parents from the 'hard to reach' groups.

Improvements	Example citation
Availability of different languages	'' .. and in different languages would be better, namely Arabic, English, French and Eastern European languages'' (N=4)
General information about the preventive child health care	'' when you can go to the preventive child health care and which phone numbers you can contact'' (N=2)
Appointments	''changing an appointment is very useful, but it is not working well and parents don't have a lot of choices'' (N=2)
Specific Advise (Advies op Maat) targeted to older children	'' The specific advise function is more focussed on the young children, the answers should be changed in more useful answers for older children'' (N=1)
Nutrition advice	'' …what Dutch children eat, and for example an image of the food pyramid on the portal'' (N=1)
Information about vaccination	'' ..which vaccination Dutch children get'' (N=1)
Registration of advice in the portal	'' …if I register my advice in the MKIB portal, the parents and I need to log in, which makes it safer…when the parent asked me something about sleeping.., but forgot the answer, he or she will be able to read back my answers'' (N=1)
Visibility of the record	'' for skippers it is nice to see the record online when they are unable to come to their own child health clinic" (N=1)

Expectations of eHealth technology

All the child health professionals liked to present an eHealth technology in a website and/or a mobile application where the parents could login and find all their information. Table 6 gives an overview of the requirements that the child health professionals thought that was necessary for an eHealth technology. Most of the child health professionals thought that privacy was important for the new and the current eHealth technology. Also the accessibility of the portal was an important requirement for two of the child health professionals.

Table 6 eHealth requirements, according to child health professionals**.**

Requirements	Example citation
Privacy	'' Privacy is very important, I currently give a lot of advice by email, but this is not very secure. If it is possible to send advice in the MKIB portal it will be harder for other people to access the information, which gives you more privacy". (N=4)
Accessibility	'' … that you do not need hundred passwords'' (N=2)
SMS reminder function	'' a reminder function, like sending a text message, works well for an appointment'' (N=1)
Reliable information	'' Reliable information is necessary'' (N=1)
Easy to use	'' .. clear and understandable, also for people with other nationalities (N=1)

4.1.2 Parents from the hard to reach group

In this research, eleven mothers from the 'hard to reach' groups were interviewed. Table 7 shows an overview of the demographic data from the parents from those groups. The age of the parents who were interviewed was between 22 and 42 years old (M=31.1 SD=5.4). They had, on average, two children and the average age of the children was seven years. All the parents who were interviewed had access to a laptop, mobile phone and sometimes also a tablet. All the parents had access to internet at home and to their DigiD account. Eight parents used internet every day and three of them used internet once a week. Six of the parents had a non-Dutch nationality and all of them had problems with reading and writing Dutch.

Table 7 Overview demographic data from parents from the 'hard to reach' groups

Age mother (year)	Number of children	Age children (year)	Group	Country of origin	Location	Level of education	Relation	Job	Non-Dutch speaking
26	1	8 mnth	Camping Residents Immigrant	PL	Rijsbergen	University (PL)	x		x
36	2	6 14	Camping Residents Low SES	NL	Rijsbergen	MAVO			
33	4	2 8 12 16	Camping resident Immigrants	PL	Wernhout	High School			x
29	2	1 5 9	Skippers	NL	Werkendan	MAVO	x	x	
42	4	4 mnth 7 13 17	Skippers	NL	Werkendam	MAVO	x	x	
30	1	4 mnth	Immigrant	PL	Made	HBO (PL)	x	x	x
25	1	3.5 mnth	Skippers	NL	Werkendam	MBO	x	x	
2	1	2 mnth	Immigrants Low SES	AO	Zundert	MAVO			x
30	3	7 mnth 3 5	Immigrants Low SES	MA	Oosterhout	High school	x		x
34	2	10 mnth 2	Low SES	NL	Wernhout	MBO	x	x	
35	4	2 5 11 12	Immigrants	CD	Breda	High School			x
							7/11	5/11	5/11
± 31.1	± 2.3	± 6.7							

Experience and expectations about the current preventive child health care

In general, the parents were positive about the current preventive child health care. Only three of them had negative experiences with the current care. The negative experience was caused by the late diagnosis of the child health professional*: ''... there was something wrong with his eye, but the child health nurse did not believe me. But when I went to the family doctor, he noticed there was something wrong with the eye''*. The parents were also positive about the information and advices of the child health professionals. Only two respondents thought that the information and advices were not so useful for them, because one of them thinks that she is knowing more than the child health nurse. None of the parents missed something during the appointments with the child health professionals. All the parents indicated there was enough time for them during appointments, they can ask everything that they want and everything that will happen during the appointment is clear for the parents.

In general, the parents asked their questions about the health and development of their child to the child health professionals. Six parents like to search on the internet when they have questions. Two parents were detached about the use of internet for health problems by their child: *'' There are too many websites and different information on the websites, so I do not know what is right or wrong''.* Some parents asked for information with their family, friends or the teacher of the children, when they had questions.

Most of the questions the parents had about their children, concerned nutrition and sleeping. Most parents like to have confirmation of the health and development of their child: *''about his size, what is normal for his age?''*. Especially the parents with their first child looked for confirmation. The parents with more children would like to have extra tips and information about the health and/or development of their child.

The parents gave some suggestions for the contact between them and the child health professionals. Every parent preferred to have face-to-face contact with the child health professionals. Especially parents with another nationality, because they were able to explain themselves better in a direct contact. Most of the parents suggested to have the possibility of mail and telephone contact with the child health professionals, because it is fast and easy. None of the parents preferred video calling. In Table 8 shows an overview of all the suggestions the parents from the 'hard to reach' group made.

Table 8 Suggested contact method of parents with the child health professionals

Method of communication	**Example citation**
Mail	Positive: '' I think mail is fast and easy for a question'' (N=5) Negative: '' I do not use mail'' (N=1)
Phone call	Positive:'' Phone call is just easy and fast to ask a question'' (N=4) Negative:'' I do not have quick question for a phone call or something like that. And when I call, I know she has not enough time for me'' (N=2)
WhatsApp	Positive:'' In the beginning I used WhatsApp to ask questions. That was easy '' (N=1) Negative: 'WhatsApp.. too difficult for me'' (N=2)
Video call	Negative: ''Video calling is so impersonal, I am not going do that'' (N=2)

Parents also had some recommendations for making and changing appointments. Nine of the parents liked to call when then want to change or make an appointment. Two skipper mothers preferred to call,

but the accessibility of the child health clinic was in their opinion very bad. Other methods that the parents preferred were the possibility to make and change appointments by email, visiting the location and a website. One of the parents suggested that the child health clinic had too many options to contact them for making an appointment or ask a question: ‘ *’There should be only one way that works well and will viewed by the child health professionals’’.*

When the parents wanted to have extra information about the health and/or development of their child, the parents preferred to use different information tools to get this information, see table 9. Most of the parents suggested an extra appointment with the child health professionals. The parents also proposed to email and/or phone call with the child health professional to collect extra information. Two parents were interested in group meetings, but two other parents were very reticent towards group meetings: *‘’ I do not see the added value of that’’.*

Table 9 Suggestions of parents from the 'hard to reach' group for different information tools

Information tools	Example citation
Appointment	‘’For me it is better to have an extra appointment, because I cannot speak Dutch an my English is also not perfect. For me it is easier to understand the conversation when it is face-to-face’’ (N=7)
Email	‘’It is just easy and I don’t have to leave the ship’’ (N=5)
Phone call	‘’ I like to call the child health nurse when I cannot find the information on internet’’ (N=5)
Groups meeting	‘’ If he is nine months old and three or four other mothers have children of the same age, it will be nice to talk with them and be able to ask questions’’ (N=2)
YouTube video	‘’ I like YouTube, because there you can see how things are done’’ (N=1)

Attitude towards an eHealth technology

Most of the interviewed parents were in favour of an eHealth technology where they could find the weight and the height curve of their child. Only two of the parents thought that it is sufficient when they could view the curves during an appointment with the child health professional. Table 10 shows the advantages of this information in an eHealth technology, according to the parents. Most of the parents would like to have access to the curves at home, so their partner had also the possibility to see it. Two parents said that it would be a duplication when the curve was shown in both the child development book (groeiboekje) and online. They indicated that one way of presenting the curve is enough for them and that it does not matter which way.

Table 10 Overview of advantages to have an eHealth technology were parents can find the growth and height curve

Advantages	Example citation
Show partner and/or family at home	‘’ I can show my family and husband, because he is always working, so I can show this at home’’ (N=5)
The curve is automatically displayed	‘’ There is a graph in the health development book, but it is not filled in. I like to see the curve filled in’’ (N=2)
Show other health care professionals	‘’It is good when I go back to Poland for holidays or maybe back for living. When I have problems with my daughter and I am in Poland, I can show

	the doctor this information. Now and then I use the book, but sometimes I forget the book. So it is better to see this online'' (N=2)
Confirmation	'' .because than I am more sure, if he is growing good or he is not to skin'' (N=2)

Most of the parents were positive towards an eHealth technology in which they could ask for advice and find information. Seven of them would like to have this opportunity for quick questions*'' That is not a bad idea, because than I don't have to email my child health nurse every time''.* Four of the parents were against this possibility , because if they had questions or need advice, they would like to ask the question in person to the child health professionals. One of them said: *''I do not use a computer very often, only for cooking video's. I do not understand it, because my Dutch is not so good''.*

The opinions towards an eHealth technology in which the parents can find the total health record of their child were divided. The skipper mothers could imagine that it is very useful for some skippers when they went to different child health clinics in the Netherlands, but the skipper mothers in this research always went to the same child health clinic location. One of them suggested that the option should be available for all the parents, but that they were able to choose whether or not they want to see the total health record. Mothers with another nationality preferred to have access to the total health record, because when they visited their home country they could show this record to other child health professionals. Some other parents would like to see it, because they want to know everything about the health and development of their child: *''In such conversation I don't hear everything, because I am also sitting there with my child. So I like to read everything again at home''.* Two parents did not want to see the total health dosser of their child in an eHealth technology, because they were fine with the way it currently works.

Experience with the current eHealth technology

The 'mijn kind in beeld' (MKIB) portal is used as an eHealth technology by the GGD West-Brabant. This portal is used as an example in the interviews for an eHealth technology in the preventive child health care. Five out of eleven parents knew about the MKIB portal, but only one parent had actually visited the portal. The six remaining parents were not familiar with the portal. All of them would like to get to know the portal if the child health professionals would give some more information and explained the portal.

In general, the first impression of the MKIB portal of the parents was positive. They thought the portal looked nice and clear. Only one parent would not use the portal after she saw it: *''I never use my computer. I am not good with it and I do not understand what everything means. I cannot read Dutch very well''.* Most of the parents saw advantages in the use of the portal for short questions about their child, when they wanted to change or make an appointment and to see the growth and the height curves. Three of the eleven parents would like to use the portal, because they thought the information in the portal was reliable to use: ''*... on google you get so many different outcomes that I often do not know. A website from the GGD looks more reliable for me to use''*. Table 11 gives an overview of all the advantages and disadvantages parents named per function of the portal. Most of the parents liked to see the growth, length curve and the *van Wiechen* overview. Nobody named disadvantages in that specific function of the portal. Four mothers also named advantages in the functions specific advise and appointments. Especially parents with one child like to use the specific advise function of the current eHealth technology.

