

Feasibility of the Translating Innovations into Practice-toolbox (TIP-toolbox)

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Feature Article

Feasibility of the Translating Innovations into Practice-toolbox (TIP-toolbox): A mixed-methods study for implementing activity innovations in nursing homes



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ABSTRACT

This mixed-methods study evaluated the feasibility of the Translating Innovations into Practice (TIP)-toolbox. This toolbox guided nursing staff in 6 practical steps in developing a structured and tailored implementation plan to sustainably implement an innovation. For 9 weeks, 12 registered nurses (RNs) at 3 nursing homes in the Netherlands used the TIP-toolbox to develop an implementation plan related to promoting functional activity among nursing home residents. Data were collected by questionnaires, telephone interviews, participant observations, and focus group interviews. The RNs conducted most steps according to the plan. The main hampering and facilitating factors were a lack of support and collaboration. Most RNs were satisfied with the TIP-toolbox, but some considered it somewhat complex. To increase satisfaction and reduce the toolbox's complexity, the participants made suggestions for improvements. The findings of this study indicate that the TIP-toolbox was feasible and supported nursing staff in developing an implementation plan, although minor adaptations are needed.

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Introduction

Nursing staff are expected to provide high-quality care. They need to provide care according to the latest evidence. Nonetheless, studies show that a gap exists between the available evidence and nursing practice.^{1–5} For example, research shows a lack in the use of best practices regarding mouth care,¹ urinary catheter care,² prevention of pressure ulcers,³ and promotion of activity.⁵ To bridge the gap between evidence and practice, it is important to implement evidence-based innovations.⁶ In this study, we particularly focused on implementing innovations related to the promotion of functional activity.

Successful implementation requires the use of a structured approach in which local barriers are considered and strategies are used to overcome these barriers.⁷ In nursing practice, registered nurses (RNs) can be the driving force behind the implementation.

Involvement of such frontline staff in the implementation process increases the commitment toward the innovation.⁸ The interpersonal contact between these RNs and other nursing staff improves the likelihood that nursing practice can be changed.^{9,10} To facilitate RNs in implementing innovations in a structured manner and to bridge the gap between evidence and practice, the Translating Innovations into Practice (TIP)-toolbox was developed.

The TIP-toolbox was based on the Implementation of Change Model of Grol and colleagues, a model integrating several theories and models for change.¹¹ In the 6 practical steps of the toolbox, users are guided toward developing a structured and tailored implementation plan to sustainably implement an innovation. Each step supports the user to critically appraise what is essential to implement an intended change in a specific context. The TIP-toolbox comprised several tools to facilitate the development of an implementation plan. Nursing home staffers were actively involved in the development of the different parts of the TIP-toolbox. In the toolbox's current form, the innovation to be implemented entailed nursing staff promotion of functional activity among nursing home residents. This included encouraging residents' independence during the activities of daily living (for example, bathing) as well as encouraging them to perform household activities (for example, setting and clearing the table).

Abbreviation: TIP-toolbox, Translating Innovations into Practice-toolbox.

Conflicts of interest: None.

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Focusing on nursing homes is relevant given the scarcity of evidence regarding the implementation of change, particularly in this setting.¹² Promoting functional activity is a highly relevant topic in nursing homes. In the last decade, several studies have investigated how nursing staff can encourage nursing home residents to be more active during the day^{13–16}; however, residents are still highly inactive.^{17,18} A recent observation study in the Netherlands showed that when nursing staff were involved in residents' activities, they took over 45% of these activities.⁵ To implement change and improve nursing care, an instrument like the TIP-toolbox can be used.

The aim of this study was to evaluate the feasibility of the TIP-toolbox, an instrument developed to support nursing staff step-by-step in implementing an innovation in nursing homes in order to further improve the toolbox for the needs of its end-users. Feasibility was studied by assessing the dose (the extent to which all steps of the TIP-toolbox were conducted), the fidelity (application of the TIP-toolbox as planned), the context (facilitating or hampering factors), the satisfaction (participants' satisfaction with the TIP-toolbox), complexity (the perceived complexity of the TIP-toolbox), and adaptations (suggested adaptations to achieve better outcomes).

Methods

Design

This feasibility study used a mixed-methods design, including qualitative and quantitative measures. Across-method triangulation¹⁹ was conducted to obtain rich data. Data were collected by questionnaires, telephone interviews, participant observations, and focus group interviews. The study was conducted from March 2016 to May 2016. The Medical Ethical Review Committee of Zuyderland-Zuyd approved the study protocol (#16-N-31). All participants provided informed consent. The CONSORT checklist for feasibility trials²⁰ and the CASP guidelines for qualitative research²¹ were considered in reporting this study.

