International Practice Development Journal

Online journal of FoNS in association with the IPDC and PcP-ICoP (ISSN 2046-9292)

ORIGINAL ARTICLE

Starting conversations about intimacy and sexuality: designing a tool for healthcare professionals and older adults in long-term care

Sonja van der Sluis*, Harmieke van Os-Medendorp, Karin Voortman-Overbeek, Ingrid Buwalda, Marjolein E.M. Den Ouden, Noëlle Sant, Jos Thalen and Jan S. Jukema

*Corresponding author: Saxion University of Applied Sciences, Deventer, Netherlands
Email: s.g.vandersluis@saxion.nl

Submitted for publication: 20th January 2023
Accepted for publication: 28th April 2023
Published: 24th May 2023
https://doi.org/10.19043/ipdj.131.005

Abstract
Background: Intimacy and sexuality are essential aspects of quality of life for older adults in long-term care. Numerous tools and interventions are available to support healthcare professionals in their conversations about intimacy and sexuality but they are often unfamiliar with these, or do not know when or how to use them.
Aim: To develop a tool to help healthcare professionals choose from existing interventions to facilitate conversations with older adults on the subject of intimacy and sexuality.
Methods: A design study, comprising five substudies and 16 workshops, was carried out in inpatient and outpatient settings for older adults. Participants were healthcare and design professionals, older adults and their relatives, undergraduate students and researchers. Data collection and analysis took place in several iterations, with insights from one phase guiding the design of the next.
Findings: A paper brochure and a digital knowledge programme (IntiME) was developed to inform the selection of interventions and tools to initiate conversations about intimacy and sexuality with older adults. Initial experiences with IntiME suggest it can support healthcare professionals in this area.
Conclusions: The IntiME tool has the potential to improve person-centred care around intimacy and sexuality by matching the personal characteristics of healthcare professionals and older adults with available interventions and tools. Further research into experiences with the use of IntiME is warranted.
Implications for practice:

- IntiME has the potential to improve person-centred care by matching the personal characteristics of staff and older adults with available interventions and tools
- Co-creation with older adults and staff plays an important part in designing tools for person-centred care
- Using IntiME may help staff become more aware of their own needs and thereby enhance competence in conversations about intimacy and sexuality

Keywords: Intimacy and sexuality, older adults, design thinking, person-centred care, conversations

Introduction

Intimacy and sexuality are important aspects of quality of life and are basic human needs (WHO 2018; McCann et al., 2018). Sexuality is defined by the World Health Organization (2018) as:

> *'A central aspect of being human throughout life and encompasses sex, gender identities and roles, sexual orientation, eroticism, pleasure, intimacy, and reproduction. Sexuality is experienced and expressed in thoughts, fantasies, desires, beliefs, attitudes, values, behaviours, practices, roles and relationships.'*

Previous research has shown that older adults (65 years and older) value intimacy, remain sexually interested and can enjoy an active sex life (Aguilar, 2017). On the other hand, age-related complaints and long-term conditions can have an adverse impact in this respect (Lindau et al., 2007; Mahieu and Gastmans, 2015; Jannini and Nappi, 2018). However, despite its ongoing importance, the subject is seldom discussed by healthcare professionals in long-term care (Mahieu and Gastmans, 2015; Wilschut et al., 2021) .

Older adults, their relatives and healthcare professionals experience barriers to addressing intimacy and sexuality, such as stigma, patients' age, time pressures and organisational support (Klaeson et al., 2017; Fennell and Grant, 2019). In addition to the perceived barriers, knowledge, attitudes and beliefs, and the extent to which nurses are comfortable talking about intimacy and sexuality are important factors (Fennell and Grant, 2019). As a result, the wishes and needs of individuals may not be addressed (Haesler et al., 2016; Messelis et al., 2019; Messelis and Bauer, 2020). A higher level of knowledge, higher age and additional training of staff are associated with a more positive attitude towards addressing sexuality (Bauer et al., 2013; Mahieu et al., 2016), although a gap remains between such a positive attitude and initiating discussion on this topic with older adults (Haesler et al., 2016). From a nursing perspective, nurses have a responsibility to provide person-centred care that helps older adults to flourish, including in the often very private domain of intimacy and sexuality (McCormack and McCance, 2016). Person-centred care prioritises the personhood of those cared for, respecting their uniqueness, values and beliefs on life, health and care (McCormack and McCance, 2016). This is central to the relational understanding of care. Person-centred care also acknowledges the influence of contextual factors on the content and form of care in specific situations (McCormack and McCance, 2016).

Numerous conversation aids and interventions are available to support healthcare professionals in their conversations about intimacy and sexuality, in the form of e-learning, assessment tools and workshops (White, 1982; Bauer et al., 2014; Omole et al., 2014). However, staff are often unfamiliar with these interventions or do not know when and how to use them in practice (Evcili and Demirel, 2018). For that reason, rather than new tools or interventions, staff need a tool to help them select from those that are already available.

Aim

This study seeks to contribute to optimising person-centred care for older adults in long-term care in the area of intimacy and sexuality, by honouring the relational and contextual nature of person-centred care, which aims to help older adults flourish. Hence, the aim of this design study is to develop a tool to inform the selection of an appropriate intervention or tool to initiate conversations on the subject. This tool will consider the personal approaches of professionals, the characteristics of the long-term care context, the uniqueness of older adults, and available interventions to address these conversations on intimacy and sexuality.

Method

Design

A design-based research method taking the design thinking approach was used (Meinel and Leifer,

2015). Design-based research is particularly useful in solving complex problems by developing innovations from the perspective of human needs. The five iterative phases of design thinking were followed (Meinel and Leifer, 2015; Roberts et al., 2016; Altman et al., 2018):

- **Phase 1: Empathise** aimed to explore experiences of conversations about intimacy and sexuality, and to gain insight into the perceived usefulness of available interventions
- **Phase 2: Define** aimed to develop and evaluate different personas based on users' needs and issues
- **Phase 3: Ideate** aimed to generate ideas for a tool to find suitable interventions in long-term care for older adults
- **Phase 4: Prototype** saw three prototypes developed
- **Phase 5: Test** saw the three prototypes tested for ease of use by end users

This study encompasses these five phases across five substudies and 16 workshops, using various co-creation and discussion methods involving the active engagement of healthcare professionals and older adults as potential end users. Mixed methods were used for data collection (Table 1, page 4). The study as a whole was carried out in a long-term care organisation providing nursing home care and home healthcare for older adults in the eastern Netherlands. It took place between September 2019 and September 2022, at the time of the Covid-19 pandemic.

