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Improving and supporting quality of care in Dutch nursing homes: a quantitative study

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Abstract

Background Previous research showed the potential of quality improvement programs in nursing home care. However, studies that quantitatively evaluate the effectiveness of quality of care improvement programs are scarce. In this study, we examine the results of a Dutch nation-wide programme that was established to support the implementation of the Quality Framework for Nursing Home care.

Methods The Dignity & Pride at every Facility (D&PF) program was accessible to all Dutch nursing home facilities. Problem analysis per facility was conducted by means of a quantitative Quality Scan targeting all eight themes of the quality framework. Based on the baseline measurements nursing home facilities received tailored support from an external expert coach. The Quality Scan was repeated at the end of the support trajectories, 9 to 24 months later depending on the type of support provided. Scan data of 331 nursing home facilities was used to quantify the effectiveness of the D&PF program, the contribution of tailored support and the influence of organizational factors on care outcomes.

Results The entire pool of participating facilities scored better on the final scan (M = 3.21, SD = 0.74) than on the baseline scan (M = 2.64, SD = 0.87, $p < 0.001$). Greater improvements on theme level were seen when (partial) support was provided by an external expert coach. The probability of achieving high scores on care outcomes (person-centred care, resident safety and well-being) was significantly increased with high scores on organizational conditions. A multilevel model demonstrated that the themes Learning and improvement, Responsive workforce and Use of resources were statistically significant associated with positive care outcomes.

Conclusion This study demonstrates significant improvements across all themes of the quality framework and provides supporting evidence for the positive contribution of tailored on-site support of external expert coaches. This study also indicates that a supportive organizational environment and a learning-oriented culture are of significant importance for good care outcomes in terms of safety, person-centred care and resident well-being.

Keywords Person-centred care, Resident safety, Nursing homes, Quality improvement, Organizational changes, Organizational conditions, Learning culture

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Background

The challenge of quality of care in nursing homes

An ageing population, an increasing number of people with complex care needs, and labour market shortages impede both the quality and sustainability of care for older people [1–3]. In the Netherlands, the number of individuals aged 75 and above will increase considerably in the coming years. It is estimated that the percentage of people over 75 years of age will grow by around 80% between 2040 compared to 2024 [4]. If the demands of care remain unchanged and professionals provide care as they do now, almost 7% of the Dutch working population will have to work in care for older people by 2040; this was 3% in 2016 [5].

In addition to these developments, providing high-quality care for residents has been a significant challenge for nursing homes (NHs) for an extended period of time. High staff turnover, limited resources and limited availability of qualified staff are major contributors to this challenge [6, 7]. The quality of care in NHs encompasses not only physical support and nursing care according to guidelines, but also requires a significant focus on person-centred care and quality of life. From this perspective aspects such as autonomy, dignity, comfort, and meaningful activities and relationships are of high importance. Excessive attention to safety guidelines may have a detrimental effect on the quality of life experienced by residents. For instance, measures designed to prevent falls can limit residents' freedom. Consequently, the quality of care in NH is characterized by a constant trade-off between safety and quality of life, which gives rise to dilemmas and challenges for care workers [8, 9].

Quality improvement in nursing homes

A common strategy for stimulating quality improvement is to define standards for (high)-quality care and to hold care home organizations accountable for meeting these standards [10, 11]. In accordance with this approach, numerous initiatives have been undertaken with the objective of improving the quality of care over the past few decades. In Europe, various support programmes have been initiated with the objective of improving resident safety [12–14]. These traditional approaches to quality improvement focus on identifying (safety) problems such as risk of falls and infections, and developing strategies to improve and prevent their recurrence [9]. Previous studies on quality improvement in NHs have concentrated on standards for resident safety or clinical outcomes, including pressure ulcers, the risk of falls, pain and the use of antipsychotic drugs showing improvements and compliance with standards [15].

However, this traditional approach with a focus on quality measures and standards does not represent the quality of life of the people involved, which varies according to context and individual preferences and needs [16, 17]. To better address this contextual and subjective nature of quality of care, we must consider broader processes and conditions related to learning and improvement of the quality of care [8, 9]. Several previous studies have focused on the (organizational) conditions that facilitate the process of learning and quality improvement in health care. These studies indicate that staff characteristics, leadership from top management, organizational culture, care worker motivation, open communication, data infrastructure and information systems, and a supportive environment for learning and quality improvement are key factors influencing the success of quality improvement initiatives [18–22].