Table 11 Advantages and disadvantages per function of the MKIB portal, according those parents.

Functions	Advantages	Disadvantages
Growth, length curve and van Wiechen overview	Accessible at home (N=5) '' .. I can show the curves at home to my husband''	
	Confirmation (N=1) '' I like to see the growth graph, how big she is and if she grows normal''	
Make or change online appointments	Accessibility (N=4) '' they are hard to reach by phone, but now I can do it by myself online''	Not enough options to choose (N=2) '' In this system it can be full, but in reality there is sometimes still a place available. If I email the child health nurse she always creates a place for me''
	Possible to make a notice (N=1) '' When you make an appointment, it is handy that you can make a note by the appointment. Most of the time I already know some questions, but I often forget them when I'm there. So now it is easy to write down your questions''	
Specific advise (Advies op Maat)	Fast and easy (N=4) '' you get an answer fast about the most common problems by children ''	Not useful for older children (N=1) '' The answers are not so useful for the older children''
		Answer too general (N=1) '' As answer you get a general rule''
Questionnaires	Easier to fill in online (N=2) '' Questionnaires on the computer are good, my oldest daughter is very good with computers so she is able to fill them in by herself''	
Contact form	All the functions in one system (N=1) ''You are already working with your child to find information, so I don't mind to send an email from that program''	Too much steps (N=2) '' If I have a question I will email the child health nurse directly and I do not want to log in a portal first''

Table 12 gives an overview of the barriers that the parents noticed for using the portal. Only two mothers did not have access to DigiD, these are mothers with another nationality. The other nine mothers had no problem logging in with DigiD and thought that it is a safe way to login. The language was also a barrier for the mothers with another nationality, because the portal was only in Dutch. Two mothers with older children noticed that the portal was not useful for all ages.

Table 12 Overview of barriers the parents see to use the MKIB portal

Barriers	**Example citation**
Language	‘’.. the language, it is only in Dutch and that makes it too difficult for me’’ (N=4)
DigiD	‘’ I cannot log in with my DigiD and I don’t know what the problem is’’ (N=2)
Not useful for every age	‘’….. I will not use this for my oldest son. I don’t see an occasion to use this portal for my oldest son’’ (N=2)
No reason to visit the portal	‘’ I don’t see a reason the look in the portal, when I don’t need to change an appointment’’ (N=1)
Computer	‘’ I don’t use a computer for this kind of things’’ ((N=1)
Too many different ways to ask questions	‘’ There are too many different ways to make contact, but I like to have one good way, than so many options to ask a question (N=1)

After they saw the portal, the parents gave some suggestions for the improvement of the MKIB portal. Table 13 gives an overview of these recommendations, according to the parents from the ‘hard to reach’ group. Three mothers liked to see the portal in different languages, otherwise it was difficult for them to understand. Two skipper mothers liked to see more flexibility in the appointments, but one of the them thought it was hard to improve the appointments function for them, because they did not always know when they are ashore. Nowadays, they make a call and the child health nurse creates time for an appointment, sometimes even in their own break. This was not possible with the appointment function of the MKIB portal.

Table 13 Improvements of the MKIB portal, according to the parents from the 'hard to reach' group

Improvement	Example citation
Available in more Languages	'' The language, I can only read English, so that is better for me'' (N=4)
Flexibility appointments	'' system should be more flexible with our work circumstances, because we cannot plan everything so far ahead'' (N=2)
More information focussed on older children	'' that you see by different ages, different subjects, what is relevant for that age'' (N=2)
Vaccination	'' I would like to see an overview of all the vaccinations he gets with a time schedule when he gets them'' (N=1)
Contact with other parents	'' I like to have contact with other parents, so maybe I can ask questions to other parents'' (N=1)
More personal	'' Should be more personal, especially the advises are to general'' (N=1)
All the information from the development book in the portal	'' When the development book will disappear it should be nice, if you can fill in the pages of the development book online. So I like to have all the personal things you can fill in the book, also in the portal to fill in'' (N=1)
Save and print the data from the portal	'' When the child is older and you want to show them all their curves when they were young. It will be nice if you could save that or print it to show them in the future'' (N=1)
News page	'' Sometimes the government make some changes and we don't know everything about it. We like to know what is happening or changing'' (N=1)
All the data visible	'' ' I like to see the things see what the health child care nurse or physician write down about my son's health….. Because than I can check at home on internet, when I have more questions about it. When things are serious she discover, I like to see it in a system like this'' (N=1)

Expectations of an eHealth technology

All the parents still preferred to visit the child health professionals for important questions and for the regular contact moments, but for extra information parents liked to use a website and/or a mobile application. Especially the parents with their first child preferred a mobile application. Only two parents still preferred to visit the child health professionals for extra information:'' *Not a computer, if I need information the child health nurse should explain me"* . Table 14 gives an overview of the preferences for an eHealth technology.

Table 14 The preferences of the parents for an eHealth technology platform

eHealth technology	Example citation
Website	'' I like to get information by a website, because than you take the time for it'' (N=7)
Mobile application	'' I think I like an application, because you can see it easily on your tablet on the couch'' (N=3)
YouTube video's	'' And maybe a Youtube channel with short videos about playing with children and information about eating'' (N=1)

The requirements of the parents set to an eHealth technology were worked out in paragraph 5.2, the value specification.

4.2 Value specification

4.2.1 The requirements to an eHealth technology, according to the parents

Various requirements concerning the eHealth technology have been identified based on the results from the interviews with the parents from the 'hard to reach' groups. The most important requirements were classified within the following categories of Van Velsen et. all (2013): functional requirements, service requirements and content requirements. Table 15 gives an overview of all main common requirements, according to the parents from the 'hard to reach' group. The most common functional requirement was an eHealth technology offered as website and mobile application. The service requirement was that the child health professionals had the possibility to explain the functionality of an eHealth technology in their contact moments. The most common content requirements was an eHealth technology offered in different languages.

Table 15 Overview of the most common values and requirements, according to those parents.

Citation	Value*	Attribute*	Requirement*	Requirements function
''To start with a website, but maybe an application for the mobile phone is also good'' (N=9)	Access to the information of your child online	Mobile application and website	eHealth technology in a website and mobile application to find information about your child	Functional
''The child health nurse should explain me about something like this'' (N=6)	Knowledge about all the functionalities in an eHealth technology	Personal contact	Support of the child health professionals to explain the functionalities of an eHealth technology in the contact moments	Service
''For better understanding, it is good that a system is in different languages'' (N=3)	Support for all languages in the Netherlands	Accessible in different languages	eHealth technology offered in different languages	Content
'' .. one program where you can find all the information of your child'' (N=2)	Easy access to the information of your child	All the information at one location	One portal to access the information of your child	Functional
''I will not use this portal for my older children, because the subjects and curves are not so important at that age'' (N=2)	To extend the information to the entire childhood period	One portal for all the information needed during the childhood	eHealth technology should not only be focussed on the youngest children, but should be extended to the entire childhood	Content
''That they get a message, that we try to make an appointment on Monday but because it is full next weeks….. they contact us for other possibilities to come'' (N=2)	To take into consideration the specific demands of subgroups	Possibilities of making appointments on short notice	Special possibilities in the eHealth technology, to make appointments on short notice for specific target groups.	Content
'' I cannot log in with my Digi D and I don't know what the problem is'' (N=2)	Instructions how to login	DigiD is not known for all the potential users	Instruction how to login with DigiD in the eHealth technology.	Functional

*Value: An ideal or interest an end-user aspires to or has.

**Attribute*:* a summary of the need or wish that is spoken out by the (future) end-user.

***Requirements: technical translation of an attribute.

4.2.2 Personas

Four different 'hard to reach' groups were interviewed during this interview. The interview results made it clear that there were two primary end-users. The first group consists of parents that have one child and the second group consists of parents with more children. The two personas were based on the answers the two different primary end-users named in the interviews. Appendix 5 and 6 contains a description for each persona with the interview segments, sample quotes and translation to a persona. The persona got a name and a picture to make it more real. The first persona corresponded with the answers of four participants and the second persona corresponded with the answers of seven participants. Persona one, Roza Stanislawa, is the mother of one child (figure 3) and persona two Carola Veldkamp is the mother with more children (figure 4).

Name: Roza Stanislawa
Gender: Female
Age: 25
Number of children: 1 (4 months)
Resident: Zundert
Education level: Low educated
Job: No
Marital status: In a relationship

'' This is my first child, I do not know everything yet''

Roza contacts the child health professional for answers when she has questions about her child. Besides the child health professionals, she asks her mother when she has questions and otherwise searches on the internet to find the answers. Because this is her first child, she has a lot of questions and desperately wants confirmation about if she is doing it right.

Roza has access to a mobile phone, laptop and tablet with internet. She uses the IPad more than ten times a day. Roza is going to use the current eHealth technology for changing appointments or when she has questions about eating and sleeping. She likes to have a mobile application as eHealth technology, because she thinks it fast, easy and accessible everywhere. For Roza, important eHealth requirements are reliable information, being able to understand the technology and support for different languages.

Figure 3 Persona 1, Roza Stanislawa

Persona one is about Roza Stanislawa. Roza is the mother of her first child, but she still has a lot of uncertainties about the health and development of her child. She thinks an eHealth technology can help her with those uncertainties. She would like to see the growth and length curve of her child at home, because she will be able to show this to her husband.

Name: Carola Veldkamp
Gender: Female
Age: 34
Number of children: 3 (8 months, 4, 6)
Resident: Werkendam
Education level: Low educated
Job: Yes
Marital status: Married

'' I want extra information for all my children''

When Carola has questions about her youngest child, she contacts the child health professionals. When she has question for her two older children, she asks their teacher. This is her third child, so she already knows a lot about children and the most common problems. Still, Carola likes to get extra information about enuresis of her older son.

Carola has access to a mobile phone, laptop and tablet. For her work she uses internet for mailing. She will use an eHealth technology when she has questions or wants extra information and for making or changing appointment. Carola likes to use a website to get information about her child. For Carola, important eHealth requirements are privacy and a clear overview of all the information. She does not like it when everybody is able to access the information about her child and she does not want to search for hours to find the correct information.

Figure 4 Persona 2, Carola Veldkamp

The second persona is Carola Veldkamp. Carola is the mother of three children, so she has more knowledge about the health and development of her child. She would like to use an eHealth technology for finding extra tips and for making and changing appointments.

4.2.3 Use-case scenarios

Two use-case scenarios were developed to make it easy to understand how the future eHealth technology will be used in daily context. The first use-case scenario is about Carola, who needs tips or information for her oldest son of six. The second use-case scenario is about Roza who visits Poland with her son.

Use-case scenario 1: ' Carola need information for her oldest son'

Last night, the oldest son of Carola peed for the third time that week in his bed. Carola would like to have extra information or tips how she can help her son to solve this problem. Her son does not want to visit a health professional, because he is too ashamed. Carola can login to the personalized portal of the GGD to find a solution for her sons' problem. The personalized portal is secured, so not everybody is able to see it. She navigates to specific advise and the subject enuresis. She fills in the questions and gets an advice on what to do. The advice also contains a list of organisations, people and/ or websites who you can contact to get more information. She finds a forum with mothers who have the same problem with their child.