Participants

The study was carried out by a project group consisting of: four researchers with a background in nursing, industrial design and healthcare technology; a manager of the healthcare organisation; two members of the clients' board, representing older adults; an expert from a national knowledge centre; representatives from a design agency and from a company producing e-tools for professional communication; and a senior lecturer from a school for secondary vocational education. The participants of the different substudies and workshops included: older adults (or representatives) and their relatives; healthcare professionals including nurses; undergraduates from a variety of degree programmes, including nursing, industrial design and social work; and experts in domains such as design, personalised care for older adults, intimacy and sexuality. Participants were recruited and selected by researchers and members of the project group. Researchers contacted older adults nominated by a healthcare professional, provided information and requested informed consent. Inclusion criteria for older adults were: receiving long-term care at home or in a nursing home; ability to talk about personal needs regarding intimacy and sexuality, fluency in Dutch, and legal competence (assessed by physician and indicated in the dossier of the older adult). No exclusion criteria were applicable.

Data collection and analyses

In this design study data were collected and analysed through five substudies and various workshops (Table 1). To improve the quality of the analysis, data collection and analysis were approached as an iterative process, member checks with end users were done and field notes were used.

Ethics

Participation in the study was voluntary. All participants were carefully informed about project purposes and provided informed consent in each substudy. All statements by participants have been handled anonymously and appropriately. Given the sensitivity of the information, respondents could fill in questionnaires anonymously. The Medical Ethics Committee Twente ruled that the Medical Research Involving Human Subjects Act (1999) did not apply to this study.

Findings

Every phase of this design study consists of substudies and/or workshops, each of which produced its own results. These results have been combined in the final result, namely the IntiME tool, to inform the selection and use of appropriate interventions to initiate conversations about intimacy and sexuality with older adults in long-term care.

Table 1: Design phases, substudies and workshops

PHASE 1: EMPATHISE

Overall aim: To explore experiences of conversations about intimacy and sexuality and to gain insight into perceived usefulness of relevant available interventions

Substudy	Participants	Objective	Data collection	Analysis
1 Design: survey	• Older adults (n=78)	To gain insight into the frequency and satisfaction of conversations about intimacy and sexuality between older adults and HCPs	Questionnaire regarding conversations on intimacy and sexuality between older adults and HCPs	SPSS, descriptive statistics
2 Design: descriptive qualitative study	• Older adults (n=11) • Close relatives (n=5) • HCPs (n=9) • Students (n=2)*	To get to know the needs and wishes in conversations about intimacy and sexuality	Semi-structured interviews regarding needs and wishes, and support needs	Thematic analysis (Braun and Clarke, 2006

Workshops
Two workshops were held. The first focused on desk research where students (n=2)*, researchers and designers (n=3) completed a list of all available Dutch interventions. The second took place at a national geriatric conference, where HCPs (n=57) shared their experiences and views on the effectiveness and usability of a set of Dutch interventions, via a questionnaire. A discussion was also held on whether there were any interventions or tools that were missing.

PHASE 2: DEFINE

Overall aim: To develop and evaluate personas of potential users

Substudy	Participants	Objective	Data collection	Analysis
3 Design: survey	• HCPs (n=27) • Students (n=13)*	To create personas and to gain insight in the recognisability of these personas	Self-developed questionnaires	Qualitative data analysis by coding answers on open questions

Workshops
The results of Phase 1 served as the basis for discussions and analyses in five consecutive workshops. Various stakeholders** participated: close relatives of the older adults (n=52); HCPs (n=73); and researchers and designers (n=25). Based on these workshops, personas were developed for older adults and HCPs, which were discussed and evaluated for recognisability. The influence and meaning of organisational factors on discussions of issues related to intimacy and sexuality were also considered. The use of personas in the tool as part of the healthcare process was also discussed

PHASE 3: IDEATE

Overall aim: To generate ideas for a tool to find suitable interventions in long-term care for older adults

Substudy	None

Workshops
During two workshops, participants worked on generating ideas for requirements and solutions that could be used as tools in different settings. Participants were HCPs (n=2), a student, a relative of an older adult, and researchers and designers (n=13)

PHASE 4: PROTOTYPE

Overall aim: To develop prototypes for the chosen form of the tool

Substudy	None

Workshops
During five workshops, researchers and designers (n=4) worked with a diverse group of close relatives of older adults (n=4), HCPs (n=8) and students (n=13)*, to develop prototypes for the selected tool. Workshops focused specifically on the role of the personas in the selected tool, and 14 available interventions were discussed

PHASE 5: TEST

Overall aim: To test the three prototypes for user-friendliness by end users

Substudy	Participants	Objective	Data collection	Analysis
4 Design: survey	• HCPs (n=10) • Students (n=10)*	To gain insight into the usability of the tool and expressed preferences for its design	Questionnaire based on System Usability Scale (Brooke, 1995) regarding experiences of using three types of the selection tool, preferences of HCP and recommendation of HCP for older adult	Descriptive statistics
5 Design: descriptive qualitative study	• HCPs (n=6) • A student*	To gain insight into the experiences of using the selection tool	Semi-structured interviews on general experiences regarding intimacy and sexuality and experiences in using the tool such as 'How do you feel when using this product?'	Qualitative data analysis by coding open answers

Workshops
In two workshops, three tool prototypes were demonstrated to students and experiences with its use were shared by students (n=8)*, a close relative, HCPs (n=2) and researchers and designers (n=8)

** Students were diploma of nursing students, bachelor of nursing students, or a mix from different bachelor programmes, working in interdisciplinary teams*
***Some stakeholders participated in different workshops*

From phase 1, **Empathise**, it became clear that talking about intimacy and sexuality is dependent on a trusting relationship, the skills of staff, consultation with colleagues, and personal factors and barriers, and also that existing and available interventions are not known or used by staff and older adults. Therefore, in phase 2, **Define**, it was decided to develop a tool to find available interventions, tailored to the characteristics of the users. This would include different personas, based on personal attitudes, wishes and needs and what is helpful in initiating a conversation about intimacy and sexuality. This resulted in four personas for older adults and four for healthcare professionals. In phase 3, **Ideate**, it transpired that a digital quiz was the preferred approach, and in phase 4, **Prototype**, three prototypes of this quiz were developed. In these prototypes, interventions were matched with personas as a starting point in the selection of relevant interventions. In phase 5, **Test**, the prototypes were tested for usability and user experience, which led to two prototypes being recommended. The final choice, the IntiME tool, consists of a paper brochure and a web-based digital knowledge programme.

