ORIGINAL ARTICLE

Perceived added value of a decision support App for formal caregivers in community-based dementia care

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Abstract

Aims and objectives: To gain insight into the perceived added value of a decision support App for district nurses and case managers intended to support a problem assessment and the provision of advices on possible solutions to facilitate ageing in place of people with dementia, and to investigate how they would implement the App in daily practice.

Background: District nurses and case managers play an important role in facilitating ageing in place of people with dementia (PwD). Detecting practical problems preventing PwD from living at home and advising on possible solutions is complex and challenging tasks for nurses and case managers. To support them with these tasks, a decision support App was developed.

Methods: A qualitative study using semi-structured interviews was conducted. A photo-elicitation method and an interview guide were used to structure the interviews. The data were analysed according to the principles of content analysis.

Results: In five interviews with seven district nurses and case managers, the added value was described in terms of five themes: (a) providing a broader/better overview of possible solutions; (b) providing a guideline/checklist for problem assessment and advice on solutions; (c) supporting an in-depth problem assessment; (d) being a support tool for unexperienced case managers/district nurses; and (e) providing up-to-date information. The participants regarded the App as complementary to their current work procedure, which they would use in a flexible manner at different stages in the care continuum.

Conclusions: The participants valued both parts, the problem assessment and the overview of possible solutions. An important requisite for the usage would be that the content is continuously updated. Before implementation of the App can be recommended, an evaluation of its effectiveness regarding decision-making should be conducted.

Relevance to clinical practice: This study underpins the need of nurses and case managers for decision support with regard to problem assessment and providing advices on possible solutions to facilitate ageing in place of PwD. There results also show the importance of listening to users experience and their perceived added value of decision support tools as this helps to explain the lack of statistically significant effects on quantitative outcome measure in contrast to a high willingness to use the App in a previous study.

KEYWORDS
case manager, decision support, dementia, nurse

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1 | INTRODUCTION

Formal caregivers in community-based dementia care can play an important role in supporting people with dementia (PwD) and their informal caregivers (defined as family members or friends who provide unpaid care for a person with dementia) in taking deliberate decisions about care and support options (Wolfs et al., 2012). Even though every person who is diagnosed with dementia is different, the disease is typically characterised by an increasing need for care and support and loss of independence (Olazaran et al., 2010; Prince, Prina, & Guerchet, 2013).

People with dementia often experience practical problems in daily life and are particularly susceptible to nursing home admission (Luppa et al., 2010). Research has shown that problems within regard to decreased self-reliance (e.g., inability to conduct ADL activities), safety-related problems (e.g., improper use of electronic devices, wandering) and informal care and network-related problems (e.g., high burden of informal caregivers) are the most important ones preventing PwD from living at home (Thoma-Lürken, Lexis, Bleijlevens, & Hamers, 2018a). At the same time, PwD often wish to continue their life as normal as possible and to live at home for as long as possible (von Kutzleben, Schmid, Halek, Holle, & Bartholomeyczik, 2012). It is very challenging for PwD and their informal caregivers to find the right care and support options to fulfil their needs. Moreover, the care and support services for PwD are often fragmented and continuously new solutions (such as services or technological products) are being developed, which makes it even more difficult to find and decide on the right solutions for the individual situation.

Formal caregivers can advise PwD and their informal caregivers in that process. In the Dutch context, this role is often fulfilled by district nurses and case managers (Alzheimer Nederland & Vilans, 2013; de Bont, van Haaren, Rosendal, & Wijboldus, 2012; MacNeil Vroomen et al., 2012). However, detecting practical problems in the daily life of PwD and advising the right solutions are also complex and challenging tasks for case managers and district nurses. Those tasks of clinical judgement and decision-making are associated with uncertainty. On the one hand, problems may evolve over time and may not be directly visible, and on the other hand, various solutions are available and new solutions are constantly being developed. This makes it challenging for district nurses and case managers to detect the problems and to be always up to date with regard to the available solutions they could recommend. As there is no gold standard describing how to assess the problems and how to advise possible solutions, the clinical judgement and decision-making may strongly depend on the knowledge and expertise of the individual caregiver.

2 | BACKGROUND

Clinical decision support is one method that can be used to support formal caregivers, in this case nurses and case managers, in the complex tasks of clinical judgement and decision-making (Thompson,

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> **What does this paper contribute to the wider global clinical community?**
>
> - District nurses and case managers working in community-based dementia care regard a decision support App combining a problem assessment part with an overview of possible solutions as valuable complement to their current work procedure.
> - The timeliness of information (e.g., possible solutions) provided by a decision support App is regarded as important prerequisite for its usage by district nurses and case managers.
> - Time to familiarise oneself with a new decision support App was regarded as important prerequisite for optimal integration of the App in clinical practice.