Setting and sample

The study was conducted in 3 nursing homes in the south of the Netherlands. These nursing homes are embedded in the Living Lab in Aging and Long-Term Care,²² a structural collaboration between

7 organizations providing long-term care (home care and nursing home care), Maastricht University, and Zuyd University of Applied Sciences. The 3 participating nursing homes acknowledged the importance of promoting functional activity and had a task force on improving activity in general. Two of the nursing homes provided psychogeriatric care for people with dementia and 1 nursing home provided somatic care for people with chronic physical problems. The 3 involved nursing homes comprised 7, 1, and 4 wards, respectively. From each ward, 1 RN participated in this study (12 RNs in total). A purposive sampling method was used to recruit the RNs; each ward was asked to recruit 1 RN with a bachelor's degree or, if not available, an RN with 4 years of secondary vocational training. This RN was, preferably, familiar with the ins and outs of the organization, competent in communicating and collaborating, and regarded as a role model. For the participant observations, 3 of the 12 RNs were randomly selected by the research team, 1 bachelor-educated RN and 2 vocationally trained RNs.

The TIP-toolbox

The aim of the TIP-toolbox was to support nursing staff in developing a structured and tailored implementation plan to sustainably implement an innovation in a specific setting. To guide nursing staff during this process, the toolbox comprised 6 steps that were derived from the Implementation of Change Model of Grol and colleagues.¹¹ Table 1 provides an overview of the 6 steps. The TIP-toolbox took the form of a paper booklet that could also be viewed digitally (in PDF) and was supplemented with electronic tools. It started with an introduction about the importance of promoting functional activity among nursing home residents, the preconditions for an implementation project, and a thorough description of the 6 steps. To assist the nursing staff in the steps, the TIP-toolbox contained several tools (Fig. 1).

The TIP-toolbox was introduced to the participating RNs during a 1-h educational meeting at the start of the study. In this meeting, guided by the first author, a researcher trained in implementation in healthcare, the RNs were briefly introduced to the steps of the TIP-toolbox, informed about the importance of implementing innovations in a structured manner, and asked to observe to what extent functional activities are promoted in their ward during daily care. For the current study, a timeline was set (Table 1). Within a period of 9 weeks, the RNs needed to develop an implementation plan for an activity-related innovation using Steps 1 through 6 of

Table 1
Content of the TIP-toolbox and timeline.

| Steps of the TIP-toolbox | Components | Timeline |
|--|--|---------------|
| Step 1: Formulating a proposal for change in practice with clear targets | Formulation of a proposal for change Formulation of SMART goals | Week 1 |
| Step 2: Assessing the performance of nursing staff and existing barriers and formulating specific targets for change | Administering the MAINTAIN behaviors and MAINTAIN barriers among at least 5 nurses in the ward and verifying completion Entry of the data into a data-analysis tool Creating an overview of the functional activities that are the least encouraged Creating an overview of the most mentioned barriers Formulation of specific SMART targets for change based on the behaviors of the nursing staff | Weeks 2 and 3 |
| Step 3: Selecting and tailoring a set of strategies | Selection of strategy related to nursing professionals and/or the social context and/or the organizational context Tailoring selected strategies to the most important barriers | Weeks 4 and 5 |
| Step 4: Planning the implementation process | Developing a realistic action plan Contacting persons who could conduct the implementation strategies | Weeks 6 and 7 |
| Step 5: Integrating improvement within the normal practice routines | Deciding which activities have to be undertaken to make the innovation lasting | Weeks 8 and 9 |
| Step 6: Evaluating (and revising) the plan | Deciding on how the implementation process should be evaluated | Weeks 8 and 9 |

TIP-toolbox = Translating Innovations into Practice-toolbox; SMART = Specific, Measurable, Attainable, Realistic, Time-sensitive; MAINTAIN = MAastricht Nurses Activities Inventory.