Phase 1: Empathise

Survey

In total 78/901 (8.3%) of older adults receiving care from the healthcare organisation partially completed the survey. Of these, 85% (60/70) indicated that intimacy and sexuality was never a topic of conversation between them and staff, and 46% (35/76) indicated that they never wanted to discuss intimacy and sexuality with staff. Of the 13 older adults who responded to the question 'Who initiated conversations about intimacy and sexuality?', four reported 'myself', one 'my partner', two 'a family member', two 'a caregiver' and four reported 'another'. Ten of the 13 gave a median score of 8 on a Likert scale from 0 to 10 in response to the question asking how satisfied they were with the content of the conversation.

Qualitative study

Three themes emerged from the interviews reflecting the varying experiences of older adults and staff regarding conversations in the domain of intimacy and sexuality:

1. Needs and wishes in conversations
2. What helps to start a conversation
3. Barriers to starting a conversation

1. Needs and wishes in conversations

Both older adults and staff indicated they needed to trust each other in order to have an open conversation. How a comfortable and trusting relationship was developed depended on the personality and openness of both.

> *'You can tell quickly enough whether older adults are open to discussing things with you that they might not otherwise discuss with others'* (Healthcare professional).

Healthcare professionals need skills to help understand who the older adult is as a unique person and what such a conversation can evoke in that person. For example, who you can joke with about intimacy and sexuality. In addition, interventions to support staff in conversations about intimacy and sexuality were needed:

> *'That the caregivers have certain interventions at their disposal: okay, we have a specific protocol for this, these are the steps we can take'* (Relative).

Some staff saw consultation with colleagues as an opportunity to discuss a difficult situation, to see how it could be handled and to discuss who would start the conversation.

> *'Maybe just ask your colleagues, how would you do it? Or, can I maybe practise with you? Or, I think it's mainly that not everyone dares to be seen as vulnerable. I think that's where the problem lies. And yes, maybe it's also a subject that could come up during a work meeting or something like that'* (Healthcare professional).

2. What helps to start a conversation?
Some healthcare professionals suggested using a new patient's intake interview as a starting point for the conversation about intimacy and sexuality. On the other hand, talking about intimacy and sexuality with an older adult worked best as part of a daily, natural conversation without becoming a component on paper or a checklist – a daily conversation as natural as talking about other aspects of daily life:

> *'And that it is such a taboo, while it is just like eating and drinking, a part of life'* (Older adult).

During the care process, signals from the older adult such as loneliness and positive experiences with intimacy and sexuality helped staff to start the conversation. Some older adults and their loved ones indicated that it would help them if staff started the conversation, while some staff members believed the older adults and their loved ones should initiate the conversation.

Humour was mentioned as a potentially good starting point for a conversation about intimacy and sexuality. As one healthcare professional stated:

> *'I use a lot of humour. Humour is timeless, no matter how old you are, you can achieve a lot with it'* (Healthcare professional).

In addition, staff reflected on their own needs in intimacy and sexuality, to help put themselves in the position of the older adult.

> *'I hope that when my partner is ill, I will have the opportunity to lie close to him. And maybe it also has to do with the fact that I like the physical contact with my partner. That he takes me in his arms or gives me a kiss or puts his arm around me. So maybe that comes from my own need'* (Healthcare professional).

3. Barriers to starting a conversation
Staff's personal characteristics, such as uncertainty and age difference with the older adults, were regarded as barriers to conversations.

> *'I really think that we are still dealing with the generation that just doesn't talk about it, they are just not used to talking about it. I think that will change, but of course it also has to do with your own upbringing and how you are and how open you are'* (Healthcare professional).

Some older adults as well as older staff indicated they had not grown up with the idea of talking about intimacy and sexuality, which hindered conversation about their needs.

> *'In our home, this was never discussed, so I think that is one of the reasons why it is more difficult for me to talk about it. I am of course part of an older generation'* (Healthcare professional).

In this phase, two workshops took place. In the first, the researchers selected 14 interventions from 44 available Dutch-language interventions and tools. In the second, the 14 interventions were presented to staff, older adults and their caregivers. Participants indicated that these interventions were never or almost never used in practice and/or could not be found by the healthcare professionals. In addition, the usefulness of these 14 interventions were evaluated. Numbers 13 and 14 were rated as not useful by a high number of healthcare professionals and were therefore excluded from further consideration.

At a later stage in the design process, in the Prototype phase, intervention 5 was ultimately assessed as not being meaningful for tool development because it is primarily meant for use in empirical research. Interventions 15, 16 and 17 were supplemented by an expert in the field of competence development in intimacy and sexuality care for older adults. Thus, a total of 14 interventions were finally rated as useful for starting a conversation regarding intimacy and sexuality (see Box 1).

Table 2: Usefulness of the interventions and relevance of matching the intervention to the persona

Usefulness of the interventions			**Relevance of matching intervention to persona**							
Healthcare professionals (HCP) n=62 Representatives of older adults (RoA) n=7			Persona HCP				Persona older adult			
Intervention	Useful*	Not useful*	Roy	Esra	Astrid	Kelly	Magriet	Marie-Louise	Hendrik	Jacob
1. Dance workshop: 'Skin Hunger'	HCP:37 RoA:4	HCP:12 RoA:0	✓	✓	×	×	✓	✓	×	×
2. Sex kit: suitcase filled with information on help available in the field of sexuality	HCP:21 RoA:0	HCP:30 RoA:3	✓	✓	✓	✓	×	×	×	×
3. Intimacy leaflet to support discussion	HCP:50 RoA:3	HCP:12 RoA:0	✓	✓	✓	✓	✓	✓	✓	✓
4. E-learning: supporting LGBT older people	HCP:45 RoA:2	HCP:5 RoA:0	✓	✓	✓	✓	✓	✓	✓	✓
5. Aging Sexual Knowledge and Attitudes Scale (ASKAS)**	HCP:31 RoA:0	HCP:15 RoA:3	✓	✓	×	×	✓	✓	×	×
6. Stimulating statements	HCP:45 RoA:6	HCP:0 RoA:1	✓	✓	✓	✓	✓	✓	✓	✓
7. Training folder: intimacy and sexuality in care for older adults	HCP:41 RoA:2	HCP:7 RoA :1	✓	✓	✓	✓	✓	✓	✓	✓
8.Documentary: *69: Love Sex Senior*	HCP:30 RoA:2	HCP:17 RoA:1	✓	✓	✓	✓	✓	✓	✓	✓
9. Photo cards	HCP:47 RoA:3	HCP:5 RoA:0	✓	✓	✓	✓	✓	✓	✓	✓
10. Videos: discussing intimacy and sexuality	HCP:39 RoA:3	HCP:7 RoA:0	✓	✓	✓	✓	✓	✓	✓	✓
11. Permission, limited information, specific suggestions, and intensive therapy model (PLISSIT) model	HCP:22 RoA:3	1HCP:27 RoA:0	✓	×	×	×	✓	×	×	×
12. Geriatric Sexuality Inventory (GSI)	HCP:32 RoA:2	HCP:13 RoA:1	✓	×	×	×	✓	×	×	×
13. SexQuartet card game	HCP:14 RoA:1	HCP:33 RoA:2	Excluded from further consideration							
14. Dialogue trainer: The Practice Doctor	HCP:12 RoA:2	HCP:29 RoA:4	Excluded from further consideration							
15. Videos on intimacy and sexuality: case studies	Not included in assessment of usefulness		✓	✓	✓	✓	✓	✓	✓	✓
16. Inteam board game	Not included in assessment of usefulness		✓	✓	×	✓	✓	✓	×	✓
17. Free e-learning: intimacy and sexuality in the nursing home	Not included in assessment of usefulness		✓	×	✓	✓	✓	×	✓	✓