Aitken, Doran, & Dowding, 2013). Decision support might increase the confidence of nurses in conducting complex tasks and might also increase the uniformity in clinical judgement, as formal caregivers are advised to assess the same predefined problem domains. One possibility of supporting the judgement and decision-making directly at the point of care is by means of computerised decision support. Computerised clinical decision support can be defined as "providing clinicians (nurses) with computer-generated clinical knowledge and patient-related information, which is intelligently filtered and presented at appropriate times to enhance patient care"(Dunn Lopez et al., 2017, p. 441–442).

A decision support tool for district nurses and case managers could facilitate the complex process of detecting specific problems preventing PwD from living at home, providing advice on possible solutions by guiding them through a problem assessment and providing them with a broad overview of possible solutions. Therefore, a decision support tool in the form of an application (App) for district nurses and case managers in community-based dementia has been developed in close collaboration with these formal caregivers and has been positively tested with regard to its usability (Thoma-Lürken, Lexis, Bleijlevens, & Hamers, 2018b). The aim of the App is to support district nurses and case managers in conducting a problem assessment and the provision of advices on possible solutions to facilitate ageing in place of PwD.

The App runs on an iPad2 and consists of two parts: first a stepwise problem assessment, focusing on the most important practical problems preventing PwD from living at home that were found to be decreased self-reliance, safety-related problems and informal care/network-related problems (Thoma-Lürken, Bleijlevens, Lexis, de Witte, & Hamers, 2018a). The problem assessment is partly based on validated questionnaires, such as the Barthel Index (de Haan et al., 1993) or the Self-perceived Pressure from Informal Care (SPPIC) (Pot, Deeg, van Dyck, & Jonker, 1998) and partly based on self-developed questions. Second, the App contains an overview of possible solutions to deal with the detected problems, such as care and support services,

information sources and assistive technology. This overview is based on information retrieved from, for example, clinical guidelines, databases for assistive technology and expert interviews (Thoma-Lürken, Lexis, Bleijlevens, & Hamers, 2018b).The App can be used by district nurses and case managers in different ways. They can use it for example as guideline to extensively assess the situation of a new client or as a source of inspiration to find new solutions for practical problems of PwD whom they already followed up for a longer period.

In previous studies, this App was tested with regard to its usability and subsequently its efficacy in terms of improved clinical judgement and decision-making in a randomised controlled laboratory experiment. The laboratory experiment yielded contradictory results as neither evidence supporting the App's potential to increase district nurses' and case managers' confidence in conducting a problem assessment and providing advice on possible solutions nor its ability to increase uniformity in problem assessment was found. However, the participants indicated that they were very willing to use the App in daily practice and emphasised its added value in terms providing more insight into the experienced problems of a PwD and providing a broader overview of possible solutions. Additionally, also stakeholders representing the management of long-term care organisations, an insurance company and regional government confirmed the recognised added value of the participants. To decide about further development, subsequent testing and implementation of the App in practice, it is necessary to explore its perceived added value in more detail.

The nature of value can be described as "the degree of becoming better/worse off experienced by the customer (temporally fluctuating)"(Grönroos & Voima, 2013, p. 139). If this description of value is applied to the context of the decision support App, district nurses and case managers are the customers, that is, those who use the App and who perceive themselves to be better/worse off using it. In this study, any aspect describing why district nurses and case managers perceive that the App improves their work is regarded as potential added value. In addition, it is necessary to gain more insight into the way district nurses and case managers would implement the App in their daily practice to estimate how the App relates to their current work procedure and to define whether the App needs to be adapted accordingly.

The aim of this study was to gain insight into the added value of a decision support App as perceived by district nurses and case managers and to investigate how district nurses and case managers aim to implement the App in their daily practice.

3 | METHODS

3.1 | Design

A qualitative study using one focus group interview with about seven participants was planned to gain insight into the perceived added value of a decision support App and perceptions about the possibilities of implementing the App in daily practice. However, due to practical constraints scheduling one focus group interview was not possible; therefore, three individual interviews and two

interviews, in which two or three participants were interviewed simultaneously, were planned.