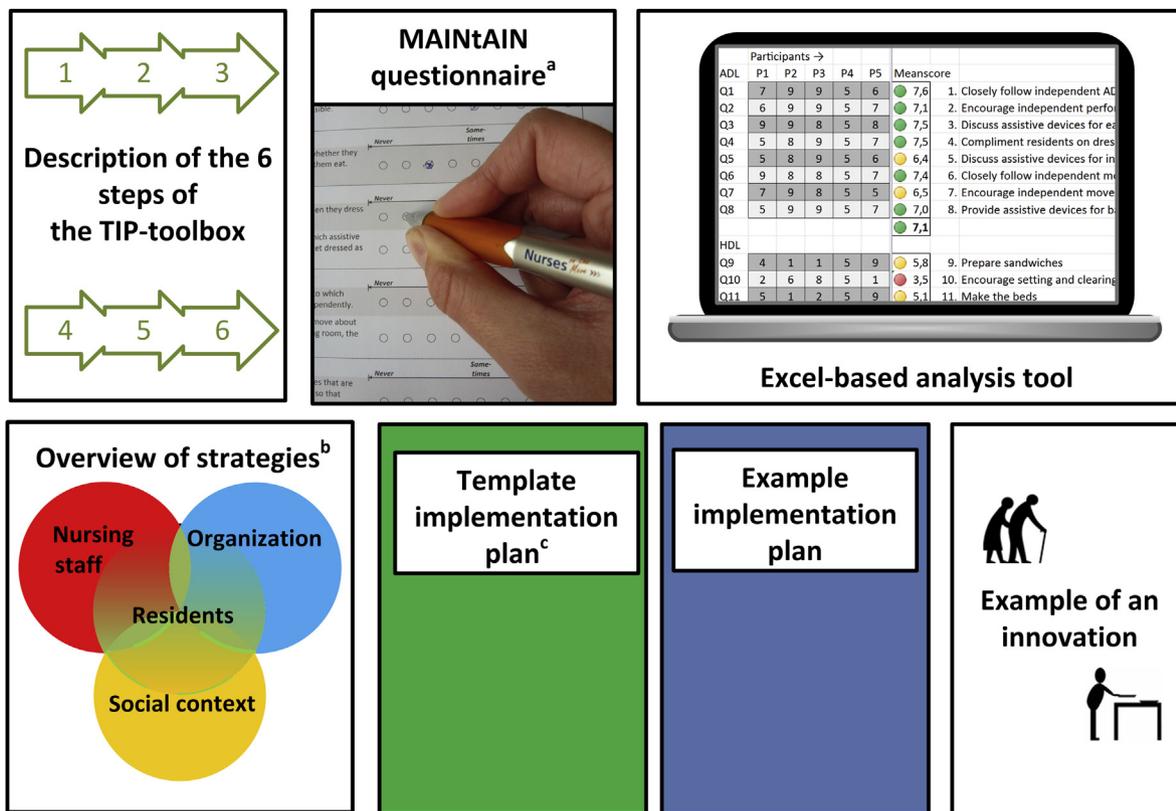


Fig. 1. Content of the TIP-toolbox. MAINtAIN = MAastricht Nurses Activities INventory; TIP-toolbox = Translating Innovations into Practice-toolbox. ^aThe MAINtAIN questionnaire included the MAINtAIN behaviors and MAINtAIN barriers²³ for assessing the extent to which nursing staff promote functional activity among residents and the perceived barriers and facilitators that staff may encounter, respectively. ^bThe implementation strategies (aimed at nursing professionals, the social context, and the organization) were developed in co-creation with nursing home staff from different long-term care organizations in the Netherlands.²⁴ Strategies included, among others, providing a clinical lesson, exchanging nursing staff between wards, and organizing a theme day. ^cThe step-by-step template for an implementation plan was available on paper as well as in electronic format, in Microsoft Word and PDF.

the TIP-toolbox. This implied that the RNs were not expected to actually implement the innovation within the given 9 weeks.

Data collection

Feasibility was evaluated based on the relevant key elements of a process evaluation.^{25,26} Elements assessed were *fidelity*, *dose*, *context*, *satisfaction*, *complexity*, and *adaptations*. Table 2 provides an overview of the operationalization of these elements and the corresponding data collection methods.

Fidelity and *dose* were assessed on the basis of parts of the implementation plan that participants emailed to the research team every 1 or 2 weeks after the completion of each step. The elements *context*, *satisfaction*, *complexity*, and *adaptations* were

assessed using web-based questionnaires, telephone interviews, participant observations, and focus group interviews. After each step, the participants completed a web-based questionnaire that was created with Qualtrics survey software (Qualtrics, Provo, UT, USA). These questionnaires included open-ended questions on the elements operationalized as depicted in Table 2. Satisfaction and complexity (including the capability to complete the steps and the difficulty experienced) were also rated on a scale from 1 to 10, ranging from very dissatisfied to very satisfied, not at all capable to very capable, and very easy to very difficult, respectively. To ensure that all necessary data were gathered, the questionnaire was followed by a short telephone interview. In addition, the first author, who was trained in qualitative research, conducted participant observations each time the 3 selected RNs executed a step of the

Table 2
Outcome measures of the process evaluation and how they were measured.

| Element | Operationalization | Measurements | | | | |
|--------------|--|--------------|---|---|----|---|
| | | IP | Q | I | FG | O |
| Fidelity | Extent to which each step of the TIP-toolbox was conducted as planned | + | | | | |
| Dose | The extent to which all steps of the TIP-toolbox were conducted by each participant | + | | | | |
| Context | The extent to which contextual factors facilitated or hampered conducting the steps of the TIP-toolbox | | + | + | + | + |
| Satisfaction | The extent to which the participants were satisfied with each step of the TIP-toolbox | | + | + | + | + |
| Complexity | The perceived complexity of each step of the TIP-toolbox, that is, the extent to which participants found themselves capable of completing the step and the difficulty of the step | | + | + | + | + |
| Adaptations | Alterations that should be made to the TIP-toolbox to achieve better outcomes | | + | + | + | + |

IP = parts of the implementation plan that are uploaded by the participants every 2 weeks; Q = digital questionnaire participants had to complete every 2 weeks once a part of the TIP-toolbox was completed; I = short telephone interview after each completed step; FG = focus group interview at the end of the study in which the entire TIP-toolbox was evaluated; O = observations of 3 participants during the execution of each step; TIP-toolbox = Translating Innovations into Practice-toolbox.

TIP-toolbox. During these observations, field notes were taken and difficulties were discussed. Finally, at the end of the study, 2 focus group interviews were conducted; the participants were divided into 2 groups to allow active participation. The first author moderated the focus group interviews using a topic list that was based on the previously mentioned key elements of process evaluation as summarized in Table 2 (for example, participants' satisfaction with the toolbox and the complexity of the toolbox). Notes were taken by a second researcher and audio recordings were made. A summary of the outcomes of the focus group was sent to each participant for a member check.