**Not all HCPs or RoAs commented on all interventions* ***Intervention 5 was later excluded*

Box 1: Final selection of 14 interventions

1. Dance workshop: 'Skin Hunger'
2. Sex kit
3. Intimacy leaflet
4. E-learning supporting LGBT adults
5. Stimulating statements
6. Training folder: intimacy and sexuality in care for older adults
7. Documentary: 69: Love Sex Senior
8. Photo cards
9. Videos: discussing intimacy and sexuality
10. Permission, limited information, specific suggestions, and intensive therapy model (PLISSIT) model
11. Geriatric Sexuality Inventory (GSI)
12. Videos on intimacy and sexuality: case studies
13. Inteam board game
14. Free e-learning: intimacy and sexuality in the nursing home

Phase 2: Define

It was decided to develop a tool to inform the selection of interventions to support a conversation about intimacy and sexuality. Key elements of this tool are the personas and the interventions. Pictures of personas were created by a designer. Close relatives of older adults, healthcare professionals, researchers and designers were involved in the development of the personas (Table 1). The personas represent different types of staff and older adults, based on the following criteria:

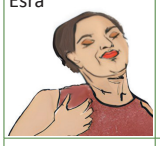
- Needs and wishes in a conversation
- Attitudes regarding conversation
- Factors including gender, age, cultural background, residential area and marital status

Seven personas were created. An eighth was added to represent a person who does not want to talk about intimacy and sexuality (Table 3). This persona was developed as it was assumed that due to non-response bias, staff who did not want to talk about intimacy and sexuality would not participate in this project.

Based on Substudy 3 (Table 1), five personas were adapted in detail. For example, the word 'taboo' was substituted by 'difficult subject' in the persona Hendrik. Participants stated that all personas were recognisable and representative of the range of personalities of both older adults and professionals. No representation of a personality was missing.

HCPs indicated that the use of personas of older adults could prove to be too stereotyped, and were therefore quite hesitant to use them. Therefore, this led to the explicit recommendation to give the personas a supportive place in the envisioned final product and not as starting point of the selection process.

Table 3: Needs, wishes and attitudes regarding conversations about intimacy and sexuality

Persona	Personal characteristics	Needs and wishes in conversations about intimacy and sexuality	Attitudes regarding conversations about intimacy and sexuality
Older adults			
Magriet 	78-year-old widow. Independent personality, lives in an apartment in a nursing home and receives homecare	No needs or wishes	Finds it easy to talk about; it is like eating and drinking
Marie-Louise 	86-year-old widow. Independent personality, receives homecare	Needs mutual trust	Waits until the care professional initiates the conversation
Hendrik 	87-year-old widower. Had a very happy marriage, has a girlfriend, lives in an apartment in a residential care home	Talks with his girlfriend about intimacy and sexuality, makes jokes with HCPs to avoid the subject	Does not want the professional to start the conversation
Jacob 	67 years old. Feels lonely, no relationship, lives in a nursing home	Needs small talk and personal attention	Avoids the topic, does not dare to talk about personal topics
Healthcare professionals			
Roy 	Open personality	Discusses complicated situations in the intimacy and sexuality domain with colleagues	Talks easily, it is a human need just like eating and drinking
Esra 	Between open and closed personality	Needs structure such as an intake interview to start a conversation, needs support of a colleague in order to have a conversation with her client	Wants to talk but does not do it by herself, feels uncomfortable
Kelly 	Open personality	Needs a reason (within the team) or signal within the team or of the older adult	Can talk but it is difficult for her, she does not know how to start the conversation, talks about it when she has to, or when the client starts the conversation
Astrid 	Closed personality	No needs or wishes	Does not want to talk about the subject and does not talk about it; it is a private matter for the older adults concerned

Phase 3: Ideate

Three different ideas on the possible tool emerged: a team game, an interactive group game and a digital quiz. There were three possible settings: a group setting, a one-to-one setting with a healthcare professional and older adult, and a team setting with only staff. Based on a structured discussion about usability and functionality, the idea of a digital quiz on a tablet device, conducted in a one-to-one setting was preferred as this could be used in formal and informal settings, for homecare as well as in nursing homes, and involved both professional and older adult. The digital quiz was further elaborated using a storyboard, with the aim of obtaining more details on its content and use. Staff indicated for example that the quiz should take about 10 minutes to complete, that it could be done either together or by the older person on their own, and that privacy must be guaranteed. Also discussed was exactly how the use of this tool could lead to a conversation about intimacy and sexuality.

Phase 4: Prototype

We developed three prototype tools (Table 4):

- **'Avatar':** a digital quiz with an avatar asking questions and providing answers
- **'I hardly dare to ask':** a game in which real actors pretended to be one of the personas with a set of recorded questions and answers. After the game the user can click on one person with whom they feel the best match
- **'Intimate':** a digital quiz with questions and answers

Using these prototypes, staff were asked to answer eight questions relating to intimacy and sexuality, and older adults were asked 10 questions. The responses led to the selection of a persona (Table 3) which subsequently led to the selection of appropriate interventions (Table 2).