In line with these factors, Vaughn and colleagues identified several characteristics of healthcare organizations that struggle to improve their quality of care. These include an organizational culture that is characterized by limited ownership, a lack of collaboration, a hierarchical structure and disconnected leadership, limitations in staffing, information technology or resources [23]. Johannessen et al. hypothesize that increased external pressure on the healthcare sector will constrain the ability to maintain quality and safety in NHs [24]. When healthcare workers are confronted with heavier workloads and diminished resources, the delivery of high-quality care will be even more challenging. This underscores the necessity for greater focus on the organizational conditions for high quality care and the development of strategies to enhance these supporting conditions.

Implementing the Dutch quality framework for nursing home care

In the Netherlands, a new quality framework for nursing home care was launched in 2017. The Dutch Quality Framework for Nursing Home Care (QF-NH) outlines eight key themes that describe the standards of care that residents and relatives can expect from NHs (see Fig. 1) [25]. The QF-NH adopted a whole-system approach by explicitly addressing person-centred care and by placing learning and improvement and organizational conditions as fundamental starting points for quality of care. With the introduction of this framework, NHs were responsible not only for meeting quality standards for resident safety and person-centred care, but also for creating a culture of continuous learning and improvement and organizational conditions for quality of care in the broadest sense.

Implementing quality standards and improving organizational conditions in NHs is, however, far from straightforward. High staff turnover and limited resources make the implementation of this quality framework especially challenging. Besides this, organizational conditions such as (personal) leadership, governance and availability of

Fig. 1 Dutch Quality Framework for Nursing Home care (QF-NH)

resources are interrelated. Improvement of these conditions asks for complex interventions that pay attention to the behaviours of staff and residents. Behaviours, on the other hand, are built on and interact with the organizational conditions, and new issues can arise as a result of the interventions [26, 27].

The dignity and pride at each facility programme

In order to address quality issues in Dutch nursing homes, the Ministry of Health, Welfare and Sport (VWS) initiated a national support programme with the objective of initiating a shift towards improvements in NH care. As a part this broader approach, the programme Dignity and Pride at each Facility (D&PF) was established to facilitate the implementation of the quality framework. Vilans, the Dutch Center of Excellence for Care and Support, was responsible for the execution of the programme. The D&PF operated from September 2019 to December 2023.

The design of the D&PF programme was based on experience gained from previous Dutch programmes in long-term care [28–30] and the previous Dignity and Pride

(D&P) program [31]. The D&PF programme included the same elements as the D&P programme, including commitment of the board of directors and senior leaders of the NH organization, comprehensive system-level problem analysis, development of an improvement plan, extensive tailored support by external expert coaches, and adaptation of interventions to the local context. The improvement process was evaluated twice; once interim and once at the end (see Table 1). In addition, the design of the D&PF programme was intended to enhance NH employees' understanding, awareness and motivation to adhere more closely to the quality framework, and to reinforce the facility's culture of continuous learning and improvement. Finally, dissemination of knowledge and the provision of support were specifically focused on the eight themes of the framework and their application in daily practice (see Fig. 1).

Aim of this study

Previous studies demonstrated the success and possibilities of large-scale quality improvement programs in the Netherlands [28, 30, 31]. The study by Vermunt et al. showed that support by external expert coaches contributed significantly to the improvement of resident safety and person-centred care [31]. Despite these results, the data of this previous study did not allow for the examination of organizational conditions and how these are related to high quality care.

This article therefor focuses on organizational conditions and how these are related to high quality care provided to vulnerable individuals living in NHs. For this, we examine the results and effectiveness of the D&PF programme using quantitative data from 331 NH facilities.

The overall objectives of this study are: (1) to examine changes on the eight themes of the Dutch QF-NH at facilities participating in the D&PF programme, (2) to evaluate the contribution of the D&PF programme by examining whether the degree of changes observed is related to the approach that was chosen to improve the themes and (3) to determine which of the conditional themes and underlying factors are related to positive outcomes in terms of safety, person-centred care, and resident well-being.

Methods

Enrolment in the D&PF programme

All Dutch NH facilities were eligible for enrolment in the D&PF programme. Vilans announced the programme via their newsletter and website and set up a registration process for this purpose. Facilities signed up to the programme on a voluntary basis. As the programme was funded by the Ministry of Health, Welfare and Sports, participation was free of charge. However, in order to participate, NHs were required to demonstrate their commitment at the CEO level, appoint an internal project leader and commit time. Vilans made agreements with the participating NH facilities, including the agreement that NH facilities were obligated to repay all expenses if they failed to adhere to the programme agreement and/or withdrew from the support programme without sufficient reason. The participating NH facilities were located throughout the Netherlands and provided care for vulnerable older adults, a substantial proportion of whom suffered from dementia.