Additionally, the background characteristics of the participants (gender, ward type where they worked, profession, age, years of professional experience, and number of work hours per week) were assessed with a web-based questionnaire.

Data analyses

Quantitative data were analyzed using descriptive statistics in SPSS Statistics (version 22, IBM, Armonk, NY, USA). Qualitative data (answers to open-ended questions and data from the telephone interviews, the participant observations, and the focus group interviews) were analyzed independently by 2 researchers (including the first author and a researcher not involved in the data collection) using directed content analysis.²⁷ This entailed that the main coding categories were predetermined; they were based on the relevant key elements of the process evaluation (context, satisfaction, complexity, and adaptations). Within these categories, sub-categories were established. Differences in coding were discussed until a consensus was reached. The individual data collected for each step by questionnaires and telephone interviews formed the basis for the analyses; this was supplemented by the data from the observations and the focus group interviews. With regard to the fidelity, two researchers, both uninvolved in the data collection, used a checklist to independently score if the implementation plans adhered to the steps of the TIP-toolbox and their underlying components (that is, if participants completely, partly, or not at all performed each step as intended; Table 1 shows the steps and their components). Any discrepancies in scoring were resolved with the first author.

Results

Background characteristics

Table 3 provides an overview of the background characteristics of the participating RNs. Three of the 12 RNs had a bachelor degree in nursing; the others received 4 years of secondary vocational training. The 3 randomly selected RNs who were observed during the study worked at psychogeriatric wards. The professional experience of these 3 RNs varied from working in the nursing home for 1 year ($n = 2$) to 32 years ($n = 1$).

Dose

Of the 12 participants, 10 completed all 6 steps of the implementation plan. Two participants withdrew during the study. The first withdrew after Step 2 due to health problems and the second withdrew after Step 4 due to annual leave.

Fidelity

Table 4 provides an overview of the extent to which the participants completed the steps of the TIP-toolbox according to plan (fidelity) and the time that it took them to complete each step. Step

Table 3
Characteristics of the participating RNs ($N = 12$).

| | <i>N</i> | Mean \pm SD (range) |
|---------------------------------|----------|-----------------------|
| Gender | | |
| Female | 10 | |
| Male | 2 | |
| Ward type | | |
| Psychogeriatric ward | 8 | |
| Somatic ward | 4 | |
| Educational level | | |
| Vocationally trained RN | 9 | |
| Bachelor-educated RN | 3 | |
| Age (years) | | 40 \pm 13 (21–54) |
| Professional experience (years) | | 16 \pm 13 (1–38) |
| Work hours per week | | 31 \pm 4 (24–36) |

RN = registered nurse.

1, formulating a proposal for change in practice with clear targets, was least often performed according to plan. Participants had difficulties with formulating SMART goals (Specific, Measurable, Attainable, Realistic, Time-sensitive); for example, they were not always specific in what they would like to change or within what timeframe. Step 2 was the most time-consuming step according to the participants. This step was more often performed according to plan than Step 1, but 2 of the 12 participants did not succeed in recruiting 5 of their colleagues in the ward to fill out the MAastricht Nurses Activities INventory (MAINtAIN) questionnaire. Furthermore, their formulated targets for change were not always completely based on the results of the MAINtAIN questionnaire or were not specific. Overall, Steps 3 to 6 were conducted in line with the toolbox instructions. However, applying consistency and precision throughout the steps was challenging (the implementation strategies selected in Step 3 did not always match all the barriers that were exposed in Step 2). In general, the implementation plans of the 4 participants working on the somatic wards were most consistent and most clearly formulated; these plans adhered to all the steps of the TIP-toolbox.

Context

Participants indicated that several contextual factors facilitated or hampered performing the steps of the TIP-toolbox. Categorization of the data led to factors related to the professional context and factors related to the social and organizational context.

Factors related to the professional context that positively affected the implementation of the steps of the TIP-toolbox according to the RNs were prior knowledge about the Implementation of Change Model of Grol and Wensing (mentioned by a bachelor-educated RN), and being new in a ward which meant that they were not influenced by existing routines. The observations and telephone interviews showed that a lack of computer skills of 2 of the participants negatively affected the implementation of the toolbox steps.

Among the factors related to social and organizational context, support and the lack of support from others were most frequently mentioned as facilitating and hampering factors, respectively. This support included support from participants from other wards involved in the study, a manager, an occupational therapist, or the organization in general. Two of the participants mentioned that they missed the opportunity to confer with other participants. Another participant stated that working in shifts made it difficult to discuss with other people. In contrast, the 4 participants from the somatic wards collaborated during the study and perceived this collaboration as valuable; they discussed challenges and felt encouraged by working toward a shared goal. In addition, while

Table 4
Participants' fidelity to the steps of the TIP-toolbox and their time investment.