3.2 | Participants and setting of data collection

All 33 participants (district nurses, case managers or nursing students in the 3rd or 4th year) who were allocated to the intervention group in a previously conducted randomised controlled laboratory experiment (trial register: NTR6167) to study the efficacy of the decision support App were eligible to participate in the study. All of them were invited to participate via email.

The district nurses, case managers and students confirmed their willingness to participate an interview that was planned based on their availability. The interviews took place either in a meeting room at the university or at the workspace of the participants. The interviews lasted between 1 hr–1½ hr.

3.3 | Data collection

The data were collected by means of semi-structured interviews. All interviews were led by an experienced interviewer, the first author (TTL, female, master's degree in public health, PhD candidate). In the first interview, the third author MB, male, PhD in Geriatrics, assistant professor) served as cointerviewer. Before the start of the actual interview, the interviewees were informed about the aim of the study and were given a short recap of the App and the opportunity to test the App for a few minutes. The participants partly knew the interviewer from the prior study, and they were aware of the fact that interviewers were part of the research team which developed the App.

The interview started with a method called photo-elicitation (Dewar, 2012). The participants were asked to select a photograph for the My home life® visual inquiry tool, which according to them best represented the added value of the App for their daily work. The visual inquiry tool contains a set of generic photographs (e.g., of an iceberg, a compass, birds in the air), which can be used to open up a conversation about a person's thoughts about a specific topic (Myhomelife Scotland, 2017). Subsequently, a topic guide with open-ended questions, such as "How would you use the App in daily practice?" or "What is the relationship between the App and your current work procedure?" was used to structure the interview. All interviews were audio-taped with the consent of the participants and afterwards transcribed verbatim. In addition, notes were taken by the interviewer.

3.4 | Data analysis

The data were analysed stepwise and according to the principles of content analysis (Hsieh & Shannon, 2005). Data analysis was conducted using NVivo 10, a computer program for qualitative data analysis (QSR International, 2012). In a first step, the principal researcher (TTL) read-through the transcripts and marked the passages of the text that were relevant for the individual research

questions. The passages were coded according to the main topics reflecting the research questions (added value; usage of the App in practice). A second researcher (MB) checked the coding for one of the interviews to increase the credibility of the results. In case of disagreement, the researchers discussed the topic until consensus was reached. Subsequently, the principal researcher adapted the coding of the other transcripts accordingly.

In the second step, the text passages representing the main themes were read all over again by the principal researcher (TTL). Per topic subcodes were assigned. For the topic added value, the codes were partly derived from the results of the prior study and partly derived from the data. A third researcher (ML) conducted the subcoding procedure for one interview to further increase the credibility of the results. Both researchers compared their coding structure, and in case of disagreement, a discussion took place to reach consensus. The principal researcher added the coding of the other interviews accordingly. Finally, text assigned to each subtheme was summarised and backed with literal quotes, a measure to increase the transferability of the results. The codes assigned to the quotes stand for CM (case manager) or DN (district nurse), the first number indicates the interview (1–5), and the second number stands for the individual participant in the interview.

3.5 | Ethics

No ethics approval was needed for this study according to Dutch Law (Central Committee on Research Involving Human Subjects, 2017) The participation was strictly voluntary for all participants, and all participants gave verbal consent to participate and to the interview being audio-taped.

4 | RESULTS

4.1 | Participants

In total, eight participants consented to participate in the interviews. Four case managers and three district nurses (N = 7) actually participated in the study. With one nursing student, an interview was planned, but the student cancelled the participation due to time constraints before the start of the interview. There were three individual interviews and two interviews in which two or three participants were interviewed together, conducted in November and December 2017. The mean age of the participants was 43 years (ranging from 28–58 years).

4.2 | Added value

The added value as described by the participants can be summarised into five major themes, which reflect the potential added value of the App: (a) "providing a broader/better overview of possible solutions"; (b) "providing a guideline/checklist for problem assessment and providing advices on solutions"; (c) "supporting an in-depth problem assessment"; (d) "being a support tool for unexperienced

case managers/district nurses"; and (e) "providing up-to-date information." All other statements concerning the added value mentioned once in an interview were summarised as "others. "

In the following section, all themes will be described in more detail backed with literal quotes from the participants, starting with the theme that was described most consistently in all interviews followed by the less consistently mentioned themes.