Examples:

Question to healthcare professional: 'Is it important for you to discuss intimacy and sexuality openly with older adults?'
Response: 'I think that it is important but I would rather that someone else does it.'
Based on the response, the healthcare professional is allocated the persona of nurse Esra.

Question to older adult: 'Does a person need warmth and to be touched?'
Response: 'That is private.'
Based on the response, the older adult is allocated the persona of Hendrik.

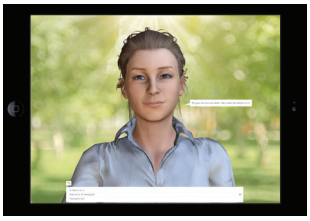
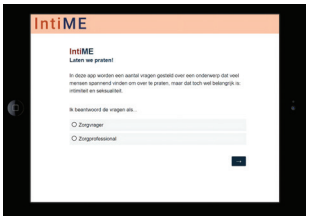
A similar process applies to the older adults, with advice given for a suitable intervention based on the persona most frequently chosen by the older adult and the healthcare professional. For example, the intervention 'Sex kit'– a suitcase filled with information about the help on offer in the field of sexuality – is particularly suited to the open personality of the healthcare professional persona Kelly, or the dance workshop 'Skin Hunger' might be suitable for the older adult Margriet, who easily talks about intimacy and sexuality.

Once that match has been made, the tool can give a specific persona advice on making a choice from the available interventions. Thus, a list of 14 interventions served as starting point for conversation regarding intimacy and sexuality (Box 1).

Phase 5: Test

Experiences of the three prototypes of tool regarding usability, and different aspects including content and form, technology and interaction are described in Table 4.

Table 4: Experiences of using the three prototypes

	Avatar	**I hardly dare to ask**	**Intimate**
			
Usability total score based on System Usability Scale (Brooke, 1996)	63.7 (moderate)	74.9 (good)	75.1 (good)
Preferences of HCPs (n=20)	n=8	n=4	n=8
Recommended by HCPs (n=20) for older adults' use	n=8	n=4	n=8
Average testing time	6.30 minutes	11.30 minutes	2.40 minutes
Content and form	Good balance between reality and fiction, nice voice, good combination of audio and text, small font	Credible/recognisable characters, long and tedious	Does not appeal, too static, boring, lots of text
Use and function	Good length of time, concise, nice middle ground, simple, easy to use	Unclear process, missing numbering	Does not suit the older adult, missing audio
Technology	Picture and sound are not equal (irritating), log-in process is cumbersome	Start button unclear, code at the end cumbersome	No problems
Content of questions and answers	Clear, perhaps more in-depth questions	Answers are predictable	Lacks depth
Interaction	Interaction is fine, funny, attractive, friendly, kind	Humorous, actors are predictable, able to identify with, difficult to identify man-woman, when a person is chosen they are followed during the test	Fast or even too fast, misses depth
Advised intervention	Advice unclear	Incorrect advice	Mixed opinions, advice was suitable or unsuitable

Based on the feedback on the different elements listed in the first column of Table 4, which provide insight into the experiences of using the three prototypes, we can state that healthcare professionals and students preferred the two interactive tools 'Avatar' and 'I hardly dare to ask', believing they helped start a conversation with the older adults. Experiences of using the interactive tools were generally positive, although 'Avatar' was evaluated as moderate due to technical limitations and the fact that it did not always meet expectations of clients.

> *'My client expected Avatar to be different, she thought it would be more about, say, lesbian or gay people and transgender people' (*Healthcare professional).

The rather direct questionnaire 'Intimate' was experienced as quick and good, but as rather superficial; an example is the question for older adults: 'A human being needs warmth and to be touched'. Staff gave mixed opinions regarding the suitability of the recommended interventions: six out of 20 considered the advised intervention as suitable, the others considered them to be less suitable or unsuitable, and some did not follow up the recommendation. They indicated that they would have liked an introduction and follow-up on the use of the tool. So, it was decided to develop a knowledge programme as a component of the tool.

The IntiME selection tool

Based on the results of phases 1 to 5, we developed a tool to inform the selection of an appropriate intervention. This tool, named IntiME, was informed by suggestions from healthcare professionals in the Test phase, and consists of a paper brochure and a web-based digital knowledge programme (Table 5).

Table 5: The IntiME selection tool*

Component	Features
Brochure	• Introduction to the subject of intimacy and sexuality • Five-step manual on how to use IntiME: 1. The healthcare professional looks at the personas 2. They determine which persona they and the older adult most identify with 3. Three interventions are recommended that could support a conversation 4. Tips for starting the conversation 5. Websites and references for conversation aids, including QR codes that lead to more information about the interventions • Photo cards as conversation aids
Web-based knowledge programme (dialoguetrainer.com/intime)	• An introduction to the topic of initiating conversations about intimacy and sexuality • Influencing factors • Knowledge quiz • An individual self-assessment for the HCP, in which their personal characteristics (based on the personas) lead to a recommendation of three of the existing conversation aids • A conversation simulation • A self-assessment for the older adult (with or without support), initiated by the HCP, in which the older adult's personal characteristics (based on the personas) lead to a recommendation of three conversation aids • Reflection • Feedback on the results in the team and keeping the topic on the agenda

**Measures were taken in the programme to ensure the privacy of users*

Discussion

The main outcome of this study is a tool, IntiME, for use by healthcare staff working in long-term care with older adults. It aims to inform their selection and use of appropriate interventions to help initiate a conversation about intimacy and sexuality with the older adults. We showed that although older adults and staff in long-term care regard talking about intimacy and sexuality as important, they rarely broach the subject and half of them never want to talk about it. The relevance of such conversations has been demonstrated in previous research (Frankowiski and Clark, 2009; Bauer et al., 2014; Mahieu et al., 2016; Cook et al., 2017; Roelofs et al., 2021), but staff and older adults experience barriers due to personal attitudes or a lack of skills. Research has confirmed that the attitude and skills of nurses influence if and how intimacy and sexuality is discussed (Klaeson et al., 2017; Wilschut et al, 2021). Furthermore, we find that a trusting relationship between an older adult and healthcare professional is a prerequisite, and this is also reported by Bauer and colleagues (2016). In practice staff lack a person-centred approach and too often focus on functional care, which hinders older adults' expression of intimacy and sexuality (Cook et al., 2017, 2021). We therefore chose to develop a tool that not only helps staff find appropriate interventions, but also makes recommendations based on the personal preferences of the healthcare professional and the older adult.