| Steps of the TIP-toolbox | Fidelity ^a | | | Time investment (minutes) |
|--|-----------------------|------------------|---------------|---|
| | Fully (n/total) | Partly (n/total) | Not (n/total) | Mean ± SD (range) |
| Step 1: Formulating a proposal for change in practice with clear targets | 6/12 | 6/12 | – | 37 ± 29 (15–120) |
| Step 2: Assessing performance of nursing staff and existing barriers and formulating specific targets for change | 9/12 | 3/12 | – | 95 ± 77 (15–240) |
| Step 3: Selecting and tailoring a set of strategies | 10/11 | 1/11 | – | 62 ± 46 (30–180) |
| Step 4: Planning the implementation process | 11/11 | – | – | 37 ± 15 (20–60) |
| Step 5: Integrating improvement within the normal practice routines | 10/10 | – | – | 35 ^b ± 14 (20–60) ^b |
| Step 6: Evaluating (and revising) the plan | 8/10 | – | 2/10 | |

TIP-toolbox = Translating Innovations into Practice-toolbox.

A total of 12 registered nurses participated in this study; 1 of them withdrew after Step 2 and another after Step 4.

^a Fidelity: The number of participants performing the steps according to the toolbox instructions. Fidelity was assessed by 2 authors who independently scored whether the completed implementation plans adhered to the steps of the toolbox and their underlying components. Discrepancies in scoring were resolved with a third author.

^b Participants performed Steps 5 and 6 simultaneously.

most of the participants felt the support of their manager, 1 participant stated during the focus group interview that she did not discuss the project with her manager and her manager did not inquire about it. Moreover, the manager of 1 of the observed participants did not allow the full execution of a strategy she had selected; instead of 2 reinforcing educational meetings, she was allowed to organize only 1.

Satisfaction

The results from the questionnaire showed that in general, the participants were satisfied with the TIP-toolbox (the mean score per step ranging from 7.2 to 8.1 on a scale from 1 [very dissatisfied] to 10 [very satisfied]; Table 5). With more steps completed, they seemed more satisfied. The participants considered the format of the TIP-toolbox attractive. One participant mentioned that the MAINTAIN questionnaire revealed issues that remained unnoticed before, for example, the extent to which residents were involved in household activities. Participants valued the example of the completed implementation plan in the TIP-toolbox because it clarified in what detail the plan could be filled out.

Dissatisfaction was also expressed. Three participants stated that they found parts of the TIP-toolbox difficult to understand, particularly the first 2 steps in which they had to formulate a SMART goal, administer the MAINTAIN, and map the experienced barriers and perceived behavior of the nursing staff. One participant indicated a preference for verbal explanation during the execution of the steps in addition to the educational meeting at the start of the study.

When asked during the focus group interviews about a preferred format for a future toolbox, all participants preferred a paper-based version over a digital version. Participants differed in

Table 5
Participants' satisfaction with the TIP-toolbox and its perceived complexity.

| | Satisfaction ^a | Complexity | |
|--------|---------------------------|-------------------------|-------------------------|
| | Mean ± SD (range) | Capability ^b | Difficulty ^c |
| | Mean ± SD (range) | Mean ± SD (range) | Mean ± SD (range) |
| Step 1 | 7.9 ± 1.1 (6–10) | 8.0 ± 1.1 (6–10) | 3.5 ± 1.2 (2–6) |
| Step 2 | 7.2 ± 1.8 (3–10) | 7.0 ± 2.3 (3–10) | 4.7 ± 2.1 (3–9) |
| Step 3 | 7.5 ± 1.1 (6–10) | 7.7 ± 1.4 (5–10) | 4.4 ± 1.4 (1–6) |
| Step 4 | 8.1 ± 1.1 (7–10) | 7.8 ± 1.4 (5–10) | 3.4 ± 1.1 (2–6) |
| Step 5 | 8.1 ± 1.1 (7–10) | 8.3 ± 0.9 (7–10) | 3.2 ± 0.9 (1–4) |
| Step 6 | 8.1 ± 1.1 (7–10) | 8.3 ± 1.1 (7–10) | 3.2 ± 0.9 (1–4) |

TIP-toolbox = Translating Innovations into Practice-toolbox.

^a Theoretical range: 1–10 (very dissatisfied to very satisfied).

^b Theoretical range: 1–10 (not at all capable to very capable).

^c Theoretical range: 1–10 (very easy to very difficult).

their opinions regarding the 9-week timeline in this study for developing the implementation plan. Four of the 12 participants considered this too short. However, according to 2 of them, deadlines were needed and a 12-week timeline would have been ideal. For 1 participant, the timeline could have been shorter; she finished Step 1 within a few days and immediately continued with the next steps.

Most of the participants felt that the TIP-toolbox already took effect during the study; colleagues became more aware of the importance of promoting activity. For example, 1 observed participant mentioned that, instead of the staff, now residents opened the door when the ward doorbell rang.

Complexity

The outcomes of the questionnaire revealed that most participants considered themselves capable of performing the steps (the mean capability ranging from 7.0 for Step 2 to 8.3 for Steps 5 and 6 on a scale from 1 [not at all capable] to 10 [very capable]) and that several participants experienced difficulty in some of the steps of the TIP-toolbox (the mean difficulty ranging from 3.2 for Steps 5 and 6 to 4.7 for Step 2 on a scale from 1 [very easy] to 10 [very difficult]; Table 5). The last 3 steps were considered easier than the first 3. According to 3 of the 12 participants, Step 2 was perceived as the most complex because it was particularly difficult to get their colleagues to fill out the MAINTAIN questionnaires within the given timeframe.