4.2.1 | Providing an overview of possible solutions

The first theme 'broader and better overview of possible solutions' was mentioned in all interviews. The participants stated that the App provides them with a better and broader overview of possible solutions to deal with practical problems that prevent PwD from living at home. The App provides solutions for practical problems within the domains of decreased self-reliance (such as inability to conduct basic or instrumental activities of daily living), safety-related problems (such as wandering, insufficient food and fluid intake) and informal care and network-related problems (such as the high burden of caregivers or lack of knowledge about dementia-related issues). The participants described it as a valuable tool for gaining insight into solutions that are beyond the scope of their own knowledge and experience. The App enables them to explore new opportunities and challenges them to think in broader terms than simply the standard solutions one would advise normally for frequently occurring problems, as the following quotes show:

> I have standard solutions in mind, however people with dementia are never standard: but for example if someone is inactive, I would search for ways to trigger and activate that person. Then I often advise daycare, but maybe the App will show some solutions, I haven't thought about before. (CM2.1)
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> [I expect] that the App provides the right direction. There are a lot of things [suggestions for solutions] that I already knew but there are also new solutions that catch my attention and where I'll figure out if I can learn new things. (DN1.2)

Moreover, participants described the App as valuable mean to provide the PwD and their informal caregiver's insight into possible solutions as the following quote shows:

> I can immediately show some of the solutions to the informal caregiver, to check whether this solution is suitable. At the moment I need to bring along a lot of folders and I constantly need to "google" solutions. (CM5.1)

4.2.2 | Providing a clear structure/guideline

The third theme "providing a clear structure/guideline for the problem assessment and provision of advices on possible solutions" was

mentioned in all five interviews. The participants described the App as being a guideline for conducting a problem assessment and providing advice on possible solutions. One case manager described the added value as follows:

> The App is like a compass, it helps you to check if you are on the right track: just to see whether you have followed all steps (in the problem assessment) or whether there are aspects that I haven't thought about yet. (CM 5.1)

Participants also described the App as a valuable tool for checking whether one has assessed all the relevant problems and considered all possible solutions. Some participants described a situation in which they visited the PwD at home and investigated the situation, and after they left the persons' home, they started worrying whether they had assessed all the relevant problems. The App can help them to have more peace of mind regarding whether they had investigated all relevant themes. By immediately entering relevant information in the App, one can check whether he or she has assessed all the problem domains covered by the App (self-reliance, safety and informal care/network). Moreover, participants described the added value in terms of a support tool to structure the conversation with the PwD and the informal caregivers, which can make discussions about perceived problems more structured and steady. One case manager described it as follows:

> The App provides structure, especially in situations which are quite busy. Sometimes you have (a meeting with) the client (the PwD) and additionally the informal caregivers, sometimes the informal caregivers have contradictory opinions or want to share a lot of information. Then you could use the App and you could say: "Wait a minute I just want to discuss some questions with your mother (the PwD) about her activities of daily living and then I'll come back to you." Afterwards you could run through the self-perceived pressure of informal care questionnaire with the informal caregiver. (CM 5.1)

Finally, they described the App as tool to be more structured and objective in conducting a problem assessment as the following statement shows:

> The App makes you take a step back and assess the situation without being emotionally involved. (CM 4.2)

4.2.3 | Supporting in-depth problem assessment

The second theme "support for in-depth problem assessment" was mentioned in four of the five interviews. The participants emphasised that the App supports them in conducting an in-depth

assessment of the practical problems preventing PwD from living at home in the three above-mentioned domains. The picture of an iceberg was repeatedly used to describe the added value of the App as the following quote from a case manager shows:

> The iceberg represents that there is a huge part underwater, which you don't see immediately: the same is true for persons with dementia and their informal caregivers. You can always ask superficial questions, but it is important to dicover the deepest part of the iceberg. Therefore, you can use the App, to get suggestions for in-depth questions you can ask the person with dementia and the informal caregivers. (CM2.1)

Participants indicated that the App helps them assess the perceived problems of the PwD and the informal caregivers in more detail. One participant describes that the App could help to gain insight into why a PwD shows a certain behaviour and to assess, for example, why someone refuses support. With regard to the assessment of informal care-related problems, one participant described the added value as follows:

> I think if you use the App, you ask more specific and detailed questions to assess the problem. Normally I would ask the informal caregiver 'How are you? Are you able to cope with the burden of care? How often do you visit the PwD?' and then I would ask it slightly different in another case. This [the App] is a method that I could always use(…) to ensure that I have discussed all relevant issues and questions. (CM2.1)

Thus, in situations in which a formal caregiver might normally ask general questions, the App provides suggestions for more detailed questions to assess the situation of the informal caregiver by, for example, using the questions of the SPPIC questionnaire to estimate the overall level of burden. In the case of high burden, they could further specify what the causes of burden are, for example, in terms of time, physical, emotional/social or financial pressure by using the questions of the App. In addition, participants indicated that the App could also help them to take a broader view on possible problems (e.g., safety issues and informal care-related problems) and prevent them from focusing on only more specific aspects of care (such as wound care, even if this is the primary goal of their visit). In addition, the App was described as a support tool that enables a quick but in-depth analysis of the problems preventing the PwD from living at home.

