



## How to use robot interventions in intramural psychogeriatric care; A feasibility study



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### ABSTRACT

**Background:** Social robots, with Paro being an example, offer new opportunities for innovative approaches in dementia care.

**Objectives:** To investigate how interventions, with the socially assistive robot Paro, can be implemented in daily care practice.

**Design:** Paro was used according to individualized interventions, aiming at predefined specific care problems, during a 3-week period. Selected residents were offered Paro once or twice a week.

**Setting:** Small scale care units (8–10 residents each) in three Dutch care institutions for intramural psychogeriatric care.

**Participants:** A total of 23 dementia patients, 22 female and 1 male, participated.

**Intervention:** Three intervention types were applied, one for therapeutic purposes, one for facilitating daily care activities and one to support social visits.

**Measurements:** The experience of care staff, informal caregivers and patients with Paro were registered qualitatively by means of a registration form in which each occasion of Paro use was briefly reported. Additionally, care staff was interviewed using a semi-structured qualitative questionnaire.

**Results:** The 23 residents were involved in 36 individually defined interventions, and in total 71 sessions were carried out. In the majority of cases, care staff and patients considered the Paro interventions to be of added value for the care provided.

**Conclusion:** The use of Paro can be well individualized to the needs of patients, the resulting individual Paro intervention can be well implemented in day to day care, and Paro may have added value when used in a well-directed way.

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### 1. Introduction

Psychogeriatric care for patients with dementia in the Netherlands is traditionally provided by professional caregivers in combination with informal caregivers. With the increasing incidence of dementia and the societal demand for cost reduction in care in general, a need grows for innovative care concepts to sustain and preferably improve the quality of psychogeriatric care. Technology is widely regarded as an important potential for such care innovation (Butter, Rensma, Boxtel, Kalisingh, et al., 2008). ICT technology and robotics are under rising attention of innovators (Butter, Boxtel, Kalisingh, Gelderblom, et al., 2007). The application of robotics seems particularly successful in the

form of socially assistive robotics for which patients with dementia are often seen as a potential beneficiary group (Broekens, Heerink, & Rosendal, 2009; Tapus, 2009). But, as most assistive robotic developments, the implementation of socially assistive robots is, after the technical development of the robot system, a major hurdle on the route to application of the robot in day to day care practice (Bemelmans, Gelderblom, Jonker, & de Witte, 2012). As the robot systems are developed to function close to patients and their caregivers, where the robots are supposed to support everyday care provision, it is essential that the use of the robot fits seamlessly into the established care provision practice. To facilitate this, the robot by itself should be seen as a mere starting point for care innovation. When it is to be applied as an instrument supporting psychogeriatric care there should be an intervention surrounding the robot, specifying usage, users and purpose of the robot application in such a way that caregivers are guided in putting the robot to effective use and can regard the robot as an instrument in their care provision rendering added value for their clients and their efforts (Bemelmans, Gelderblom, Spierts, Jonker, & de Witte, 2013).

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This study sets out to develop specific intervention for psychogeriatric care involving the socially assistive robot Paro (Shibata, Wada, Saito, & Tanie, 2004; Wada, Shibata, Asada, & Musha, 2007).

Three types of interventions were developed in close collaboration with four Dutch care institutions for elderly care (Bemelmans et al., 2013). These three interventions aim at:

1. Therapeutic purposes: depending on individual needs Paro can stimulate perception, psychological functioning, psychosocial well-being and social behavior.
2. Facilitating daily care activities, making use of the attention focused on Paro or its comforting ability when made available.
3. Supporting social visits: the activating qualities of Paro on the patient could be used to provide a shared focus point for both the patient and family member(s) and stimulate the attractiveness of visits.

This paper reports on a study in which these three different types of interventions with Paro are applied in three different psychogeriatric care facilities. The Paro interventions were applied to individual patients (see Figure 1 for an example) translating one of the above mentioned aims into individualized goals in line with therapeutic or care-related aims formulated for these individuals by the care professionals.