Use-case scenario 2: 'Roza visit Poland with her son'

Roza goes to Poland with her child for six weeks this summer. She would like to show the growth and length curve to her mother in Poland. She wants to print the curves, because in her home country the internet is not always working. By login in the personalized portal and navigating to the growth and length curve, she is able to print them. Her son was sick when she was in Poland, so she went to the family doctor there. She was able to login in the personalized portal and show the family doctor all the information the child health professionals wrote down about her son. Roza can switch the portal to her own language, so Roza and the family doctor can understand what the child health professional wrote about her child.

4.2.4 Persuasive features to an eHealth technology

The persuasive system design model of Oinios-Kukkonnen and Harjumaa (2007) was used to categorise the requirements for an eHealth technology, according to the parents from the 'hard to reach' groups. Several crucial persuasive features were identified and categorized into 1) stimulating features and 2) blocking features.
Table 16 gives an overview of these stimulating persuasive features. Privacy and a clear overview of information were the most common mentioned requirements. Parents like to have privacy in an eHealth technology, so that not everybody could see the data of their child.

Table 16 Overview of stimulating persuasive features

Requirements eHealth technology	Persuasive system design category and function	Example citation
Privacy	Credibility Support '' surface credibility''	'' I think it is important when I will use something like this, that not everybody can see all the information about my child'' (N=4)
Clear overview of information	Primary task support '' tunnelling''	'' I think it is important that something like this is clear and understandable'' (N=4)
Easy to use	Primary task support ''tunnelling''	'' I think it is important to find the information fast. So that you don't have to look for so long before you can find the information you need'' (N=3)
Reliable information	Credibility support '' Trustworthiness'' '' Third party endorsements''	'' The information should always be up-to-date, because it is more safe to use than'' (N=3)
Personalized	Primary task support '' personalization''	''…personalizing, for example when I log in that they welcome me'' (N=2)
Contact with other parents	Social support '' Social comparison''	'' I like to have contact with other parents, so maybe I can ask questions to other parents'' (N=1)

Table 17 gives an overview of blocking persuasive features that the parents from the 'hard to reach' group mentioned during the interviews. Four parents mentioned the language, because when the eHealth technology was only in Dutch they were unable to understand and use the technology.

Table 17 Overview of blocking persuasive features.

Blocking requirements	**Persuasive system design category and function**	**Example citation**
Language	Primary task support ‘’tunnelling’’	‘’ for better understanding it is better that the website is in more languages’’ (N=4)
Use of a computer	Primary task support ‘’ reduction’’	*‘’ Not a computer, if I need information the child health nurse should explain me’’ (N=1)*

5. Discussion

In this chapter, the summary of the main results is presented. Then the results of the interviews are comprised with the literature. The limitations of this research are presented and some practical recommendations are done. Finally, the conclusion of this is research is presented.

5.1 Main results

The main question of this research was: ‘’What are the wishes and needs of the parents from the ‘hard to reach’ groups of children between 0 and 12 years old in regard to eHealth for preventive child health care?’’ To answer this question, three sub questions were answered first. In the different sections below the answers to these sub questions are lined out.

5.1.1 Attitude, experience and expectations of the child health care professionals

Overall, the five interviewed child health professionals experienced working with the parents from the ‘hard to reach’ group as positive, but there is still room for improvement in the communication with those parents. The most common reason that was mentioned is that it is difficult to get and stay in contact with the parents. Possible explanations were, but were not limited to, the fact that the parents had no money for transport, move often and the language barrier. Most of the child health professionals liked to use e-mail, WhatsApp and phone calls to communicate with these groups. With the reason that e-mail and WhatsApp were free to use for the parents and most of those groups did not have a lot financial resources. The child health professionals had different attitudes toward an eHealth technology. Some of them saw difficulties with a digitalized society, because they were afraid eHealth technologies were becoming to integrated in the preventive child health care. Supporting more languages was mentioned most often as an improvement in the current eHealth technology of the GGD West-Brabant. Not possessing a DigiD account was mentioned as the biggest barrier for the use of the MKIB portal. Most of the child health professionals noticed that the parents, especially from the ‘hard to reach’ group, were not familiar with the portal. The reason for that is that most of the child health professionals did not promote the portal to these groups. All the child health professionals liked to present an eHealth technology in a website and/or a mobile application where the parents could log in and find all their information. The child health professionals thought that when designing an eHealth technology, it was important for parents to had enough privacy and that the eHealth technology was easily accessible.

5.1.2 Attitudes, experiences and expectations of parents from the ‘hard to reach’

In general, the eleven interviewed parents are positive about the current preventive child health care. Most of the parents like having face-to-face contact with the child health professionals, especially when they need extra information about their children. A large majority of the parents are in favour of an eHealth where they can find the growth and length curve of their child online, as well as general advice for raising their child. Most of the parents where not familiar with the current eHealth technology, because it was not enough promoted, but after seeing the portal most of them like to use it. Most of the parents were positive in this portal about the appointment function and the growth and length curves. They did mention some barriers in the use of the current eHealth technology, such as the language, DigiD and that it was not useful for children of every age. This should be improved, as well as the flexibility in appointments on short notice. Most of the parents like to have a website as eHealth

technology, or in combination with a mobile application, where they can find information about their child.

5.1.3 Values, requirements (user, system, service) and persuasive features, according to the parents

The parents from the 'hard to reach' groups named three crucial requirements for an eHealth technology. Firstly, there should be a website and mobile application where they can find all the information about their child. Secondly, the child health professionals should explain the functionalities of an eHealth technology in the contact moments. Finally, an eHealth technology should be offered in different languages, otherwise some immigrant parents are unable to understand and use it.

The parents also named four crucial persuasive features for an eHealth technology. The first one is privacy as stimulating persuasive feature. The privacy of the parents and children is very important, because not everybody should be able to see their personal data. The second feature is a clear overview of the information in an eHealth technology. The third feature is that the eHealth technology should be easy to use, according to the parents from the 'hard to reach' group, otherwise they will not use it. At last, the eHealth technology should offer reliable information.

5.2 Comparison of the results with the literature

The child health professionals noticed that it takes a lot of time for some of the parents from the 'hard to reach' group to really trust the child health nurse. This was confirmed by the literature, where they concluded that the strong relationship of confidence with this group of parents was important, but it takes a lot of time to establish (van den Berg, van der Gun, Kierczak, van de Kooij, & Ineke, 2005).
The GGD Midden-Nederland did a research on which questions most parents with children between zero and one-year-old had. The results were the same as in this research, where most of the questions from these parents were about nutrition (de Vos & Feenstra, 2013). Also the information source for parents with younger children was the same as in the research of the GGD Midden-Nederland. Besides the child health professionals, the parents liked to use internet and ask their family or friends if they had questions about their child (de Vos & Feenstra, 2013).

In this research child health professional mentioned transport as a barrier to go to the child health clinic. They lived to far from the clinic and they did not have the tools or the money to travel. Also the research of Flanagan&Hancock (2010), reported that transport was a barrier to go to different health clinics.

The research of Heerwaarden and Pijpers (2014), reported that an interactive personal record could be helpful for the skipper parents, so that they always had access to the personal record of their child. In this research, the skipper parents always went to the same child health clinic. Therefor the interactive personal record was not applicable for them. For example, two of them had children at the boarding school in the same place as the child health clinic. For them it was not necessary to have an interactive personal health record of their child, but they could imagine that it was helpful for parents who did not always visit the same location (Heerwaarden & Pijpers, 2014).

The participants in this research reported that they only wanted to see information that was relevant for their situation. This also corresponds with the literature, in which the benefits of (individual) 'tailoring' was proved (Hine, Petersen, Pluke, & Sund, 2008; van Gemert-Pijnen, Peters, & Ossebaard, 2013).

The study of Carey et al. (2015) mentioned the accessibility in a range of languages. eHealth technology's should be programmed in a way that the user can select the language that is presented on screen (Carey, et al., 2015). In this research the parents and child health professionals mentioned this also as requirements for the eHealth technology.

The research of Nagler et al (2013) reported that by implementing eHealth applications by people with a lower social economic status, personal contact is important in the implementation of an eHealth technology (Nagler, Ramanadhan, Minsky, & Viswanath, 2013). This was confirmed in this research, most of the parents preferred personal contact with the child health professionals and wanted to get information about the eHealth technology in the contact moments.

Finally, most of the parents thought *privacy* was an important requirement for a personalized eHealth technology. In the literature, privacy was mentioned as the most important requirement, because eHealth information was probably the most personal and sensitive information that was available in an electronic form (Hine, Petersen, Pluke, & Sund, 2008).

5.3 Limitations of this research

There are some limitations applicable to this research. This research was limited to an eHealth technology, in a form of a portal for parents. The GGD West-Brabant limited the research to only a portal and not wanted to focusses on possible other solutions for the parents from the 'hard to reach' group.

The research contains interviews with five different child health professionals who were selected by the GGD themselves. The participants could not be representative, so this creates a possible selection bias. There was no influence on the choice which child health professionals participated. The interviewed child health professionals were all women, which was in accordance with the high percentage of women in this organization.

Also the child health professionals proposed the parents for this research. There was no influence on the selection process, because only the child health professionals had contact with the parents from those group. So also in this cases, there was a selection bias. It was possible that the parents who wanted to participate were more open towards eHealth than the parents who did not want to participate. This could give a distorted view of the results from the parents from the 'hard to reach' group.

The definition of 'hard to reach' groups in this research is doubtful, because it was possible to reach some parents for an interview. The child health professionals had already contact with them, so they were not so hard to reach. But otherwise there was not an option to interview parents when it was not possible to reach them.

In this research it was not possible to get in contact with fathers from the 'hard to reach' group. The child health professionals gave for the interview some names and phone numbers of people who wanted to participate. In most cases only the mother visited the child health professional. The child health professionals had hardly contact with the fathers, because he was working or another reason. Due to that and the limited time, no fathers participated in this research.

This research is not generalizable for the rest of the country, because in every region in the Netherlands there are different groups 'hard to reach'. This research is focussed on West-Brabant, where those four groups were the most difficult to reach, but this could be different for each region.

5.4 Practical recommendations

In this paragraph practical recommendations are made for the GGD West-Brabant, based on the interview with the child health professionals and parents.

Recommendation 1: The child health professionals have to promote the eHealth technology in their contact moments.
The child health professionals should explain the functionalities of an eHealth technology in their contact moments, because most of the parents mentioned this as the best method to get familiar with the eHealth technology. The child health professionals should login within the eHealth technology and demonstrate briefly the functions of the eHealth technology to the parents in the contact moments.

Recommendation 2: Possibility to switch the eHealth technology in different languages.
The eHealth technology should be available in different languages. At first the technology should be expanded to support English. At a later stage the technology could support languages such as Arabic, French and Eastern European languages. Currently a lot of immigrants who cannot read Dutch are unable to use the eHealth technology.