Other factors that increased the complexity of the TIP-toolbox according to some of the vocationally trained RNs were the language used in the materials ($n = 3$) and the basic computer skills that were required to fill out the implementation plan ($n = 2$). Furthermore, the observations and telephone interviews showed that 2 of the participants considered it challenging to link the different parts of the TIP-toolbox; for example, they started filling out the template implementation plan without reading the explanation for the related step. Another complicating factor was a lack of overview ($n = 2$) when 1 ward comprised 3 subunits and the participating RNs were not familiar with all the subunits. This hampered carrying out the steps and developing an implementation plan tailored to the entire ward.

Adaptations

Participants suggested several adaptations regarding the content of the toolbox. Most of these adaptations were focused on increasing collaboration with others and increasing the feeling of support. First, to increase the collaboration with and support from other colleagues in the ward, 1 participant suggested that the

TIP-toolbox could comprise more information on the extent to which colleagues in the ward should be involved and informed during the implementation process, for example, regarding the chosen targets for change. Another suggestion was to include more educational information about the specific topic in this study functional activity to facilitate the process of informing and convincing colleagues in the ward. Second, 2 participants preferred the appointment of a second person in the ward to be a sparring partner and share responsibilities. Third, during the focus group interviews, the participants were convinced that collaboration between the RNs involved in the implementation could be very helpful and therefore should be emphasized more strongly in the TIP-toolbox. Other content-related adaptations recommended by the participants pertained to the toolbox's complexity. To make it easier to understand, participants suggested several changes related to the language used, for example, shorter sentences and avoiding difficult words.

Regarding the toolbox format, several participants recommended changing the order of its tools. In the current form, the TIP-toolbox provides a thorough description of *all* the steps, which is then followed by appendices for the different tools, for example the step-by-step template-implementation plan. Participants suggested combining all information and tools per step. According to the participants, this would make it easier to link the different parts of the TIP-toolbox and would decrease its complexity.

Discussion

The findings of this in-depth mixed-methods study indicate that the TIP-toolbox was feasible and supported nursing staff in the step-by-step development of a structured and tailored implementation plan for innovations in nursing homes, although various adaptations are needed to further improve the toolbox and reduce its complexity. Although not all implementation plans were completely formulated according to plan, the participants were generally able to apply the toolbox in practice.

In this study, fidelity was affected by the participants' difficulties in formulating SMART goals. Other studies also found that setting goals can be challenging.^{28,29} Although the participants were able to go forward with their implementation plans, setting specific and measurable goals is necessary to be able to evaluate the effectiveness of the implementation process.^{11,29} A previous study shows that an interactive educational session could increase the ability to formulate SMART goals.²⁹ Hence, the educational meeting at the start of this study could be extended with information and exercises related to goal-setting.

Several factors influenced the development of the implementation plan. Support from and collaboration with others were considered particular facilitating factors, while factors that made the development more difficult included being unable to get enough colleagues to fill out the MAINTAIN questionnaire in Step 2 and difficulties with the language used in the toolbox. Although very few studies have examined how nurses in nursing homes can be supported in implementing innovations, our findings are in line with studies in different healthcare settings that found that critical facilitators for successful implementation include support from all levels within the organization,^{30–34} teamwork and collaboration,^{30,32} successful leadership,^{31–33} and the content of the innovation itself.^{31,32} The challenge is how the TIP-toolbox can be improved in such a way that the facilitating factors are strengthened and hampering factors are minimized. On the one hand, adaptations to the toolbox are needed relating to the language use and more specific instructions about the support that is required and the fact that the implementation of innovations is a joint responsibility in the organization. The latter includes

actively involving all layers within the organization from the start of the implementation.³³ On the other hand, it is important to carefully select those who take the lead in the implementation. The results of this study indicate it is important that the people involved in the implementation of innovations in practice demonstrate leadership behavior and are competent in collaborating and in processing information, competencies previously found important in a study by Holleman et al.⁹ Besides carefully selecting those involved in the implementation, additional coaching may also contribute to the implementers' performance and competencies.⁹

The extent to which the results of this study are generalizable to nursing homes other than the 3 in which the feasibility of the toolbox was examined depends on several aspects. First, implementing innovations using the TIP-toolbox requires the presence of an RN to lead the implementation process, preferably in cooperation with others, but the availability of RNs could be a bottleneck for some nursing homes. The proportion of RNs in nursing homes differs per country,³⁵ but in general, the educational level of the staff in nursing homes is relatively low compared to other health care settings.³⁶ The availability of bachelor-educated RNs might be particularly limited, which was also the case in the present study. In the Netherlands, bachelor-educated RNs are expected to be competent in initiating and implementing innovations and providing leadership, while vocationally trained RNs are trained in applying innovations.³⁷ Involving only vocationally trained RNs might result in more hampering factors and a lower fidelity. Second, the successful use of the TIP-toolbox requires the nursing home management to support the RNs in their implementation efforts. In the current study, the nursing homes already had a task force on improving activity in general. In other words, promoting activity was on their agenda, which is according to Rogers³⁸ the first step toward innovation. Although the presence of a task force does not guarantee success (some participants within this study felt a lack of support from their ward managers), support from other levels in the organization is important for the implementation process. A previous study of Stewart et al.⁸ found that implementation efforts are most likely to succeed when a combination between a bottom-up and top-down approach is taken, in which frontline staff take the lead and the management and administrators provide support.