To acknowledge the uniqueness of both, personas were developed based on needs and wishes in a conversation, attitudes regarding conversation and personality, in a careful process involving various workshops and evaluations. Personas are defined as representative 'characters' of end users (White and Devitt, 2021) and deployed in user-centred design and in the development of mobile health tools (Haldane et al., 2019; Voorheis et al., 2022). The steps followed in our study are in line with those described by Cooper (cited by White and Devitt, 2021) and our evaluation showed that all personas were recognisable. Two points need further attention. First, little attention has been paid to differences in sexual orientation; the literature shows that demonstrating acceptance of all sexual orientations and gender identities is necessary to create a safe place for everyone (Bauer et al., 2014; Simpson et al., 2017; Fasullo et al., 2022). Additionally, the influence of health problems such as dementia or chronic illness were not further elaborated despite their impact on intimacy and sexuality (Bauer et al., 2014; Roelofs et al. 2021). Second, healthcare professionals experienced personas as stereotyping and were therefore quite hesitant to use them. Negative stereotypes are unfortunately frequently reported regarding intimacy and sexuality in older adults (Sinković et al., 2018). This conflicts with major assumptions, components and dimensions of person-centred care. Therefore, we chose not to use the personas too explicitly in the final tool but only to use them in the background.

The design of our study achieved a high level of end user and stakeholder participation, which improves acceptance and implementation of the final product (Greenhalgh and Abimbola, 2019). Both staff and end users (older adults and those close to them) were actively involved in the interviews and questionnaires in the first phase (Empathise) as well as in workshops and test sessions in later design phases. As a result, the outcome of our design study closely matches requirements and expectations from practice and should therefore be easier to implement.

In line with design thinking methodology, we used various techniques and artefacts to create, visualise and evaluate ideas with end users and stakeholders as early as possible. However, this method was rather time consuming at a time when the Covid-19 response increased workload (Galanis et al., 2021; Hoedl et al., 2022) limiting staff participation. Nevertheless, we managed to organise online co-design sessions using the visual collaboration software Miro, created digital storyboards to discuss future use situations and used digital prototypes to conduct usability tests in the final stage of the design study. Pandemic restrictions also influenced the participation of older adults, and not all older adults were able to participate in online sessions. Therefore, the Test phase was carried out with HCPs and students. User participation is also affected by the topic of the study itself; selection bias could have occurred because those who experience barriers to discussing intimacy and sexuality (Åling et al., 2021) are less likely to volunteer to participate in a research project on that topic. In order not to forget this section of the target group, we created a persona ourselves (in addition to those based on interviews with end users) to reflect healthcare professionals who do not want to discuss the topic.

Interventions tailored to individual staff and older adults can offer meaningful support in achieving a person-centred care approach. Our initial results regarding usefulness revealed that the tool is supportive, and we suggest that its included knowledge base will help staff to use tailored interventions to discuss intimacy and sexuality with older adults (Åling et al., 2021; Horne et al., 2021). The study includes an initial evaluation of the overall concept, featuring the four healthcare professional and four end-user personas and a basic matchmaking matrix, and three user interface alternatives. While this resulted in a positive response from professionals and end users, a formal evaluation and validation of the tool is required to demonstrate its effectiveness.

In addition to such an evaluation, the following suggestions are given for future work. First, although contextual factors are included in the framework of person-centred care (McCormack and McCance, 2016), these have not been sufficiently included in the tool. Research shows that the limited privacy in nursing homes affects the potential for intimate relationships (Cook et al., 2017). Aspects such as small rooms or the absence of locks on doors, also hinder privacy and intimacy (Cook et al., 2021). Further research, particularly with a case-study approach (Paparini et al., 2020), is needed to find out whether and in what way the context of home healthcare or residential care influences the function of the tool.

Also, possible interventions were only searched for in Dutch language databases, which limits the use of the tool outside the Netherlands. Besides, in the current version, interventions were matched in two dimensions – match with staff and match with older adults. The role of a partner was not included, even though data from our Empathise phase concur with other studies in confirming the importance of partners' needs and wishes (Simpson et al., 2017, 2018; Roelofs et al., 2021). A more specified match between intervention, client and partner, and professional could be more supportive.

Conclusion

To conclude, a user-friendly, person-centred tool is now available that can offer healthcare professionals support in starting conversations about intimacy and sexuality with older adults. We suggest this tool will work well in practice. Further research into evidence-based interventions to support conversations concerning needs and wishes regarding intimacy and sexuality, as well as research into experiences with the tool, is needed to determine the best possible fit of interventions.

Implications for practice

The implications of this study for practice are threefold. The tool we developed appears to have the potential to provide person-centred care in the domain of intimacy and sexuality of older adults in long-term care. The results from different iterations of the design process form the basis and content of this tool, which does justice to the specific characteristics of older adults and healthcare professionals, and thus to the relational nature of person-centred care. Next, the use of a design-research methodology and the co-creation approach has led to meaningful results for the development of a person-centred tool. These results can also contribute to a culture of person-centred care since an important characteristic of this design-research methodology is the explicit inclusion of the end-user perspective as well as the contribution of end-users to the development of the final product. This will help develop a culture where diversity is recognised and respected. Finally, we suggest this tool may help professionals and older adults in becoming aware of their own personal needs and barriers in the domain of talking about intimacy and sexuality. This awareness may support more and better conversations about intimacy and sexuality and therefore expand the possibilities of person-centred care through the content of the conversations themselves and the associated care and support.

References

Aguilar, R. (2017) Sexual expression of nursing home residents: systematic review of the literature. *Journal of Nursing Scholarship.* Vol. 49. No. 5. pp 470-477. https://doi.org/10.1111/jnu.12315.

Altman, M., Huang, T. and Breland, J. (2018) Peer reviewed: design thinking in health care. *Preventing Chronic Disease*. Vol. 15. https://doi.org/10.5888/pcd15.180128.

Åling, M., Lindgren, A., Löfall, H. and Okenwa-Emegwa, L. (2021) A scoping review to identify barriers and enabling factors for nurse-patient discussions on sexuality and sexual health. *Nursing Reports*. Vol. 11. No. 2. pp 253-266. https://doi.org/10.3390/nursrep11020025.

Bauer, M., McAuliffe, L., Nay, R. and Chenco, C. (2013) Sexuality in older adults: effect of an education intervention on attitudes and beliefs of residential aged care staff. *Educational Gerontology*. Vol. 39. No. 2. pp 82-91. https://doi.org/10.1080/03601277.2012.682953.