4.2.4 | Support tool for new/unexperienced caregivers

The fourth theme "support tool for new/unexperienced caregivers" was mentioned in three of the five interviews. The participants

described how the App could be of added value, especially for new and unexperienced district nurses and case managers. Such a tool could help them gain an overview of problems they need to assess and can provide them insight into a broad variety of possible solutions as one district nurse stated:

> I have chosen (the picture with) the signpost. I think especially for people who are quite new in the home-care sector, the App can be very handy […] to gain confidence in how to search for possible solutions. (DN1.2)

4.2.5 | Providing up-to-date information

The fifth theme "providing up-to-date information" *was* mentioned in two of the five interviews. The participants indicated that the App would only be of added value if its content is constantly updated, as the following statement illustrates:

> The crucial point is that I always need to be alert *(in the detection of problems and finding solutions)*. If the App is not updated, I won't be triggered by the App, after using it several times. But if the App is constantly updated I also stay up to date and that is what it's all about. (CM 4.1)

In times where constantly new interventions for PwD (such as the "Tovertafel" an interactive light game for PwD) are being developed, participants regarded it valuable to have a support tool facilitating them to be up to date with regard to possible solutions.

4.3 | Potential usage of the App in practice

With regard to the potential usage of the App, the participants described when they would use the App in the care continuum. In addition, they named contraindications for its usage and finally they described some prerequisites for the usage of the App in practice. All these aspects of the App's potential usage in practice are described below in more detail.

4.4 | Usage in the care continuum

The participants described the App as a support tool and as being a supplement to their current work procedure. It was indicated by the participants that the App could be used in situations in which they see the PwD for the first time and in situations in which they are already familiar with the PwD and whom they have followed up for a while. The participants were undecided whether they would use the App in a first encounter with the PwD or the informal caregiver. Some participants felt that the App might hinder a natural conversation, while others had already made good experiences using digital devices alongside a conversation. In the case of PwD who are

already known by the district nurse or the case manager, the participants stated that they would use the App on a regular basis to assess the problems and to check whether the care and support interventions used are still adequate. According to the participants, the way they would use the App (e.g., in terms of which problem domains they would assess or if they would use both parts, that is the problem assessment and the solutions) depends on several factors. First, it depends on the perceived complexity of a case; in highly complex cases, they might decide to first focus on the most urgent problems, while in other less complex cases, all elements of the App can be used immediately. Second, it depends on their perception about the need for support in problem assessment and finding solutions. In situations where caregiver might feel frustrated or where they do not immediately see a solution, they might perceive a greater need to use the App.

The participants described different ways in which they might use the App in relation to the encounter with a PwD or the informal caregiver. First, they could use the App as a means to prepare a conversation with the PwD or the informal caregiver. It could help them to plan the topic they want to discuss during the encounter and to check what had already been assessed the last time. Second, they could use the App during the encounter to structure a conversation with the PwD and the informal caregiver. Participants emphasised the importance of embedding the usage of the App into the conversation to prevent a disturbance of the natural course of the conversation. During a home visit, the App could be used to fill in questionnaires, such as the SPPIC, a questionnaire to assess the level of burden of the informal caregiver and to immediately save the information gathered. Moreover, the App enables the formal caregiver to show possible solutions (including short videos or informative websites) and to share the links with the PwD or the informal caregivers. Third, participants described its usage after the direct encounter as a means to summarise all the information gathered during a home visit and to explore possible solutions for the detected problems that could be suitable for the PwD or the informal caregiver. In such a situation, the formal caregiver can run through all possible solutions provided by the App and can make a preselection of solutions that could be discussed with the PwD or the informal caregiver during a next encounter.