Recommendation 3: Design a mobile application of the current eHealth technology.
Alongside the website, a mobile application of the eHealth technology should be made available where they can find the same information

Recommendation 4: eHealth technology with information for the entire childhood period.
The current eHealth technology is too much focussed on the younger children. To make it more attractive for parents with older children is it important to add more relevant information and subject for those ages. For example, themes as menstruation, puberty, sex etc. The eHealth technology should contain a different page for every childhood period where parents can find relevant information for that childhood period

Recommendation 5: Special possibilities in the eHealth technology to make appointments on short notice for specific target groups.
Skipper mothers do not have regular work circumstances and they are limited in the choice of data to come to the child health clinic. The system should make room for skippers to make an appointment on short notice. Nowadays the skipper mothers have appointments during the lunch break of their child health nurse, because there were no other options left. It should be sufficient if the system had one hour per week where for example skipper parents are able to make an appointment on short notice.

Recommendation 6: Possibility to save and print the data from the eHealth technology.
It should be possible for parents to save and/or print the information in this portal. They will be able to show it to their children in the future. This is especially the case when the development book (groeiboekje) of the GGD will be replaced by the eHealth technology.

Recommendation 7: Instructions how to login in the eHealth technology.
Not all the parents know how DigiD works. It should be helpful when the child health professional demonstrate to the parents how to login with your DigiD. This is possible in the contact moments, where they should also explain the functions of the eHealth technology. Another improvement for the login page is an instruction about what DigiD actually is and where they can request it (also in English) for the parents who do not know DigiD and/or have no DigiD account.

Recommendation 8: Possibility to email directly.
Some parents named that mailing from the current eHealth technology was too complicated, so they would like to be able to email child health professionals directly. When direct mailing is abolished, some people can or will not contact the child health professionals anymore.

Recommendation 9: Overview of the vaccinations in the eHealth technology.
One child health professionals named that it would be helpful to have an overview of all the vaccinations that children receive in in the Netherlands. This is especially important for immigrant parents, because this can be different compared to their country of origin. One parent liked to see all the vaccinations her child already got (with dates) and which one he/she still needs. So the eHealth technology should offer information about all the vaccinations the children have to receive in the Netherlands. Next, there should be an overview of the vaccinations the child already received together with the dates.

Recommendation 10: General information about the preventive child health care in an eHealth technology.
Two child health professionals named that in the eHealth technology general information about the preventive child health care should be added, because not everybody knows exactly what the preventive child health professionals do and when you can contact them. One parent mentioned that a news update should be added to the eHealth technology, where relevant changes in the preventive child health care are displayed. A combination of those two things are useful for some parents from the hard to reach groups.

Recommendation 11: Extra information links in specific advice (Advies op Maat).
When the parents get advice from the 'specific advice function, an overview with websites/organisations/social workers should be given. Besides the advice the portal gave, it could be helpful to have links to other information recourses. For example, when the parent ask advice about nutrition, a link to the nutrition centre (voedingscentrum) should also be provided.

5.5 Conclusion

It can be concluded that most of the parents from the ‘hard to reach’ groups like to use a personalized eHealth technology where they can find information about their children and the possibilities to ask questions. The parents like to have a personalized eHealth technology in the form of a website and mobile application. About the current eHealth technology can be concluded that most of the parents like to use it, but they were not familiar with it. The parents should be informed about the eHealth technology by the child health professionals in their contact moments. For the current eHealth technology, the parents named some improvements. The eHealth technology should be offered in different languages and the functions should be more focussed on older children of the ‘hard to reach’ groups. An overview of the vaccinations and general information about the preventive child health care should be added, to fulfil the wishes and needs of those parents. Finally, it can be concluded that the face-to-face contact with the child health professionals should not be replaced by an eHealth technology, because eHealth should be only a tool according to the parents.

For future research, the other three phases of the CeHRes should be fulfilled to deliver an eHealth technology, especially for the parents from the four ‘hard to reach’ groups. Based on the outcomes of the contextual inquiry and value specification of this research , an improved design of the eHealth technology should be made. Prototypes should be developed and discussed for feedback with the parents from the ‘hard to reach’ groups. Also the use-case scenarios should be used in the formative evaluation, so that the user has a better image on how to use the technology in different daily situations. Finally, future research should be extended by investing more time in finding fathers who want to participate in this research.

Bibliography

Adler, N., & Newman, K. (2002). Socioeconomic disparities in health: pathways and policies. Health affairs, 60-76.

Baarda, B., Bakker, E., Fischer, T., Julsing, M., de Goede, M., Peters, V., & van der Velden, T. (2013). Basisboek kwalitatiek onderzoek. Groningen/Houten: Noordhoff uitgevers.

Balas, A., Krishna, S., & Tessema, T. (2008). eHealth: Connecting Health Care and Public Health. IOS Press, 169-176.

Bannink, R., Boeren, S., Joosten-van Zwanenburg, E., van As, E., van de Looij-Jansen, P., & Raat, H. (2014). Use and preciaion of a Web-based, tailored intervention combined with counseling to promoto adolescents health in preventive youth health care: survey and log-file analysis. JMIR Research protocols, 1-16.

Bannink, R., Broeren, S., Joosten-van Zwanenburg, E., van As, E., van de Looij-Jansen, P., & Raat, H. (2014). Effectiveness of a Web-Based Tailored Intervention (E-health4Uth) and Consultation to Promote Adolescents' Health: Randomized Controlled Tria. Journal of medical internet research, 1-13.

Beers, M., Iersel, S., & Steiner, M. (2014). Uit beeld? Kwetsbare mensen op vergeten plekken. Breda: GGD West-Brabant.

Boeije, H. (2002). A purposeful approach to the constant comparative method in the analysis of qualitative interviews. Utrecht: Kluwer academix publishers.

Buisman, M., & Houtkoop, W. (2014, April). ECBO. Retrieved Mei 18, 2016, from Laaggeletterdheid in kaart: http://www.lezenenschrijven.nl/uploads/editor/Laaggeletterdheid_in_Kaart_(2014).pdf

Carey, M., Noble, N., Mansfield, E., Waller, A., Henskens, F., & Sanson-Fisher, R. (2015). The role of eHealth in optimizing preventive care in the primary care setting. Journal of medical internet research, 1-6. doi:http://doi.org/10.2196/jmir.3817

Carroll, J. (2000). Making Use: Scenario-based Design of Human-Computer Interactions. Cambridge: MIT Press.

CBS. (2016). CBS. Retrieved Mei 31, 2016, from Begrippen: https://www.cbs.nl/nl-nl/onze-diensten/methoden/begrippen#id=allochtoon

Centraal bureau voor de Statistiek. (2015, Augustus 14). Statline. Retrieved Mei 18, 2016, from Bevolking: leeftijd, herkomstgroepering, geslacht en regio 1 januari: http://statline.cbs.nl/Statweb/publication/?DM=SLNL&PA=37713&D1=0,3,6&D2=0&D3=0-5,8,11,14,18,20-22,24,27,29,31-33,35-36,38-42,49,54&D4=49&D5=0,4,14,18-19&HDR=T,G4&STB=G1,G3,G2&VW=T

Chen, E., Matthews, K., & Boyce, W. (2002). Socioeconomic differences in children's health: How and why do these relationships change with age? Psychological Bulletin, 295-329.

de Boer, E., Kabos, E., Boekelo, F., Zwaag, J., & Feringa, D. (2006, September 28). Gemeente Vlagtwedde. Retrieved Mei 25, 2016, from Beleidsnotitie Permanente bewoning van recreatiewoningen: http://permanent-wonen-recreatiewoning.nl/Permanente%20Bewoning%20%20recreatiewoning%20Gemeente%20Vlagtwedde.pdf

de Vos, N., & Feenstra, D. (2013). Evalutatia van advies en voorlichting bij flexibilisering van contactmomenten tussen 6 en 11 maanden. Retrieved September 9, 2016, from Zonmw: http://www.zonmw.nl/fileadmin/documenten/Vernieuwing_Uitvoeringspraktijk_JGZ/flex_contacmoment_6_-_11_mnd_156512002/rapportage-bagage-onderzoek.pdf

de Wilde, J., van de Sande, M., Benning, T., Beijleveld, M., & Kocken, P. (2013, Maart). Bereik van moeilijk bereikbare groepen door het centrum jeugd en gezin Den Haag. Retrieved April 11, 2016, from AWPG: http://docplayer.nl/11213314-Bereik-van-moeilijk-bereikbare-groepen-door-het-centrum-jeugd-en-gezin-den-haag.html

den Hoed, A. (2015). eHealth in het gemeentelijk domein. Den Haag: Advies Consumenten-eHealth.

Diemen-Steenvoorde, J. (2014). De jeugdgezondheidszorg beter in positie. Utrecht: Inspectie voor de Gezondheidszorg.

Dubow, E., Boxer, P., & Huesmann, L. (2009). Long-term Effects of Parents' Education on Children's Educational and Occupational Success. Merill Palmer Q (Wayne state Univ Press), 224-249. Retrieved Juni 3, 2016, from Long-term Effects of Parents' Education on Children's Educational and Occupational Success: Mediation by Family Interactions, Child Aggression, and Teenage Aspirations.

Dunnink, G. (2010, November 19). Standpunt Bereik van de jeugdgezondheidszorg. Bilthoven: RIVM. Retrieved April 13, 2016, from Rijksinstituut voor Volksgezondheid en Milieu: http://www.rivm.nl/Documenten_en_publicaties/Wetenschappelijk/Rapporten/2010/november/Standpunt_Bereik_van_de_jeugdgezondheidszorg

Dunnink, G., & Lijs-Spek, W. (2008, februari). Activiteiten basistakenpakket jeugdgezondheidszorg 0-19 jaar per contactmoment. RIVM/Centrum Jeugdgezondheid. Retrieved juni 1, 2016, from Activiteiten basistakenpakket jeugdgezondheidszorg 0-19 jaar per contactmoment: https://www.rijksoverheid.nl/documenten/rapporten/2008/07/30/rivm-rapport-activiteiten-basistakenpakket

Esposito, I., Seker-Guezel, E., Meier, A., & Guerro, N. (2007, december 7). E-gorvernment and E-health portals. Fribourg: University of Fribourg. Retrieved Juni 1, 2016

Flanagan, S., & Hancock, B. (2010). 'Reaching the hard to reach' - lessons learned from the VCS (voluntary and community Sector). A qualitative study. BMC Health Services Research, 53-62.

Fogg, B. (2009). A behavior model for persuasive design. Persuasive, 26-29. Retrieved from bjfogg: http://bjfogg.com/fbm_files/page4_1.pdf

GGD West-Brabant. (2014, April 14). Unieke website Mijnd Kind in Beeld live. Retrieved April 7, 2016, from GGD West-Brabant:

http://www.ggdwestbrabant.nl/Actueel/Persberichten/2014/04/Unieke-website-Mijn-Kind-in-Beeld-live

GGD West-Brabant. (2015, Janauri 27). Jeugdgezondheidszorg van 0 tot 19 jaar. Retrieved April 7, 2016, from GGD West-Brabant: http://ggdwestbrabant.nl/Actueel/Nieuws/2015/01/Jeugdgezondheidszorg-van-0-tot-19-jaar

GGD West-Brabant. (2015). Profiel gemeenten WB. Breda, Noord-Brabant, Nederland.

GGD West-Brabant. (2016). Consulten 2015. Breda: GGD West-Brabant.