This study has some limitations. We cannot exclude that information bias has occurred. Although the observer tried not to intervene during the observations that were conducted in this study, the observations might have influenced how the 3 observed participants completed their implementation plans. Nonetheless, by triangulating the data collected from different sources, efforts were made to minimize this potential bias. Involving a second researcher in the analyses of the qualitative data further increased the rigor of this study. Furthermore, recall bias or the participants' misinterpretations of what actions were part of each step might have caused inaccurate estimations of the time it took to complete each step of the toolbox. This is reflected by the estimated time to complete Step 2, which ranged from 15 to 240 min. The fact that the participating nursing homes already had a task force on activity may be a limitation to the generalizability of the findings of this study. Moreover, although we tried to comply with existing definitions, our definition of dose (that is, the extent to which all of the steps of the TIP-toolbox were conducted by each participant) slightly deviates from existing definitions^{25,26} that state that dose entails how much intervention is delivered. Finally, we did not measure how the implementation plans were executed and whether this led to more promotion of functional activity. Hence, we cannot draw any conclusions on the effectiveness of the TIP-toolbox.

Implications

The findings of this feasibility study can inform nursing homes that want to implement innovations, in particular by using the TIP-toolbox. We recommend forming an implementation team, including the RNs responsible for the implementation in the wards, allied health professionals, and managers from the nursing home. Such collaboration may increase the feeling of support and facilitate the development of a structured implementation plan. Furthermore, it is important that the RNs working with the TIP-toolbox possess the necessary competencies; they should be able to collaborate, process information, and display leadership behavior.

This study has several implications for research. On the basis of the results of this feasibility study, the toolbox can be further improved. Future studies could then examine the effectiveness of the improved toolbox, that is, whether the use of the TIP-toolbox leads to the successful implementation of innovation. Further research could also examine the feasibility of the toolbox for implementing innovations not related to promoting functional activity or for implementing innovations in other health care settings than nursing homes, for instance in home care. This would require further adaptations to the TIP-toolbox, for example, regarding the tools that are used to measure current nursing behavior and barriers to innovation.