The aim of this study was to investigate how the interventions can best be implemented in daily care practice, and what the experiences of care staff, informal caregivers and patients are when doing so. In addition we wanted to evaluate the experienced added value of these interventions.

## 2. Methods

The study was executed in three Dutch care institutions for psychogeriatric care: Sevagram, located in Heerlen, with a total of 2500 employees; Proteion, located in Horn, employing 1400 care professionals; Dignis, located in Zuid Laren, employing 4500 care professionals. All three offer both intramural and extramural elderly care, including psychogeriatric care and somatic care. In each organization, local small scale care units (8–10 residents each) were selected by the organizations for this study.

### 2.1. Procedure

As Paro was new to all care staff, the first step in the study was providing a brief training of care staff of the involved care units to familiarize them with the robot, its purpose and foreseen application. The training included one meeting and a two-week period in which staff had the opportunity to familiarize themselves with Paro by means of hands on experience and an Internet-based training module containing written material and video instructions. For the practical application of



Figure 1. Example of Paro interacting with elderly resident.

the Paro interventions, a procedure was developed leading to clarification on which residents would be involved in the study and for what purposes. The procedure was developed such that it matches the process followed in providing day to day care to the residents. For each of the selected residents a personal goal was specified by the responsible multidisciplinary team within one of the three intervention types formulated. For example: Mrs. A was selected as a suitable participant on the basis of the problematic behavior she displays when making regular visits to the pedicure. Two care staff members usually have to accompany Mrs. A to enable the pedicure to perform her services. The goal of involving Paro would be to facilitate the visit and to make it possible without the accompanying care staff.

After the selection of the residents by the multidisciplinary team, approval was sought for each participant by the legal representatives. In accordance with Dutch legislation (Dute et al., 2004) signed informed consent by the legal representatives of the participants gave way to inclusion of residents in the study.

To monitor the success of using Paro, assessment tools were selected involving assessment by staff members of the impact of the use of Paro on the selected aims at an individual level. Following the selection of participants and preparation of the assessment instruments, Paro was used with the selected residents according to the individualized interventions during a 3-week period. Prior to the actual use of Paro a baseline measurement was taken. This baseline measurement concerned observation of the problematic behavior of each individual and the usual solution care staff would offer in this situation. After the use of Paro, involved care staff completed the assessment tool. By means of an interview the reports written down in the assessment forms were discussed, to ensure understanding of the material by the researcher. During the interventions aiming at social visits a care provider observed the interaction and completed the outcome instrument in consultation with the involved family members.

Following the period of data collection and analyses, a de-briefing meeting was organized with family members and the participating care staff in order to share experiences and inform them about the results of the study. The whole process involved both design and execution of the Paro intervention procedure. Table 1 shows an overview of the consecutive steps carried out in this study.

### 2.2. Interventions

Each intervention description contained a target group description, a description of the context and the application, and the type of outcomes and suitable outcome assessment tools. For the application of these interventions on an individual level a specification of the intervention is required, making the aim of the application valid for the individual, having a problematic behavior or care problem of the individual explicated as a reason for introducing Paro. This provides a clear target for the use of Paro for each individual.

### 2.3. Individual use of Paro

In total 23 residents were considered for inclusion in this study. Selected residents would be offered Paro following the aims identified for each individual within one of the intervention types, once or twice a week during 3 weeks. The duration of Paro use at each of these occasions typically would be 10–15 minutes.

In case individual residents would obviously decline Paro, the interaction with Paro would be immediately stopped and reported as such. When this would be considered a temporal refusal a new attempt would be made later, following the original schedule. However, when this refusal was considered to be a definite viewpoint of the resident no further attempts would be undertaken to have this resident interact with Paro. These decisions had to be made by the first responsible care provider, who would notify the researcher. Care staff introduced Paro to the residents in a manner described in a work protocol. Also the role of

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