Heerwaarden, Y., & Pijpers, F. (2014). Samenwerken voor bijzondere groepen jeugdigen. Utrecht: Nederlands Centrum Jeugdgezondheid (NCJ).

Hine, N., Petersen, F., Pluke, M., & Sund, T. (2008). Standardization work on personalized eHealth systems. Vancouver: IEEE.

Holloway, I., & Wheeler, S. (2010). Qualitative research in nursing and healthcare. Chichester: Wiley-Blackwell.

Hopia, H., Punna, M., Laitinen, T., & Latvala, E. (2015). A patient as a self-manager of their personal data on health and disease with new technology – challenges for nursing education. Elsevier, 1-3.

Jacobs, A. (2015, Juli 13). eHealth op de werkvloer: ouders eigen regie over GGD gegevens van kinderen. Retrieved April 7, 2016, from smarthealth: http://www.kidos.nl/wp-content/uploads/2015/07/smarthealth.nl-eHealth-op-de-werkvloer-ouders-eigen-regie-over-GGD-gegevens-van-kinderen.pdf

Kontos, E., Blake, K., Chou, W.-Y. S., & Prestin, A. (2012). PRedictors of eHealth usage: Insights on the digital divide from the health information national trends survey 2012. Journal of medical internet research, 1-16.

Kulyk, O., op den Akker, R., Klaassen, R., & van Gemert-Pijnen, L. (2014). Personalized Virtual Coaching for Lifestyle Support: Principles for Design and. International Journal on Advances in Life Sciences, 300-307.

LeRouge, C., Ma, J., Sneha, S., & Tolle, K. (2013, November). User profiles and personas in the design and development of consumer health technologies. International journal of medical informatics, 251-268. doi:http://dx.doi.org/10.1016/j.ijmedinf.2011.03.006

LOVK. (2015). LOVK. Retrieved Juni 2, 2016, from Leerplicht voor varende kinderen: http://www.lovk.nl/

Lu, S., Hong, Y., Liu, Q., Wang, L., & Dssouli, R. (2008). Implementing Web-based e-Health portal systems. Montreal: Deparment of Computer Science and CIISE, Concordia University.

Luttmer, L. (2006). Nederlands leerboek jeugdgezondheidszorg. In H. Boudewijnse, E. van Lokven, E. Oskam, M. Boere-Boonekamp, M. de Kuiper, L. Luttmer, . . . J. Zandt. Assen: Uitgeverij van Gorcum.

Mangunkusumo R, B. J. (2007). Feasibility, acceptability, and quality of Internet-administered adolescent health promotion in a preventive-care setting. . Health Educ Res, 1-13.

Mantas, J., Andersen, S., Mazzoleni, M., Blobel, B., Quaglini, S., & Moen, A. (2012). Quality of life through quality of information. Amsterdam: IOS Press.

Miles, J., & Gilbert, P. (2005). A handboek of research methods for clinical and health psychology. New York: Oxford University press.

Nagler, R., Ramanadhan, S., Minsky, S., & Viswanath, K. (2013). Recruitment and Retention for Community-Based eHealth Interventions with Populations of Low Socioeconomic Position: Strategies and Challenges. J Commun, 201-220.

NCJ. (2014, Februari 4). NCJ. Retrieved from Landelijk professioneel kader uitvoering Basistakenpakket JGZ: https://assets.ncj.nl/docs/611d7081-fba7-4987-a5e9-24495e78e92a.pdf

Nederlands Centrum Jeugdgezondheid . (2015). NCJ. Retrieved from Digitaal dossier jeugdgezondheidszorg: http://www.ddjgz.nl/?pagina=47

Oinas-Kukkonen, H., & Harjumaa, M. (2009, Januari 3). Persuasive system design: key issues, process model, and system features. Cais, pp. 1-18. Retrieved Mei 18, 2016, from http://aisel.aisnet.org/cgi/viewcontent.cgi?article=3424&context=cais&sei-redir=1&referer=http%3A%2F%2Fscholar.google.nl%2Fscholar%3Fq%3Dpersuasive%2Bsystemd%2Besign%2Bmodel%2BOinas-Kukkonen%26hl%3Dnl%26as_sdt%3D0%26as_vis%3D1%26oi%3Dscholart%26sa%3DX%26v

Pijpers, F. (2016). Nieuwe technologie in de JGZ. Utrecht: NCJ.

Plochg, T., Juttman, R., Klazinga, N., & Mackenbach, J. (2007). Handboek gezondheidsonderzoek. Houten: Bohn Stafleu van Loghum.

Pommeranz, A., Brinkman, W.-P., Pascal, W., Broekens, J., & Jonker, C. (2009). Design guidelines for negotiation support systems: an expert perspective using scenarios. EccE, 1-8. Retrieved from http://ii.tudelft.nl/~joostb/files/DesignGuidelinesECCE09_final.pdf

Pruitt, J., & Grudin, J. (2003). Personas: practice and theory. Conference on Designing for users experiences (pp. 1-15). New York: ACM.

Regionaal Kompas Volksgezondheid West-Brabant. (2014, Maart 6). Regionaal kompas volksgezondheid West-Brabant. Retrieved Mei 18, 2016, from Wat is de hudige situatie in de regio: sociaal-economische status in West-Brabant: http://preview.regionaalkompas.nl/west-brabant/thema-s/segv/wat-is-de-huidige-situatie-in-de-regio/

Timmer, S. (2011). eHealth in de praktijk. Houten: Bohn Stafleu van Loghum.

van Beelen, M., Beirens, T., den Hertog, P., van Beeck, E., & Raat, H. (2014). Effectiveness of Web-Based Tailored Advice on Parents' Child Safety Behaviors: Randomized Controlled Trial. Journal of medical internet research, e17.

van Beelen, M., Vogel, I., Beirens, T., Kloek, G., van der Veen, M., & Raat, H. (2013). Web-Based eHealth to Support Counseling in Routine Well-Child Care: Pilot Study of E-health4Uth Home Safety. JMIR Res Protoc, e9.

van Bijsterveldt, M. (2010). Jeugdgezondheidszorg: buurtzorg voor de jeugd. Actiz, 12.

van den Berg, R., van der Gun, T., Kierczak, M., van de Kooij, A., & Ineke, W. (2005, Maart). Alle ouders hebben vragen. Retrieved April 7, 2016, from JSO: http://www.expoo.be/sites/default/files/atoms/files/alle_ouders_hebben_vragen.pdf

van der Zijden, A., & Poppe-de Looff, L. (2015, April 9). Beleidsbegroting 2016 GGD West-Brabant. Retrieved April 7, 2016, from GGD West-Brabant: file:///C:/Users/Gebruiker/Downloads/GGD%20WB%20beleidsbegroting%202016.pdf

van Gemert-Pijnen, J., Peters, O., & Ossebaard, H. (2013). Improving eHealth. Den Haag: Eleven.

van Rijn, M. (2014). Besluit van 5 november 2014, houdende aanpasing van het Besluit publieke gezondheid vanwege gewijzigd basistakenpakket jeugdgezondheidszorg. Staatsblad van het Koninkrijk der Nederlanden, 1-10.

van Velsen, L., van Gemert-Pijnen, L., Nijland, N., Beaujean, D., & Steenbergen, J. (2012). Personans: The linking pin in holistic design for eHealth. eTELEMED, 1-6.

van Velsen, L., van Gemert-Pijnen, L., Nijland, N., Beaujean, D., & Steenbergen, J. (2012). Personas: The linking pin in holistic design for eHealth. eTELEMED, 128-133.

Van Velsen, L., Wentzel, J., & Van Gemert-Pijnen, J. E. (2012). Designing eHealth that Matters via a Multidisciplinary Requirements Development Approach. JMIR Research Protocols 2, 1-12.

Verloove-Vanhorick, S., Verkerk, P., Leerdam, F., Reijneveld, S., & Hirasing, R. (2003). Youth health care: much prevention for little money. Nederlands tijdschrift geneeskunde, 895-898.

Voorham, T., Valstar, I., van der Poel, A., & Kocken, P. (2015). E-Health in preventie en zorg: It is time to make a bigger leap! TSG, 41-42.

Wieske, R., Nijnuis, M., Carmiggelt, B., Wagenaar-Fischer, M., & Boere-Boonekamp, M. (2011). Preventive youth health care in 11 European countries: an exploratory analysis. Intrnational journal of public health, 637-641.

Zarrinkhameh, A. (2015). Gebruik van eHealth bij zelfmanagement. Den Haag: advies Consumenten eHealth.

Appendix 1: Interview child health professionals (Dutch)

Draaiboek

Voorbereiding:

- Telefoon + oplader
- Interview uitgeprint
- Pen
- Informatie brief meenemen

Introductie

- Student afstudeeronderzoek master Gezondheidswetenschappen aan de Universiteit van Twente.

Doel onderzoek:

- In dit onderzoek wil ik kijken wat de wensen en behoeften van ouders zijn met betrekking tot de jeugdgezondheidszorg en eHealth

Procedure:

- Interview zal ongeveer 30-45 minuten duren.

Informatie brief:

- De informatie brief voorlezen

Geluidsopname:

- Om de data zo goed mogelijk verwerken zal er een geluidsopname worden gemaakt. Deze wordt na het onderzoek verwijderd.

Vragen:

- Mogelijkheid tot vooraf vragen stellen van de deelnemer

Interview:

- Deel 1: algemene introductie over de aard van het werk, om een indruk te krijgen van het werkzaamheden.
- Deel 2: Moeilijkbereikbare groepen in het werkveld
- Deel 3: eHealth, met als voorbeeld het ‘ mijn kind in beeld’ portal
- Deel 4: Ruimte voor vragen en/of opmerkingen

Afsluiting:

- Bedanken voor de medewerking.

Informatiebrief

UNIVERSITEIT TWENTE.

Beste mevrouw….

Mijn naam is Deirdre van den Nieuwenhuizen en namens de GGD West-Brabant, doe ik een afstudeeronderzoek voor mijn master Gezondheidswetenschappen aan de Universiteit Twente. Met dit onderzoek wil ik kijken naar de wensen en behoeften van ouders uit moeilijk bereikbare groepen, omtrent de online informatie voorziening van de GGD. Aan de hand van een kort interview zou ik graag meer informatie verkrijgen, over de moeilijke doelgroepen waar u mee werkt.

Onder de definitie moeilijk bereikbare groepen vallen in dit interview de groepen waarvoor men een boodschap meent te hebben, maar waarbij de communicatie met de doelgroep niet of uiterst moeizaam tot stand komt.

Ik wijs er met nadruk op, dat de informatie die u verstrekt hoogst vertrouwelijk behandeld zal worden. Informatie zal ook nooit doorgegeven worden aan derden.

Het vraaggesprek zal ongeveer 30-45 minuten in beslag nemen. Ik zou in het interview de volgende drie onderdelen die alle drie ongeveer 10-15 minuten zullen duren, met u bespreken:

- Als eerste begin ik met een algemene introductie waarin ik u zal vragen naar de aard van uw werk, om een indruk te krijgen van uw werkzaamheden.
- Vervolgens wil ik het graag hebben over de verschillende groepen waar u mee werkt, in het specifiek de ‘moeilijkere bereikbare’ groepen.
- Ten slotte wil ik het hebben over het eHealth hebben, met als voorbeeld het ‘ mijn kind in beeld’ portal

Om er zeker van te zijn dat ik uw antwoorden goed overnemen zou ik het gesprek graag opnemen.