Nursing home facilities selection and categorization

In the D&PF programme, problem analysis and improvement plans were carried out at the level of the facility (instead of organization-level), which made it possible to take the local context into account. The problem analysis per facility was conducted by means of a Quality Scan involving the various stakeholders of the facility. Repeating this scan at the end of the support trajectory provided the opportunity to collect quantitative data to monitor progress. Based on the baseline measures, nursing home facilities could receive targeted support which was divided into different levels (Table 1).

In this study we only included those facilities that were assigned to a Plus or Intensive support trajectory (see Table 1). The No support category and Light support trajectories were excluded as in these trajectories support from the programme was either absent or limited. Consequently, these trajectories were considered unrepresentative of the potential efficacy of the customized support provided by the D&PF programme.

Study setting, design and data collection

The data were collected between September 2019 and June 2023. For each participating NH facility, a baseline and final Quality Scan was conducted by using the revised version of the QEQ-NH (see Table 1) [32]. This instrument was developed in 2019 by and was based on an earlier version of the QEQ-NH. The instrument includes the themes and subjects in the Dutch National Quality Framework for nursing home care presented in statements [34]. Examples include statements about person-centred care (Care professionals pay enough attention to residents and their needs. This means that they personally connect, get involved and listen carefully to what residents say) and statements about resident safety (Specialized and risky procedures are only performed by care professionals who have the right training and are authorized to do so) (see Appendix 1). Respondents are asked to indicate the level of agreement on a five-point Likert scale, with 1 representing the most negative response and 5 the most positive. Higher scores indicate more favourable situations. The Likert scales are

Table 1 Components of the support trajectories of the D&PF programme

Baseline and final Quality Scan

Participation in the D&PF programme started with a Quality Scan. This scan provides an overview of the situation with respect to the quality framework at the facility and identifies areas for improvement. The execution of the Quality Scan was guided by two independent advisors who were selected by Vilans according to a strict selection procedure. The selection focused on key criteria including a minimum of five years of experience in advisory and change management in nursing home care, excellent communication and research skills and knowledge about, and expertise in health management and/or care processes. Two advisors were assigned to each scan, with one primarily focusing on the organizational conditions and the other primarily focusing on the care outcome themes. The results of the baseline scan were used as the basis for the action plan for the facility. A final scan was conducted at the end of the trajectory to assess the results and to identify further areas for improvement. The scans consists of several components:

Self-evaluation questionnaires:

As a first step, all personnel, residents, relatives, volunteers and managers were invited to complete the revised version of the Quality Evaluation Questionnaire for Nursing Homes (QEQ-NH) [32] to share their experiences regarding the quality of care and conditions for quality of care at the facility. In the questionnaire, the eight key themes from the Quality Framework are translated into various statements (topics).

The questionnaire was modified for each stakeholder group. The development of the questionnaire was informed by the execution of interviews with the various stakeholder groups. When the questionnaire was distributed, each stakeholder group was invited to complete the questionnaire. Significant emphasis was placed on internal communication and the explanation of the importance of including the perspectives and voices of the different stakeholder groups. (See Appendix 1 for questionnaire topics per theme of the QF-NH).

Analysis and interpretation:

Second, the results of the self-evaluation questionnaires were analysed and interpreted by the two independent advisors. During the time the questionnaire was open, they also monitored the response rate. The quality dialogue sessions could only be held when the response on the questionnaire was acceptable (with all of the stakeholder groups included, minimum overall response rate of 30%). If this was not the case, they undertook steps to increase the response rate. After the questionnaire was closed, the independent advisors assigned initial scores to each of the topics of the questionnaire and themes of the QF-NH. The scoring system was based on the traffic light model, ranging from red (indicating serious issues, to dark green, denoting outstanding performance). In the process of assigning these scores, particular attention was paid to any discrepancies between the experiences of different groups of respondents, the explanations provided to the questions, and information contained in other available documents. The extent to which the resulting image corresponds to the national quality standards (the quality framework) was then examined. Topics where there is little consensus, or topics that were assessed predominantly negatively or positively, were further discussed in the quality dialogue session.

Quality dialogue:

Third, a quality dialogue was organised at each facility. Care workers, team leaders, family/ resident representatives, volunteers, and the facility manager were invited to participate. In the quality dialogue the results of the self-evaluation questionnaires were discussed, with the guidance of the two independent advisors. They collectively assigned a colour code based on the traffic light model ranging from red (serious issues) to dark green (outstanding). If now consensus was reached, the advisors assigned the definite score.