Bauer, M., Fetherstonhaugh, D., Tarzia, L., Nay, R. and Beattie, E. (2014) Supporting residents' expression of sexuality: the initial construction of a sexuality assessment tool for residential aged care facilities. *BMC Geriatrics*. Vol. 14. Article 82. https://doi.org/10.1186/1471-2318-14-82.

Bauer, M., Haesler, E. and Fetherstonhaugh, D. (2016) Let's talk about sex: older people's views on the recognition of sexuality and sexual health in the health-care setting. *Health Expectations*. Vol. 19. No. 6. pp 1237-1250. https://doi.org/10.1111/hex.12418.

Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*. Vol. 3. No. 2. pp 77-101. https://doi.org/10.1191/1478088706qp063oa.

Brooke, J. (1995) *SUS: A Quick and Dirty Usability Scale.* Retrieved from: tinyurl.com/brooke-scale. (Last accessed 26th April 2023).

Cook, C., Schouten, V., Henrickson, M. and McDonald, S. (2017) Ethics, intimacy and sexuality in aged care. *Journal of Advanced Nursing*. Vol. 73. No. 12. pp 3017-3027. https://doi.org/10.1111/jan.13361.

Cook, C., Henrickson, M., Atefi, N., Schouten, V. and McDonald, S. (2021) Iatrogenic loneliness and loss of intimacy in residential care. *Nursing Ethics*. Vol. 28. No. 6. pp 911-923. https://doi.org/10.1177/0969733020983394.

Evcili, F. and Demirel, G. (2018) Patient's sexual health and nursing: a neglected area. *International Journal of Caring Science.* Vol. 11. No. 2. pp 1282-1288. Retrieved from: tinyurl.com/evcili-demirel. (Last accessed 26th April 2023).

Fasullo, K., McIntosh, E., Buchholz, S., Ruppar, T. and Ailey, S. (2022) LGBTQ older adults in long-term care settings: an integrative review to inform best practices. *Clinical Gerontology*. Vol. 45. No. 5. pp 1087-1102. https://doi.org/10.1080/07317115.2021.1947428.

Fennell, R. and Grant, B. (2019) Discussing sexuality in health care: a systematic review. *Journal of Clinical Nursing*. Vol. 28. Nos. 17-18. pp 3065-3076. https://doi.org/https://doi.org/10.1111/jocn.14900.

Frankowski, A. and Clark, L. (2009) Sexuality and intimacy in assisted living: residents' perspectives and experiences. *Sexuality Research and Social Policy Journal*. Vol. 6. No. 4. pp 25-37. https://doi.org/10.1525/srsp.2009.6.4.25.

Galanis, P., Vraka, I., Fragkou, D., Bilali, A. and Kaitelidou, D. (2021) Nurses' burnout and associated risk factors during the COVID-19 pandemic: a systematic review and meta-analysis. *Journal of Advanced Nursing*. Vol. 77. No. 8. pp 3286-3302. https://doi.org/10.1111/jan.14839.

Greenhalgh, T. and Abimbola, S. (2019) The NASSS Framework - a synthesis of multiple theories of technology implementation. *Studies in Health Technologies and Informatics.* Vol. 263. pp 193-204. https://doi.org/10.3233/shti190123.

Haesler, E., Bauer, M. and Fetherstonhaugh, D. (2016) Sexuality, sexual health and older people: a systematic review of research on the knowledge and attitudes of health professionals. *Nurse Education Today*. Vol. 40. pp 57-71. https://doi.org/10.1016/j.nedt.2016.02.012.

Haldane, V., Koh, J.J.K., Srivastava, A., Teo, K.W.Q., Tan, Y.G., Cheng, R.X., Yap, Y.C., Ong, P.-S., Van Dam, R., Foo, J.M., Muller-Riemenschnieider, F., Koh, G.C.-H., Foong, P.S., Perel, P. and Legido-Quigley, H. (2019) User preferences and persona design for an mhealth intervention to support adherence to cardiovascular disease medication in Singapore: a multi-method study. *JMIR mHealth and uHealth*. Vol. 7. No. 5. e10465. https://doi.org/10.2196/10465.

Hoedl, M., Thonhofer, N. and Schoberer, D. (2022) COVID-19 pandemic: burdens on and consequences for nursing home staff. *Journal of Advanced Nursing*. Vol. 78. No. 8. pp 2495-2506. https://doi.org/10.1111/jan.15193.

Horne, M., Youell, J., Brown, L., Simpson, P., Dickinson, T. and Brown-Wilson, C. (2021) A scoping review of education and training resources supporting care home staff in facilitating residents' sexuality, intimacy and relational needs. *Age and Ageing*. Vol. 50. No. 3. pp 758-771. https://doi.org/10.1093/ageing/afab022.

Jannini, E. and Nappi, R. (2018) Couplepause: a new paradigm in treating sexual dysfunction during menopause and andropause. *Sexual Medicine Reviews*. Vol. 6. No. 3. pp 384-395. https://doi.org/10.1016/j.sxmr.2017.11.002.

Kazer, M., Grossman, S., Kerins, G., Kris, A. and Tocchi, C. (2013) Validity and reliability of the geriatric sexuality inventory. *Journal of Gerontological Nursing.* Vol. 39. No. 11. pp 38-45. https://doi.org/10.3928/00989134-20130916-03.

Klaeson, K., Hovlin, L., Guvå, H. and Kjellsdotter, A. (2017) Sexual health in primary health care - a qualitative study of nurses' experiences. *Journal of Clinical Nursing*. Vol. 26. Nos. 11-12. pp 1545-1554. https://doi.org/10.1111/jocn.13454.

Lindau, S.T., Schumm, L.P., Laumann, E., Levinson, W., O'Muircheartaigh, C. and Waite, L. (2007) A study of sexuality and health among older adults in the United States. *New England Journal of Medicine*. Vol. 357. No. 8. pp 762-774. https://doi.org/10.1056/NEJMoa067423.

Mahieu, L. and Gastmans, C. (2015) Older residents' perspectives on aged sexuality in institutionalized elderly care: a systematic literature review. *International Journal of Nursing Studies*. Vol. 52. No. 12. pp 1891-1905. https://doi.org/10.1016/j.ijnurstu.2015.07.007.