Gaat u hiermee akkoord?

Heeft u eventuele vragen voor dat we beginnen?

Interview jeugdverpleegkundig/arts

Datum: Tijd: Locatie: Interviewnummer:

Deel 1: Persoonlijke gegevens

Vraag 1: Met welk leeftijdsklasse werkt u?

Vraag 2: Wat is functie?

Vraag 3: Hoelang bent u hier al werkzaam?

Vraag 4: Wat zijn uw werkzaamheden op een dag?

Deel 2: Moeilijk bereikbare groepen in het werkveld

Vraag 5: Op welke manieren binnen uw werk heeft u te maken met 'moeilijk bereikbare' groepen?

Vraag 6: Met welke 'moeilijke bereikbare' groepen heeft u vooral tijdens uw werkzaamheden te maken?

Vraag 7: Met hoeveel kinderen uit de ' moeilijk bereikbare' groepen heeft u in het werk te maken mee?

Vraag 8 : Hoe vaak ziet u de kinderen en ouders van 'moeilijk bereikbare' groepen gemiddeld? Is dat vaker of minder vaak dan andere kinderen en ouders?

Vraag 9: Hoe ervaart u het contact met deze 'moeilijk bereikbare' groepen?

Vraag 10: Is de zorg/service die u levert aan deze 'moeilijke bereikbare' groepen afwijkend?

Vraag 11: Over welke onderwerpen hebben de ouders de meeste vragen?

Deel 3: Mijn kind in beeld portal

Vraag 12: Bent u bekend met het mijn kind in beeld portal?

Vraag 12a: Zo ja, op welke manier bent u in aanraking gekomen met dit portal? Heeft u een voorlichting of training gehad over het 'mijn kind in beeld' portal vanuit de GGD?

Vraag 13: Weet u of ouders (vooral uit de moeilijke bereikbare groepen) bekend zijn met mijn kind in beeld?

Vraag 13a: Zo ja, welke functies worden veelal gebruikt door ouders en welke ervaringen hoort u van de ouders over het portal?

Vraag 13:b Zo nee, wat zijn volgens u de oorzaken dat de ouders het portal niet gebruiken?

Vraag 14: Worden ouders voorgelicht tijdens uw spreekuren over het mijn kind in beeld portal en welke opties het portal biedt?

Vraag 15: Buiten eventuele voorlichting van u over mijn kind in beeld tijdens een afspraak. Op welke andere manier wordt het mijn kind in beeld portal gepromoot bij (moeilijk bereikbare) doelgroepen en is dit volgens u een goede manier?

Vraag 16: Ziet u knelpunten bij het gebruik van het kind in beeld portal, bij deze moeilijk bereikbare groepen?

Vraag 17: Wat zijn volgens u verbeterpunten aan het 'mijn kind in beeld' portal, om het toegankelijker te maken voor 'moeilijk bereikbare' doelgroepen? Bijv. Simpelere taal, lay-out, meer functies?

Vraag 18: Aan welke eisen moet een eHealth technologie, in dit geval het 'mijn kind in beeld 'portal, volgens u aan voldoen?

Vraag 19: Op welke manier zou u de contacten momenten met ouders uit 'moeilijk bereikbare' groepen willen zien? Zouden er bijvoorbeeld meer groepsmomenten moeten komen of moet het individueel blijven? Zou dit ook online kunnen gebeuren of liever face-to-face?

Vraag 20: Op welke manier zou eHealth het best aangeboden kunnen worden (mobiele applicatie, website etc)

Dit is het laatste gedeelte van het interview. Hier wil ik u de ruimte geven voor het maken van opmerkingen die u van belang acht voor het mijn kind in beeld portaal, omtrent moeilijke bereikbare doelgroepen?

Vraag 21: Wilt u nog opmerkingen maken met betrekking tot het interview?

Appendix 2: Interview parents from the ‘hard to reach’ groups (Dutch)

Draaiboek

Voorbereiding:

- Telefoon + oplader
- Laptop met de presentatie van MKIB
- Vragenlijst + interview uitgeprint
- Pen
- Toestemmingsverklaring
- Informatie brief vooraf opsturen

Introductie

- Student afstudeeronderzoek master Gezondheidswetenschappen aan de Universiteit van Twente.

Doel onderzoek:

- In dit onderzoek wil ik kijken wat de wensen en behoeften van ouders zijn met betrekking tot de (online) informatie voorziening en het mijn kind in beeld portal van de JGZ.

Procedure:

- Interview zal ongeveer 30-45 minuten duren.

Toestemmingsverklaring:

- Geïnterviewde onderzoeker informeren over de anonimiteit van het onderzoek en verklaring laten tekening.

Geluidsopname:

- Om de data zo goed mogelijk verwerken zal er een geluidsopname worden gemaakt. Deze wordt na het onderzoek verwijderd. Het gehele onderzoek is anoniem. Toestemming vragen geluidsopname.

Vragen:

- Mogelijkheid tot vooraf vragen stellen van de deelnemer

Vragenlijst

- Opnamen apparatuur aanzetten
- Vragenlijst zelf mondeling afnemen

Interview:

Deel 1: Contactmomenten jeugdgezondheidszorg

- Vragen of er nog vragen zijn naar aanleiding van de vragenlijst

Deel 2: Informatie voorziening

Deel 3: Behoeften online dossier

- Uitleg geven wat wordt bedoeld met een online dossier

Deel 4: Mijn kind in beeld

- Eerst pijlen of ouders bekend zijn met het portal. Daarna de vragen stellen bij het gegeven antwoord van de ouder of ze bekend en/of gebruiker zijn van het MKIB portal.
- Alle ouders presentatie laten zien MKIB op de laptop
- Vragen ouders wel bekend zijn met het portal, maar niet gebruiken. Die moeten wel eens in het portaal zijn geweest voor deze vragen.

Afsluiting:

- Ruimte geven voor het maken van opmerkingen op het onderzoek
- Tenslotte vraag ik of ze de resultaten van het onderzoek zou willen ontvangen? Zo ja, email adres noteren
- Bedanken voor de medewerking

Toestemmingsverklaringformulier (informed consent)

Titel onderzoek: Empowering the 'hard to reach' parents in the preventive child health care via persuasive eHealth technology

Verantwoordelijke onderzoeker: Deirdre van den Nieuwenhuizen

In te vullen door de deelnemer

Ik verklaar op een voor mij duidelijke wijze te zijn ingelicht over aard, methode en doel van het onderzoek. Ik weet dat de gegevens en resultaten van het onderzoek alleen anoniem en vertrouwelijk aan derden bekend gemaakt zullen worden. Mijn vragen zijn naar tevredenheid beantwoord.

Ik begrijp dat de geluidsopnames tijdens het interview uitsluitend voor analyse en/of wetenschappelijke presentaties zullen worden gebruikt.

Ik stem geheel vrijwillig in met deelname aan dit onderzoek. Ik behoud me daarbij het recht voor om op elk moment zonder opgaaf van redenen mijn deelname aan dit onderzoek te beëindigen.

Naam deelnemer:…….

Datum:…..-…….-…….. Handtekening deelnemer:……

In te vullen door de uitvoerende onderzoeker

Ik heb een mondelinge en schriftelijke toelichting gegeven op het onderzoek. Ik zal resterende vragen over het onderzoek naar vermogen beantwoorden. De deelnemer zal van een eventuele voortijdige beëindiging van deelname aan dit onderzoek geen nadelige gevolgen ondervinden.

Naam onderzoeker:…….

Datum:…..-…….-…….. Handtekening onderzoeker:……

Informatie brief

Breda, 2016

Beste ouder,

In deze brief wil ik u graag informeren over mijn onderzoek. Mijn naam is Deirdre van den Nieuwenhuizen en namens de GGD West-Brabant, doe ik een afstudeeronderzoek voor mijn master Gezondheidswetenschappen aan de Universiteit Twente. In mijn onderzoek wil ik mij richten op de wensen en behoeften van ouders met kinderen tussen de 0-12 jaar oud met betrekking op de (online) informatievoorziening van de jeugdgezondheidszorg.

In het interview wil ik mij focussen op de informatievoorziening van de GGD, wat voor en op welke manier u informatie graag ontvangt. Op welke manier u het liefst contact heeft met de GGD, als u bijvoorbeeld vragen heeft of als u een afspraak wil maken. En tenslotte wil ik samen met u naar het 'Mijn kind in beeld' portaal van de GGD kijken.

Het interview zal tussen de 30-40 minuten duren. Tijdens het interview kunt u altijd besluiten om te stoppen zonder dat dit voor u consequenties heeft. U hoeft geen reden aan te geven waarom u wilt stoppen. Tot 24 uur na het onderzoek kunt u besluiten dat uw gegevens niet verder mee worden genomen in het onderzoek.

Met uw gegevens wordt op een vertrouwelijke wijze omgegaan en de anonimiteit van uw gegevens is gewaarborgd. De gegevens zullen nooit aan derden zonder uw toestemming worden verstrekt. Na afloop van het volledige onderzoek kunt u, indien u dat wenst, over de verkregen resultaten op de hoogte worden gesteld via de e-mail.

Als u na deze brief alsnog vragen heeft, neem dan gerust contact op.

Met vriendelijke groet,

Deirdre van den Nieuwenhuizen

Email: D.Nieuwenhuizen@ggdwestbrabant.nl Tel: 06-36425505

Bij eventuele klachten kunt u de heer Rademaker benaderen op j.rademaker@utwente.nl.

Interview ouders

Datum: Tijd: Locatie: Interview nummer:

Deel 1: Vragenlijst demografische gegevens

1) Persoonlijke gegevens

- Geslacht: Man/Vrouw
- Leeftijd:_____
- Aantal kinderen:_____
- Leeftijd kind(eren):_____
- Getrouwd: Ja/Nee
- Beschikt u tot een DIGI D account: Ja/Nee

2) Afkomst

- Geboorteland:_____ *
- Geboorteland echtgenoot_____
- Geboorteland kind(eren):_____
- Moedertaal:_____
- Welke taal spreek u met de kind(eren):_____

3) Opleiding/werk

- Opleidingsniveau (laatst behaalde diploma): _____*
- Werkzaam: Ja/Nee Zo ja, hoeveel uur per week:_____

*Wanneer opleidingsniveau lager is dan Lager Beroeps Onderwijs. Introduceren dat er in Nederland 1 op de 10 volwassen moeite heeft met lezen en schrijven.

- Heeft u moeite met lezen en/of schrijven?

_____

*Wanneer ouder van niet-Nederlandse afkomst

- Heeft u moeite met het lezen en/of schrijven van de Nederlandse taal?

_____

*In land van herkomst scholing gevolgd? (Tot welke leeftijd, diploma's etc)

- _____

4) Toegang tot hulpmiddelen

- Tot welke sociale media heeft u toegang in u huis? *(Meerdere antwoorden zijn mogelijk)*
    - Computer/Laptop
    - Tablet/ Ipad
    - Mobiele telefoon
    - Anders, namelijk……
- Welke toegang tot het internet heb je thuis? *(meerdere antwoorden zijn mogelijk)*
    - Vaste internettoegang
    - Wifi
    - Mobiel internet
    - Geen

- Anders, namelijk_____

- Hoe vaak maakt u gebruik van het internet?
  - Dagelijks
  - Wekelijks
  - Maandelijks
  - Nooit

Deel 2: Interview

Contactmomenten Jeugdgezondheidszorg

Vraag 1: Hoe vond u het (laatste) gesprek met de jeugdarts of jeugdverpleegkundige?