4.5 | Contraindications for usage

The participants also described situations in which they will not use the App, for example a situation in which there is a tense atmosphere between the formal and informal caregivers, because the informal caregiver has unmet needs that cannot be fulfilled by the formal caregiver. Moreover, they stated that they will not use the App if a PwD is agitated, very emotional or is very suspicious when the caregivers use a digital device. Also, in situations in which the personal contact between the formal caregiver and PwD is especially important, such as end-of-life care, they would not use the App. Participants also indicate that the conversation with the informal caregivers is already the solution providing the informal caregivers the

chance to talk about their experiences and problems, and in such situations, the use of the App will not be an option.

4.6 | Prerequisites

As a prerequisite for the regular usage of the App, the participants indicated that the App needs to contain up-to-date information. They also emphasised that they would need a start phase in which they could become familiar with App and could practise using it. Only if they are familiar with the content could they use it, for example alongside a conversation without disturbing its natural course.

5 | DISCUSSION

The present study shows that district nurses and case managers perceive the App as a valuable supplement to their current work procedure as it may improve their clinical judgement and decision-making with regard to practical problems preventing PwD from living at home. District nurses and case managers mainly appreciated the guidance with a detailed and structured problem assessment and the overview of possible solutions, which provided them insight into the state of the art of care and support for community-dwelling PwD. In times where constantly new (technological) solutions to support PwD and their informal caregivers are becoming available, it is challenging for district nurses and case managers to keep themselves up to date. The App can help them to close the current knowledge gap. If the App provides them with the latest information about care and support options, they can take deliberate decisions about suitable interventions together with the PwD and the informal caregivers. This means that an important prerequisite for added value of the App is that the content of the App is constantly updated. This will ensure that district nurses and case managers can consider solutions that are beyond the scope of their own knowledge.

The aim of the decision support App was to support district nurses and case managers with the complex tasks of clinical judgement and decision-making and to increase uniformity in problem assessment. When comparing the aim with the perceived added value, it can be concluded that district nurses and case managers indeed feel supported by the App in conducting a problem assessment and in providing advices on solutions. It, however, remains debatable whether the aim of increasing uniformity in problem assessment can be reached if the App is used in a "flexible" way, and whether formal caregivers can self-decide about when and how to use the App in daily practice.

Prior research has shown that nurses' level of confidence does not always adequately reflect the level of accuracy with regard to diagnostic judgement and treatment decisions (Adderley & Thompson, 2017). Formal caregivers who are overconfident are expected to be less likely to seek additional information to verify their decisions, or on which to base them, while their decisions are not per definition better (Yang & Thompson, 2010). This has implications for

the development and use of decision support systems, meaning that reliance on the user's judgement to whether they need the assistance of decision support is not sufficient (Friedman et al., 2005). If the aim of a decision support tool is to indeed increase the level of uniformity in problem assessment, it might therefore be necessary to formulate a clear guideline about how to use the App in practice. At the same time, it is not recommendable to obligate the usage of a decision support tool and to provide binding recommendations, as the App is not intended to substitute clinical reasoning but to stimulate a more analytical way of doing so. A study by Dowding et al. (2009) has found that decision support tools providing binding recommendations for a certain course of action were often used in an unintended way and recommendations were routinely overridden, which can have more negative consequences rather than improving practice. Thus, the challenge will be to develop a guideline for usage, which on the one hand stimulates the usage even by confident professionals, but on the other hand leaves enough freedom in usage and stimulates critical reflection of the recommendations provided by the App.

The focus of the current study was to gain insight in the added value of a decision support from the perspective of the formal caregivers and their perceptions regarding the added value of the App for their daily work. This perspective was chosen as the App directly aims to improve the clinical judgement while the ultimate aim is to provide better care for PwD and their informal caregivers. As the App is not yet implemented in practice, no data can be collected about the actual implications of the App for the PwD and their informal caregivers. However, the results of this study gave also some indications that the App is of added value for the PwD and their informal caregivers. The overview of solutions, for example, can be used as a means to inform the PwD and informal caregiver about possible solutions and as a basis for shared decision-making about suitable interventions.

5.1 | Strengths and limitations

Strengths of the current study are that the interviews provided deeper insight into the perceptions of district nurses and case managers about the added value and potential use of the decision support App. This study can be regarded complementary to a previously conducted study on the efficacy and added value of the decision support App.