Mahieu, L., de Casterlé, B.D., Acke, J., Vandermarliere, H., Van Elssen, K., Fieuws, S. and Gastmans, C. (2016) Nurses' knowledge and attitudes toward aged sexuality in Flemish nursing homes. *Nursing Ethics*. Vol. 23. No. 6. pp 605-623. https://doi.org/10.1177/0969733015580813.

McCann, E., Donohue, G., de Jager, J., van Os, J., Nugter, A., Stewart, J. and Eustace-Cook, J. (2018) Sexuality and intimacy among people with serious mental illness in hospital and community settings: a qualitative systematic review protocol. *JBI Evidence Synthesis*. Vol. 16. No. 2. pp 324-327. https://doi.org/10.11124/jbisrir-2017-003450.

McCormack, B. and McCance, T. (2016) *Person-centred Practice in Nursing and Health Care: Theory and Practice*. West Sussex. John Wiley and Sons.

Meinel, C. and Leifer, L. (2015) Introduction – design thinking is mainly about building innovators. *In* Plattner, H., Meinel, C. and Leifer, L. (Eds.) (2015) *Design Thinking Research. Understanding Innovation*. Cham, Switzerland: Springer. pp 1-11. https://doi.org/10.1007/978-3-319-06823-7_1.

Messelis, E., Kazer, M.W. and Gelmetti, J. (2019) Sexuality, intimacy, and healthy aging. Chp 25 *in* Coll, P. (Ed.) (2019) *Healthy Aging: A Complete Guide to Clinical Management*. Cham, Switzerland: Springer. pp 295-303. https://doi.org/10.1007/978-3-030-06200-2_25.

Messelis, E. and Bauer, M. (2020) Sex and intimacy policy in residential aged care facilities in Flanders, Belgium. *Sexuality and Disability*. Vol. 38. No. 1. pp 85-93. https://doi.org/10.1007/s11195-019-09607-1.

Omole, F., Fresh, E., Sow, C., Lin, J., Taiwo, B. and Nichols, M. (2014) How to discuss sex with elderly patients. *Journal of Family Practice*. Vol. 63. No. 4. E1-E4. PMID: 24905128.

Paparini, S., Green, J., Papoutsi, C., Murdoch, J., Petticrew, M., Greenhalgh, T., Hanckel, B. and Shaw, S. (2020) Case study research for better evaluations of complex interventions: rationale and challenges. *BMC Medicine*. Vol. 18. Article 301. https://doi.org/10.1186/s12916-020-01777-6.

Roberts, J., Fisher, T., Trowbridge, M. and Bent, C. (2016) A design thinking framework for healthcare management and innovation. *Healthcare*. Vol. 4. No. 1. pp 11-14. https://doi.org/https://doi.org/10.1016/j.hjdsi.2015.12.002.

Roelofs, T., Luijkx, K. and Embregts, P. (2021) Love, intimacy and sexuality in residential dementia care: a client perspective. *Clinical Gerontology*. Vol. 44. No. 3. pp 288-298. https://doi.org/10.1080/07317115.2019.1667468.

Simpson, P., Horne, M., Brown, L., Wilson, C., Dickinson, T. and Torkington, K. (2017) Old(er) care home residents and sexual/intimate citizenship. *Ageing and Society*. Vol. 37. No. 2. pp 243-265. https://doi.org/10.1017/s0144686x15001105.

Simpson, P., Wilson, C., Brown, L., Dickinson, T. and Horne, M. (2018) 'We've had our sex life way back': older care home residents, sexuality and intimacy. *Ageing and Society*. Vol. 38. No. 7. pp 1478-1501. https://doi:10.1017/S0144686X17000101.

Sinković, M. and Towler, L. (2019) Sexual aging: a systematic review of qualitative research on the sexuality and sexual health of older adults. *Qualitative Health Research*. Vol. 29. No. 9. pp 1239-1254. https://doi.org/10.1177/1049732318819834.

Voorheis, P., Zhao, A., Kuluski, K., Pham, Q., Scott, T., Sztur, P., Khanna, N., Ibrahim, M. and Petch, J. (2022) Integrating behavioral science and design thinking to develop mobile health interventions: systematic scoping review. *JMIR mHealth uHealth*. Vol 10. No. 3. e35799. https://doi.org/10.2196/35799.

White, C. (1982) A scale for the assessment of attitudes and knowledge regarding sexuality in the aged. *Archives of Sexual Behavior*. Vol. 11. No. 6. pp 491-502. https://doi.org/10.1007/BF01542474.

White, P. and Devitt, F. (2021) Creating personas from design ethnography and grounded theory. *Journal of Usability Studies*. Vol. 16. No. 3. pp 156-178.

Wilschut, V., Pianosi, B., van Os-Medendorp, H., Elzevier, H., Jukema, J. and den Ouden, M. (2021) Knowledge and attitude of nursing students regarding older adults' sexuality: a cross-sectional study. *Nurse Education Today*. Vol. 96. Article 104643. https://doi.org/https://doi.org/10.1016/j.nedt.2020.104643.

World Health Organization (2018) *Defining Sexual Health*. Geneva: WHO. Retrieved from: tinyurl.com/WHO-sexual-health. (Last accessed 14th April 2023).

Acknowledgement

This research was co-funded by Regieorgaan SIA (project RAAK.PUB05.038), part of the Netherlands Organisation for Scientific Research.

Sonja van der Sluis (MSc, RN), Researcher/Lecturer, School of Health, Research Group Smart Health, Saxion University of Applied Sciences, Deventer, Netherlands.

Harmieke van Os-Medendorp (PhD), Associate Professor of Personalised Care, School of Health, Research group Smart Health, Saxion University of Applied Sciences, Enschede, Netherlands.

Karin Voortman-Overbeek (BSc), Researcher, Research Group Industrial Design, Saxion University of Applied Sciences, Enschede, Netherlands.

Ingrid J. Buwalda (MSc), Policy Advisor, Liberein, Enschede, Netherlands.

Marjolein E.M. Den Ouden (PhD), Professor, Research Group Technology, Health and Care, Saxion University of Applied Sciences, Enschede, Netherlands.

Noëlle Sant (MA), Senior Advisor, Vilans, National Centre of Expertise for Long-term Care in the Netherlands, Utrecht, Netherlands.

Jos Thalen (PhD), Associate Professor, Research Group Industrial, Saxion University of Applied Sciences, Enschede, Netherlands.

Jan S. Jukema (PhD), Professor of Personalised Care, School of Health, Research Group Smart Health, Saxion University of Applied Sciences, Enschede, Netherlands.