Vraag 2: Wat vond u van de informatie en adviezen die ze heeft gegeven over uw kind?

Vraag 3: Heeft u iets gemist tijdens het gesprek wat u wel had willen bespreken met de arts/verpleegkundige?

Vraag 3a: Zo ja, hoe komt het dat u iets heeft gemist (bijvoorbeeld door taboe, geloof, geen tijd) en hebt u ideeën hoe dat verbeterd zou kunnen worden?

Vraag 4: Op welke manier(en) zou u contact willen hebben met een jeugdarts/jeugdverpleegkundige? *(Meerdere antwoorden zijn mogelijk)*

- Face-to-face
- Beeldbellen
- Telefoon (bellen/smsen)
- Whatsapp
- Chatten
- Mail
- Anders, namelijk……

Vraag 4a: Wat is de reden waarom u het om deze manier(en) graag zou willen?

Vraag 5: Op welke manieren zou u het liefst afspraken voor consulten willen maken/wijzigen met de jeugdverpleegkundige/jeugdarts?

- Telefonisch
- Mail
- Sms
- Whatsapp
- Website
- Langsgaan
- Anders, namelijk……..

Vraag 5a: Waarom wilt u dat het liefst op deze manier?

Vraag 6: Voorafgaand aan een afspraak bij de jeugdarts/verpleegkundige is het voor u duidelijk wat er gaat gebeuren in het consult?

Vraag 6a: Zo ja, op welke manier bent er daar achter gekomen?

Vraag 6b: Zo nee, op welke manier zou u die informatie graag ontvangen?

Vraag 7: Wanneer u vragen heeft over de gezondheid, ontwikkeling of opvoeding van uw kind, wat doet u dan? *(Meerdere antwoorden zijn mogelijk)*

- Vragen aan een jeugdarts/jeugdverpleegkundige
- Vragen aan de huisarts
- Vragen aan familieleden
- Vragen aan vrienden/ andere ouders
- Vragen aan de leraar kracht van het kind
- Zoeken op internet (bijv. google)
- Anders, namelijk……

Vraag 8: Wanneer u extra informatie zou willen hebben over bijvoorbeeld de gezondheid en ontwikkeling van uw kind, op welke manier zou u dat graag krijgen? *(Meerdere antwoorden zijn mogelijk)*

- Extra gesprek met een hulpverlener
- Een online beeld gesprek met een hulpverlener
- Een telefonisch gesprek met een hulpverlener
- Via de mail met een hulpverlener
- Via sms/whatsapp met een hulpverlener
- Via een vragen bank op een website
- Via een forum met hulpverlener en andere ouders
- Groepsbijeenkomsten met andere ouders en een hulpverlener
- Sociaal media (Facebook, Twitter)
- Anders, namelijk……

Vraag 9: Over welke problemen/onderwerpen, op het gebied van de ontwikkeling en gezondheid van uw kind heeft u vaak vragen over?

Vraag 10: Zijn er onderwerpen rondom u kind die u liever niet met de jeugdverpleegkundige/jeugdarts bespreekt, maar wel graag informatie over wil hebben?

Vraag 11: Heeft u behoefte aan een online dossier, waarin u zelf de gegevens zoals de groei en gewicht van uw kind kan zien? Waarom wel of niet?

Vraag 12: Heeft u behoefte aan een online dossier, waar u advies kan krijgen wanneer u vragen heeft over de gezondheid en ontwikkeling van uw kind? Waarom wel of niet?

Vraag 13: Zou u het gehele dossier dat de jeugdverpleegkundige/jeugdarts bijhoudt van uw kind graag online willen kunnen inzien? Waarom wel, waarom niet?

Deel 3: Interview 'Mijn kind in beeld' portal

Vraag 1: Bent u bekend met het 'mijn kind in beeld' portal van de GGD?

Vraag 1a: Zo ja, op welke manier bent u ermee in contact gekomen? *

- Via de doktersassistent/ jeugdverpleegkundige/ jeugdarts
- Website GGD
- Brief GGD
- Folder
- Via vrienden of familie
- Anders, namelijk____

Vraag 1b: Zo niet, hoe had u geïnformeerd willen worden over het bestaan van het 'Mijn kind in beeld' portal?

- In een gesprek met een jeugdverpleegkundige/ jeugdarts
- Via een mail met uitleg over het portal vanuit de GGD
- Via een brief met uitleg over het portal vanuit de GGD
- Via een folder
- Op de website van de GGD
- Anders, namelijk…..

*Vraag 2: U geeft aan bekend te zijn met het portal, maakt u ook gebruik van het portal 'Mijn kind in beeld'?

Vragen ouders wel bekend zijn met het portal, maar niet gebruiken.
(Ouders die wel eens in het portal zijn geweest)

Vraag 3: Wat vind u van zo'n portal, waar u informatie en adviezen kan krijgen?

Vraag 4: Wat is de reden dat u het 'Mijn kind in beeld' portal niet gebruikt?

Vraag 5: Wanneer zou u bijvoorbeeld het portal als het 'Mijn kind in beeld' wel gaan gebruiken? (aan welke eisen zou het moeten voldoen als je het wel wil gebruiken?)

Vraag 6: Wat vindt u van de opmaak van het 'Mijn kind in beeld' portal?

Vraag 7: Welke voordelen ziet u aan het 'Mijn kind in beeld' portal?

Vraag 8: Welke nadelen ziet u aan het 'Mijn kind in beeld' portal?

Vragen ouders wel bekend zijn met het portal en ook gebruiken.

Vraag 9: Wat vind u van zo'n portal, waar u informatie en adviezen kan krijgen?

Vraag 10: Welke functies gebruikt u bij het 'Mijn kind in beeld' portal?

Vraag 11: Wat vindt u van de opmaak van het 'Mijn kind in beeld' portal?

Vraag 12: Wat vindt u voordelen aan het ‘Mijn kind in beeld’ portal?

Vraag 13: Wat vindt u nadelen aan het ‘Mijn kind in beeld’ portal?

Vraag 14: Wat zou er verbeterd kunnen worden aan het ‘Mijn kind in beeld’ portal?

Vragen ouders die niet bekend zijn met het portal.
(Ook ouders die alleen bekend met de naam zijn, maar nog niet gebruikt hebben)

Vraag 15: Wat is uw eerste indruk van het portal waar u informatie en adviezen kan krijgen?

Vraag 16: Nu u het ‘Mijn kind in beeld’ portal heeft gezien als voorbeeld voor informatie tips en adviezen van de JGZ, zou u zoiets dan gaan gebruiken? Waarom wel of niet? (aan welke eisen zou het moeten voldoen als je het wel wil gebruiken?)

Vraag 16a: Ja: Voor welke vragen of problemen zou je zoiets willen gebruiken?

Vraag 16b: Niet, op welke andere manier zou u graag informatie en adviezen krijgen?

Vraag 17: Welke voordelen ziet u aan het ‘Mijn kind in beeld’ portal?

Vraag 18: Welke nadelen ziet u aan het ‘Mijn kind in beeld’ portal?

Vraag 19: Wat zou er volgens u verbeterd kunnen worden aan het ‘Mijn kind in beeld’ portal?

Vraag 20: Wat vind u van de manier hoe de informatie wordt aangeboden?

Vraag 21: Wilt u nog opmerkingen maken met betrekking tot het interview?

Appendix 3: Coding scheme child health professionals (Dutch)

Achtergrond Informatie		
Hoofdcode	**Beschrijving**	**Subcode(s)**
Leeftijdsklasse	Respondent benoemt met welke leeftijdsklasse ze werkt	0-4 jaar
		4-18 jaar
Werkzaam	Respondent benoemt het aantal jaar dat ze werkzaam is binnen de JGZ	
Functie	Respondent benoemt de functie die ze heeft	Jeugdverpleegkundige
		Jeugdverpleegkundige specialist
		jeugdarts
Ervaring contact met moeilijk bereikbare groepen		
Hoofdcode	**Beschrijving**	**Subcode(s)**
Moeilijk bereikbare groepen	Respondent geeft aan met welke moeilijk bereikbare groepen ze werkt	Camping bewoners
		Lage SES
		Allochtonen
		Schipper
Ervaring contact/bereikbaarheid	Respondent geeft aan hoe ze het contact/bereikbaarheid met moeilijk bereikbare groepen ervaart	Positieve ervaring
		Negatieve ervaring
Werkwijze	Respondent benoemt haar werkwijze om de moeilijk bereikbare groepen te bereiken	Via scholen, instellingen of gemeente
		Langsgaan
Barrières contact	Respondent benoemt welke barrières ze ervaart in het contact met moeilijk bereikbare groepen	Taal
		Moeilijk contact te krijgen of behouden
		Transport
		Vaak verhuizen
Afwijkend contact	Respondent benoemt dat het contact met de moeilijkbereikbare groepen afwijkend is vergeleken met reguliere groepen	Vaker contact
		Onregelmatiger
		Minder vaak contact
Afwijkend service	Respondent benoemt op welke manier de service afwijkt bij de moeilijke bereikbare groepen	Telefoonnummer,mail of adres geven
		Meer tijd aanbesteden
Veelvoorkomende vragen	Respondent benoemt de meest veelvoorkomende vragen van ouders	Bevestiging
		Voeding
		Slapen
		Huilen
		Medische vragen
		Gedrag
		Vaccinaties
Suggesties contact	Respondent benoemt op welke manier ze graag contact heeft met de moeilijk bereikbare groepen	Face-to-face
		Mail positief
		Mail negatief
		Whatsapp positief
		Whatsapp negatief
		Sms positief
		Sms negatief
		Bellen positief
		Bellen negatief
		Beeldbellen positief
		Beeldbellen negatief
		Groepsbijeenkomst positief
		Groepsbijeenkomst negatief

Houding tegenover eHealth		
Hoofdcode	**Beschrijving**	**Subcode(s)**
Digitaliseren	Respondent benoemt hoe ze tegenover digitaliseren in de jeugd gezondheidszorg staat	Terughoudend
		Positief
Terughoudende houding eHealth	Respondent benoemt waarom ze terughoudend is tov eHealth	Niet direct noodzakelijk
		Systeem moet goed werken