The current study has some limitations that need to be addressed. A first limitation is the fact that the participants could only talk about their perceptions about the potential added value and the potential usage of the App in practice as they only used the App during a laboratory experiment. Thus, information on real-life experiences is still lacking. However, in the efficacy evaluation study several measures were taken to ensure that the simulation was as close to real life as possible. The case was based on information from real-life cases, and the simulated caregivers strived to engage in a natural conversation. This may allow conclusions to be drawn about the potential added value for daily practice. Second, the study

could not be conducted as initially planned with one focus group interview due to practical reasons; given the time constrains, it was impossible to schedule one meeting to which all participants could attend. However, the chosen alternative of combining individual interviews with two interviews in which two or three people were interviewed simultaneously had its own advantages, such as the opportunity to gain a deeper insight into the perceptions of one person in the individual interviews and to profit from group interaction, which can generate new insights in the group interviews. Third, the perspective of a student as an unexperienced caregiver was not reflected in the interviews. Unfortunately, we could not find a student from the prior study who was able to participate. However, one of the participants indicated that she regraded herself as being new in the home care sector. Fourth, the way participants were recruited and the fact that the participants knew that the interviewers were also the developers of the App might have caused socially desirable answers. However, the interviewers also informed the participants of the lack of evidence supporting the efficacy of the App and participants were encouraged to critically reflect on the App, which might have limit social desirability.

6 | CONCLUSIONS

The decision support App was perceived as valuable tool to support the process of problem assessment and providing advice on possible solutions for PwD who want to age in place. Given the results and limitations of the current study and the previously conducted efficacy study, more research is needed to study the effectiveness of the decision support App before its broad implementation in practice can be recommended. To study its effectiveness, the added value as described by the participants needs to be operationalised into concrete and objective outcome measures. Before testing the App in practice, it is necessary to update its content and to ponder different possibilities to ensure regular updates of the App's content in future. Finally, to improve uniformity in decision-making it might be necessary to define the usage of the App in practice more clearly, to decrease the variability in assessment and decision-making. Moreover, it is recommended to give participants in future studies on decision support tools enough time to familiarise themselves with the App. Only if the user knows how to integrate decision support tools into the complex tasks clinical judgement and decision-making we are able to test the full potential of these tools.

7 | RELEVANCE TO CLINICAL PRACTICE

This study underpins the need of nurses and case managers for decision support with regard to problem assessment and providing advices on possible solutions to facilitate ageing in place of PwD. This study provides important information for developers and researchers in the field of clinical decision support for nurses in a sense that support in problem assessment and support in providing advices on solutions are regarded as valuable, as well as the importance of up-to-date information to be incorporated in decision support tools. Moreover, this study underpins the importance of listing to users' experience and their perceived added value of decision support tools besides of judging the value of a tool merely based on quantitative outcome measures.

CONFLICTS OF INTEREST

None.

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REFERENCES

Adderley, U. J., & Thompson, C. (2017). Confidence and clinical judgement in community nurses managing venous leg ulceration - A judgement analysis. *Journal of Tissue Viability*, *26*(4), 271–276. https://doi.org/10.1016/j.jtv.2017.07.003

Alzheimer Nederland & Vilans (2013). *Zorgstandaard dementie*. Amersfoort, the Netherlands: Alzheimer Nederland & Vilans.

Central Committee on Research Involving Human Subjects (2017). *Your research: Does it fall under them WMO*. Retrived from http://www.ccmo.nl/en/your-research-does-it-fall-under-the-wmo

de Bont, M., van Haaren, E., Rosendal, H., & Wijboldus, M.. (2012). *Expertisegebied wijkverpleegkundige*. Utrecht, the Netherlands: Verpleegkundigen & Verzorgenden Nederland

de Haan, R., Limburg, M., Schuling, J., Broeshart, J., Jonkers, L., & van Zuylen, P. (1993). Klinimetrische evaluatie van de Barthel Index, een maat voor beperkingen in het dagelijks functioneren. *Nederlandse Tijdschrift voor Geneeskunde*, *137*(18), 917–921.

Dewar, B. (2012). *Using creative methods in practice development to understand and develop compassionate care*. 2(1), [2].