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References

- Dharamsi S, Jivani K, Dean C, Wyatt C. Oral care for frail elders: knowledge, attitudes, and practices of long-term care staff. *J Dent Educ.* 2009;73(5):581–588.
- Mody L, Saint S, Galecki A, Chen S, Krein SL. Knowledge of evidence-based urinary catheter care practice recommendations among healthcare workers in nursing homes. *J Am Geriatr Soc.* 2010;58(8):1532–1537.
- Meesterberends E, Wilborn D, Lohrmann C, Schols JM, Halfens RJ. Knowledge and use of pressure ulcer preventive measures in nursing homes: a comparison of Dutch and German nursing staff. *J Clin Nurs.* 2014;23(13–14):1948–1958.
- Segaar D, Willemsen MC, Bolman C, De Vries H. Nurse adherence to a minimal-contact smoking cessation intervention on cardiac wards. *Res Nurs Health.* 2007;30(4):429–444.
- den Ouden M, Kuk NO, Zwakhalen SMG, Bleijlevens MHC, Meijers JMM, Hamers JPH. The role of nursing staff in the activities of daily living of nursing home residents. *Geriatr Nurs.* 2017;38:225–230.
- Rahman AN, Applebaum RA, Schnelle JF, Simmons SF. Translating research into practice in nursing homes: can we close the gap? *Gerontologist.* 2012;52(5):597–606.
- Baker R, Camosso-Stefinovic J, Gillies C, et al. Tailored interventions to address determinants of practice. *Cochrane Database Syst Rev.* 2015;4:CD005470.
- Stewart GL, Manges KA, Ward MM. Empowering sustained patient safety: the benefits of combining top-down and bottom-up approaches. *J Nurs Care Qual.* 2015;30(3):240–246.
- Holleman G, van Tol M, Schoonhoven L, Mintjes-de Groot J, van Achterberg T. Empowering nurses to handle the guideline implementation process: identification of implementation competencies. *J Nurs Care Qual.* 2014;29(3):E1–E6.
- Thompson GN, Estabrooks CA, Degner LF. Clarifying the concepts in knowledge transfer: a literature review. *J Adv Nurs.* 2006;53(6):691–701.
- Grol R, Wensing M, Eccles M, Davis D. *Improving Patient Care: The Implementation of Change in Health Care.* Oxford: John Wiley & Sons; 2013.
- Bostrom AM, Slaughter SE, Chojcecki D, Estabrooks CA. What do we know about knowledge translation in the care of older adults? A scoping review. *J Am Med Dir Assoc.* 2012;13(3):210–219.
- Resnick B, Simpson M, Bercovitz A, et al. Testing of the Res-Care Pilot Intervention: impact on nursing assistants. *Geriatr Nurs.* 2004;25(5):292–297.
- Grönstedt H, Frändin K, Bergland A, et al. Effects of individually tailored physical and daily activities in nursing home residents on activities of daily living, physical performance and physical activity level: a randomized controlled trial. *Gerontology.* 2013;59(3):220–229.
- Resnick B, Gruber-Baldini AL, Zimmerman S, et al. Nursing home resident outcomes from the res-care intervention. *J Am Geriatr Soc.* 2009;57(7):1156–1165.
- Peri K, Kerse N, Robinson E, Parsons M, Parsons J, Latham N. Does functionally based activity make a difference to health status and mobility? A randomised controlled trial in residential care facilities (The Promoting Independent Living Study; PILS). *Age Ageing.* 2008;37(1):57–63.
- den Ouden M, Bleijlevens MH, Meijers JM, et al. Daily (in)activities of nursing home residents in their wards: an observation study. *J Am Med Dir Assoc.* 2015;16(11):963–968.
- Palese A, Del Favero C, Antonio Zuttion R, et al. Inactive residents living in nursing homes and associated predictors: findings from a regional-based, Italian retrospective study. *J Am Med Dir Assoc.* 2016;17(12):1099–1105.
- Polit DF. *Nursing Research: Generating and Assessing Evidence for Nursing Practice.* Philadelphia: Wolters Kluwer Health; 2017.
- Eldridge SM, Chan CL, Campbell MJ, et al. CONSORT 2010 statement: extension to randomised pilot and feasibility trials. *BMJ.* 24 2016;355(1):i239.
- Critical Appraisal Skills Programme. CASP Qualitative Research Checklist, http://media.wix.com/ugd/dde87_29c5b002d99342f788c6ac670e49f274.pdf; 2013. Accessed 24 October 2016.
- Verbeek H, Zwakhalen SM, Schols JM, Hamers JPH. Keys to successfully embedding scientific research in nursing homes: a win-win perspective. *J Am Med Dir Assoc.* 2013;14(12):855–857.
- Kuk NO, Zijlstra GAR, Bours GJJW, Hamers JPH, Kempen GJMM. Development and usability of the MAINTAIN, an inventory assessing nursing staff behavior to optimize and maintain functional activity among nursing home residents: a mixed-methods approach. *BMC Health Serv Res.* 2016;16(1):38.
- Kuk NO, Bours GJJW, Zijlstra GAR, Hamers JPH, Kempen GJMM. Translating implementation strategies into practice to enable nursing staff to implement innovations. *J Adv Nurs.* 2016;72(suppl 1):87.
- Moore GF, Audrey S, Barker M, et al. Process evaluation of complex interventions: Medical Research Council guidance. *BMJ.* 2015;350:h1258.
- Saunders RP, Evans MH, Joshi P. Developing a process-evaluation plan for assessing health promotion program implementation: a how-to guide. *Health Promot Pract.* 2005;6(2):134–147.
- Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res.* 2005;15(9):1277–1288.
- Bowman J. Challenges to measuring outcomes in occupational therapy: a qualitative focus group study. *Br J Occup Ther.* 2006;69(10):464–472.
- Marsland E, Bowman J. An interactive education session and follow-up support as a strategy to improve clinicians' goal-writing skills: a randomized controlled trial. *J Eval Clin Pract.* 2010;16(1):3–13.
- Ploeg J, Davies B, Edwards N, Gifford W, Miller PE. Factors influencing best-practice guideline implementation: lessons learned from administrators, nursing staff, and project leaders. *Worldviews Evid Based Nurs.* 2007;4(4):210–219.
- Jun J, Kovner CT, Stimpfel AW. Barriers and facilitators of nurses' use of clinical practice guidelines: an integrative review. *Int J Nurs Stud.* 2016;60:54–68.
- Grol R, Wensing M. What drives change? Barriers to and incentives for achieving evidence-based practice. *Med J Aust.* 2004;180(6 suppl):S57–S60.
- Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O. Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Q.* 2004;82(4):581–629.
- Bleijlevens MH, Gulpers MJ, Capezuti E, van Rossum E, Hamers JP. Process evaluation of a multicomponent intervention program (EXBELT) to reduce belt restraints in nursing homes. *J Am Med Dir Assoc.* 2013;14(8):599–604.
- Harrington C, Choiniere J, Goldmann M, et al. Nursing home staffing standards and staffing levels in six countries. *J Nurs Scholarsh.* 2012;44(1):88–98.
- Spilsbury K, Hewitt C, Stirk L, Bowman C. The relationship between nurse staffing and quality of care in nursing homes: a systematic review. *Int J Nurs Stud.* 2011;48(6):732–750.
- Terpstra D, Van den Berg A, Van Mierlo C, et al. *Toekomstbestendige beroepen in de verpleging en verzorging*; 2015.
- Rogers EM. *Diffusion of Innovations.* 5th ed. New York: Free Press; 2003.