Ervaring met de huidige eHealth technologie		
Hoofdcode	**Beschrijving**	**Subcode(s)**
Verpleegkundige bekend met MKIB	Respondent benoemt in hoeverre ze bekend of onbekend is met het MKIB portaal	Bekend met MKIB
Informatie gehad over MKIB	Respondent benoemt in hoeverre ze informatie vanuit de GGD heeft gekregen over het MKIB portaal	Informatie gekregen
		Geen informatie gekregen
Portaal promoten bij ouders	Respondent benoemt in hoeverre en met welke middelen ze het MKIB portaal promoot bij ouders	Niet gepromoot
		Flyers
		Consult
		Brief
Ouders bekend met MKIB	Respondent benoemt in hoeverre ze denkt dat ouders met het MKIB portaal bekend zijn	Bekend met MKIB
		Onbekend met MKIB
Gebruik functies ouders	Respondent benoemt welke functies door ouders worden gebruikt	Afspraken maken/wijzigen
		Groei en lengte curve
Knelpunten	Respondent benoemt de knelpunten in het gebruik van het MKIB portaal voor moeilijk bereikbare ouders	Moeilijk te gebruiken
		DigiD
		Taal
		Geen computer of internet
Verbeteringen	Respondent benoemt suggesties/aanbevelingen/ideeën/verandering en voor het MKIB portaal	Verschillende talen
		Advies op maat
		Algemene informatie JGZ
		Voeding advies
		Vaccinaties overzicht
		Advies registreren in MKIB
		Dossier zichtbaar
		Afspraken maken/wijzigen

5.Verwachting van een eHealth technologie		
Hoofdcode	**Beschrijving**	**Subcode(s)**
Voorkeur soort eHealth	Respondent geeft haar voorkeur aan een soort eHealth technologie	Website
		Mobiele applicatie
Eisen eHealth	Respondent geeft de eisen voor een eHealth technologie aan	Privacy
		Toegankelijkheid
		SMS reminder
		Betrouwbare informatie

Appendix 4: Coding scheme parents from the 'hard to reach' group (Dutch)

Demorgrafische gegevens		
Hoofdcode	**Beschrijving**	**Subcode(s)**
Internet	Respondent geeft aan in hoeverre ze toegang heeft tot internet	Toegang moeilijk
		Toegang tot internet
Ervaring en verwachtingen huidige jeugdgezondheidszorg		
Hoofdcode	**Beschrijving**	**Subcode(s)**
Ervaring gesprekken	Respondent geeft aan hoe hij/zij de gesprekken ervaart	Positieve ervaring
		Minder goede ervaring
Informatie/Advies	Respondent geeft aan wat ze de informatie/adviezen vind	Bruikbaar
		Minder bruikbaar
Bereikbaarheid	Respondent benoemt wat ze over de bereikbaarheid van de GGD vindt	Slecht bereikbaar
Suggesties contact	Respondent geeft aan hoe ze graag contact heeft met de jeugdverpleegkundige en waarom op deze manier	Face-to-face positief
		Telefoon positief
		Telefoon negatief
		Beeldbellen negatief
		Whatsapp positief
		Whatsapp negatief
		Mail positief
		Mail negatief
Suggesties afspraken maken/wijzigen	Respondent geeft aan hoe ze graag afspraken maken en/of wijzigen en waarom op deze manier	Telefonisch
		Mail
		Op de locatie
		Website
Voorafgaand aan een afspraak	Respondent benoemt in hoeverre voorafgaand aan een afspraak met de jeugd professional alles duidelijk is.	Alles duidelijk
Hulpbronnen informatie verkrijgen	Respondent benoemt welke hulpbronnen ze gebruikt om informatie te verkrijgen	Jeugdverpleegkundige/ arts
		Familie
		Vrienden
		Internet positief
		Internet negatief
		leraar
Suggesties extra informatie verkrijgen	Respondent geeft aan op welke manier ze graag extra informatie ontvangt	afspraak
		mail
		Telefoon
		Groepsbijeenkomst positief
		Groepsbijeenkomst negatief
		Youtube
Veelvoorkomende vragen	Respondent benoemt over welke onderwerpen ze de meeste vragen heeft	Voeding
		Ontwikkeling
		Geslachtsdelen wassen
		Tandenpoetsen
		Slapen
		Gewicht
		Ogen
		Amandelen
		Groei
		Borstvoeding

Onbespreekbare onderwerpen	Respondent benoemt onderwerpen die ze liever niet met de jeugd professionals bespreekt	Geslachtsdelen wassen
		Geen

Houding tegenover eHealth		
Hoofdcode	**Beschrijving**	**Subcode(s)**
Groei en lengte curves	Respondent geeft aan wat ze vind van het online zetten van groei en lengte curves	Positief
		Terughoudend
Voordelen groei en lengte curve online	Respondent benoemt de voordelen van de groei en lengte curve online	Partner/familie thuis laten zien
		Automatisch ingevuld
		Andere zorgprofessionals laten zien
		Bevestiging
Informatie/advies	Respondent geeft aan wat ze vind van online informatie en advies krijgen	Positief
		Terughoudend
Online dossier	Respondent geeft aan wat ze vind van een online dossier	Positief
		Terughoudend

Ervaring met de huidige eHealth technologie		
Hoofdcode	**Beschrijving**	**Subcode(s)**
Bekend met MKIB	Respondent geeft aan in hoeverre ze bekend zijn met het MKIB portaal	Bekend
		Onbekend
MKIB bekeken	Respondent geeft aan in hoeverre ze het MKIB portaal ooit heeft bekeken	Bekeken
		Nooit bekeken
Hoe geïnformeerd over MKIB	Respondent benoemt hoe ze is geïnformeerd over het MKIB portaal	Brief
		Via jeugdprofessional
		Via vrienden/familie
		Mail
Hoe geïnformeerd willen worden over MKIB	Respondent geeft aan hoe ze geïnformeerd zou willen worden over het MKIB portaal	Via jeugdprofessional
Eerste indruk	Respondent geeft aan wat haar eerste indruk van het MKIB portaal is	Positief
		Terughoudend
Gebruiken in de toekomst	Respondent geeft aan in hoeverre ze het MKIB portaal willen gebruiken in de toekomst	Positief
		Terughoudend
Voor wat MKIB in de toekomst gebruiken	Respondent benoemt wanneer ze het MKIB in de toekomst zou gebruiken	Ontwikkeling
		Groei en lengte curve en van Wiechen
		Vragen stellen
		Tips krijgen
		Afspraken maken/wijzigen
Gebruiker MKIB	Respondent die het MKIB portaal heeft gebruikt, geeft aan wat ze van het portaal vind	Algemene indruk
		Functies
		Opmaak
Voordelen functies MKIB	Respondent benoemt de voordelen van de functies in het MKIB portaal	Groei en lengte curve, van Wiechen
		Betrouwbaar
		Advies op maat
		Afspraken maken/wijzigen
		Online vragenlijsten
		Contact formulier
Nadelen functies MKIB	Respondent benoemt de nadelen van de functies in het MKIB portaal	Advies op maat
		Contact formulier
		Afspraken maken/wijzigen

Barrières gebruik MKIB	Respondent benoemt de barrières in het gebruik van het MKIB portaal	Taal
		DigiD
		Niet voor elke leeftijd bruikbaar
		Geen reden om te bezoeken
		Computer
		Teveel manieren om contact te leggen
Verbeteringen MKIB	Respondent geeft suggesties/aanbevelingen/ideeën/veranderingen voor het MKIB portaal	Taal
		Flexibiliteit afspraken
		Meer gericht op oudere kinderen
		Vaccinatie overzicht
		Contact andere ouders
		Persoonlijker
		Informatie groeiboekje in portaal
		Opslaan en printen gegevens portaal
		Nieuws pagina
		Alle informatie over het kind zichtbaar

Verwachtingen van een eHealth technologie

Hoofdcode	**Beschrijving**	**Subcode(s)**
Soort eHealth technologie	Respondent benoemt haar voorkeur in soort eHealth	Website
		Mobiele applicatie
		YouTube video's
Eisen eHealth technologie	Respondent benoemt de eisen aan een eHealth technologie	Veilig
		Duidelijk en overzichtelijk
		Betrouwbare informatie
		Begrijpbaar
		Makkelijk te gebruiken
		Contact met andere ouders
		Persoonlijk

Appendix 5: Overview health and technical specifics persona 1

Health specifics

Interview segment	The group with one child	Sample quote	Translation to persona
Information sources	Besides the child health professionals, than family and internet	''I search there on YouTube, what he can eat and what I play with him''	She contacts the child health professional for answers when she has questions about her child. Besides the child health professionals, she asks her mother when she has questions and otherwise searches on the internet to find the answers.
		''If my mother cannot give me an answers …. I search on internet if I can find my question there''	
		''I ask my mother, because the has a lot of experience''	
Health needs	Confirmation	'' This is my first child and I have a lot of questions how to do some things''	Because this is her first child, she has a lot of questions and desperately wants confirmation about if she is doing it right.
		'' questions with only one answers, but still I want the confirmation''	

Technical specifics

Interview segment	The group with one child	Sample quote	Translation to persona
Access social media	Mobile phone, laptop, tablet	'' Ten times a day I use the IPad''	Roza has access to a mobile phone, laptop and tablet with internet. She uses the Ipad more than ten times a day.
Which situation use the eHealth technology	Make/change appointment and questions	''For changing appointments I will use it''	Roza is going to use the current eHealth technology for changing appointments or when she has questions about eating and sleeping.
		'' For all my questions.. I can maybe use it''	
		'' when I have a questions about eating and sleeping I can check this and ask question.''	
Expectations eHealth	Mobile application	'' Mobile application is better for me, because I cannot use my laptop because of the internet problems. I have good internet on my mobile phone, so that is better for me.''	She likes to have a mobile application as eHealth technology, because she thinks it fast, easy and accessible everywhere.
		'' I like an application, because you can open it fast and easy on the couch''	
Requirements eHealth technology	Easy to understand and reliable information	'' something like this is more reliable than google''	For Roza, important eHealth requirements are reliable information, being able to understand the technology and support for different languages.
		'' that I can understand it better in my language''	

Appendix 6: Overview health and technical specifics persona 2

Health specifics

Interview segment	The group with one child	Sample quote	Translation to persona
Information sources	The child health professionals and teacher	''If I have doubts about certain things, I ask the child health professional''	When Carola has questions about her youngest child, she contacts the child health professionals. When she has question for her two older children, she asks their teacher.
		'' If I think it is important I ask the child health nurse''	
		'' If I have questions for my two oldest children, I often ask the teacher''	
Health needs	Extra information and tips	'' I like to get more information about my child''	This is her third child, so she already knows a lot about children and the most common problems. Still, Carola likes to get extra information about enuresis of her older son.
		'' this is my third child, so you know already more than by your first child''	
		'' I like to have extra tips about enuresis of my older son''	

Technical specifics

Interview segment	The group with one child	Sample quote	Translation to persona
Access social media	Mobile phone, laptop, tablet	'' For my work I often use internet, to plan everything and mail''	Carola has access to a mobile phone, laptop and tablet. For her work she uses internet for mailing.
Which situation use the eHealth technology	Ask question, get tips and make/change appointments	''.. if I have question about health''	She will use an eHealth technology when she has questions or wants extra information and for making or changing appointment.
		'' checking if they have tips for sleeping''	
		'' I will use it for changing appointments''	
Expectations eHealth	Website	'' I like to get information by a website''	Carola likes to use a website to get information about her child.
Requirements eHealth technology	Privacy and a clear overview	'' Privacy is important.., because this are data about my child. Not everybody have to see this.''	For Carola, important eHealth requirements are privacy and a clear overview of all the information. She does not like it when everybody is able to access the information about her child and she does not want to search for hours to find the correct information.
		'' When I use a website, I do not want to search for hours…''	