Dowding, D., Mitchell, N., Randell, R., Foster, R., Lattimer, V., & Thompson, C. (2009). Nurses' use of computerised clinical decision support systems: A case site analysis. *Journal of Clinical Nursing*, *18*(8), 1159–1167. https://doi.org/10.1111/j.1365-2702.2008.02607.x

Dunn Lopez, K., Gephart, S. M., Raszewski, R., Sousa, V., Shehorn, L. E., & Abraham, J. (2017). Integrative review of clinical decision support for registered nurses in acute care settings. *Journal of the American Medical Informatics Association*, *24*(2), 441–450. https://doi.org/10.1093/jamia/ocw084

Friedman, C. P., Gatti, G. G., Franz, T. M., Murphy, G. C., Wolf, F. M., Heckerling, P. S., & Elstein, A. S. (2005). Do physicians know when their diagnoses are correct? Implications for decision support and error reduction. *Journal of General Internal Medicine*, *20*(4), 334–339. https://doi.org/10.1111/j.1525-1497.2005.30145.x

Grönroos, C., & Voima, P. (2013). Critical Service Logic: Making sense of value creation and co-creation. *Journal of the Academy of Marketing Science*, *41*(2), 133–150. https://doi.org/10.1007/s11747-012-0308-3

Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277–1288. https://doi.org/10.1177/1049732305276687

Luppa, M., Luck, T., Weyerer, S., König, H.-H., Brähler, E., & Riedel-Heller, S. G. (2010). Prediction of institutionalization in the elderly, A systematic review. *Age and Ageing*, *39*(1), 31–38. https://doi.org/10.1093/ageing/afp202

MacNeil Vroomen, J., Van Mierlo, L. D., van de Ven, P. M., Bosmans, J. E., van den Dungen, P., Meiland, F. J. M., … van Hout, H. P. J. (2012). Comparing Dutch case management care models for people with dementia and their caregivers: The design of the COMPAS study. *BMC Health Services Research*, *12*, 132. https://doi.org/10.1186/1472-6963-12-132

Myhomelife Scotland (2017). *Visual inquiry tool*. Retrieved from http://myhomelife.uws.ac.uk/scotland/resources/visual-inquiry-tool/

Olazaran, J., Reisberg, B., Clare, L., Cruz, I., Pena-Casanova, J., Del Ser, T., & Muniz, R. (2010). Nonpharmacological therapies in Alzheimer's disease: A systematic review of efficacy. *Dementia and Geriatric Cognitive Disorders*, *30*(2), 161–178. https://doi.org/10.1159/000316119

Pot, A. M., Deeg, D. J., van Dyck, R., & Jonker, C. (1998). Psychological distress of caregivers: The mediator effect of caregiving appraisal. *Patient Education and Counseling*, *34*(1), 43–51.

Prince, M., Prina, M., & Guerchet, M. (2013). *World Alzheimer Report 2013. Journey of caring. An analysis of long-term care for dementia*. London, UK: Alzheimer's Disease International.

QSR International (2012). *NVivo for Windows: NVivo qualitative data analysis Software (Version Pty Ltd. Version 10)*.

Thoma-Lürken, T., Bleijlevens, M. H. C., Lexis, M. A. S., de Witte, L. P., & Hamers, J. P. H. (2018a). Facilitating aging in place: A qualitative study of practical problems preventing people with dementia from living at home. *Geriatric Nursing*, *39*(1), 29–38. https://doi.org/10.1016/j.gerinurse.2017.05.003

Thoma-Lürken, T., Lexis, M. A. S., Bleijlevens, M. H. C., & Hamers, J. P. H. (2018b). Development and usability of a decision support App for nurses to facilitate aging in place of people with dementia. *Applied Nursing Research*, *42*, 35–44. https://doi.org/10.1016/j.apnr.2018.04.008

Thompson, C., Aitken, L., Doran, D., & Dowding, D. (2013). An agenda for clinical decision making and judgement in nursing research and education. *International Journal of Nursing Studies*, *50*(12), 1720–1726. https://doi.org/10.1016/j.ijnurstu.2013.05.003

von Kutzleben, M., Schmid, W., Halek, M., Holle, B., & Bartholomeyczik, S. (2012). Community-dwelling persons with dementia: What do they need? What do they demand? What do they do? A systematic review on the subjective experiences of persons with dementia. *Aging and Mental Health*, *16*(3), 378–390. https://doi.org/10.1080/13607863.2011.614594

Wolfs, C. A., de Vugt, M. E., Verkaaik, M., Haufe, M., Verkade, P.-J., Verhey, F. R., & Stevens, F. (2012). Rational decision-making about treatment and care in dementia: A contradiction in terms? *Patient Education and Counseling*, *87*(1), 43–48. https://doi.org/10.1016/j.pec.2011.07.023

Yang, H., & Thompson, C. (2010). Nurses' Risk Assessment Judgements: A confidence calibration study. *Journal of Advanced Nursing*, *66*(12), 2751–2760. https://doi.org/10.1111/j.1365-2648.2010.05437.x