Scan report:

The colour codes, and the associated considerations, were recorded in a scan report. This report served as the foundation for the subsequent support trajectory and monitoring.

Feedback session:

Following the quality dialogue, the board of the NH organization was informed about the findings. Furthermore, the board endorsed the outcomes and the subsequent improvement process. The desirability of a support trajectory and its preferred intensity level were discussed with the board.

Assigning support at facility level

Based on the baseline results, NH facilities could receive support at three levels:

Light support: The location was linked to a one of the so-called knowledge managers at Vilans, who acted as a sparring partner for the facility manager of an internal project leader of the NH. They shared available knowledge on specific topics or facilitated connections between the facility and other NH organizations to exchange experiences. Support was limited to a few consultations.

Plus support: The facility received support from an expert coach addressing on average 3 themes within the QF-NH (e.g. Resident safety care and/or Responsive workforce). The duration of the Plus support trajectories was up to nine months, with a final scan conducted at the end of the trajectory.

Intensive support:

On average, these trajectories involved the support from one or more expert coaches across a total of 5 themes from the quality framework. The trajectories had a duration of 18 to 24 months, ending with a final scan.

Improvement plan and tailoring support at theme level

In the Plus and Intensive support trajectories, the baseline scan was used to determine which themes should be prioritized. For these themes the expert coach formulated a plan of action together with the facility manager and other relevant stakeholders. In addition, facility managers could decide to direct attention to themes that were not addressed by the expert coaches, conducting interventions to these themes independently (parallel to the actions that were undertaken to enhance the themes that were prioritized by the scan).

The plan of action could include interventions necessary to improve the care outcome themes, such as instructions for or renewed focus on the use of the electronic client dossier, improvements in the work processes for hygienic working, coaching focused on working according to the resident's care plan, or enhancing the effectiveness of care team meetings. The plan of action could also include interventions aimed at improvement of the conditional themes. These interventions for example focused on developing a culture of learning and improvement, the implementation of the organization's vision, or on restructuring the organization.

Implementation and monitoring progress:

During the implementation phase the external expert coaches provided supported the implementation of the planned interventions. Although exact intervention strategies varied across trajectories, they were conducted in line with the Plan Do Check Act (PDCA) cycle, covering four stage: (1) gaining insight into the current situation; (2) envisioning the desired situation and setting goals accordingly; (3) translating the derived vision and goals into an operational plan; and (4) implementing change and reflecting on the results [31, 33]. The implementation strategies and improvements of each organization were continuously monitored by the expert coaches and a D&PF programme coordinator, adaptions made throughout the process if needed.

Final evaluation and lessons learned:

At the conclusion of each organization's participation in the programme, a final evaluation form was completed by the expert coaches and facility manager. In addition, an evaluation session was conducted involving care professionals, the facility manager, the expert coaches and a programme coordinator. The purpose of this evaluation was to assess the organization's progress in relation to the framework and to identify lessons learned (see Fig. 2).

In June 2021, the final evaluation form was updated to ask the expert coaches for which they had provided support and for which themes the facility had conducted independent work. The following answers per theme were possible: (1) Support from the expert coach on the theme during the trajectory, (2) Partial support from the expert coach, (3) Independent work on the theme by the facility during the trajectory (without support from the expert coach) or (4) No attention was paid to the theme during the trajectory.

Fig. 2 Design of the D&PF improvement trajectories and data collection

commonly considered robust for calculating averages and performing statistical analyses [35].

Data on the degree of support on the theme level was only available for trajectories completed after June 2021. Furthermore, for some trajectories the final evaluation form was not completed for various reasons, or was answered incorrectly (e.g., multiple answers selected or free-form answer). Consequently, the set of trajectories with a baseline and final scan score and a final evaluation form is a subset of the total pool of D&PF participants. In this longitudinal study we analyse the data that were collected in these Plus and Intensive improvement trajectories with a baseline and final scan ($N = 331$).

Analysis strategies

Changes on the themes of the QF-NH

To assess whether the quality of care at facilities had improved, we compared the baseline and final scan scores on the eight themes of the QF-NH. We assessed whether the final scores collectively differed from the baseline scores in the Plus and Intensive support trajectories (resp. $N = 159$ and $N = 172$) using multivariate T-tests. Furthermore, we tested whether the improvements differed between Plus and Intensive support trajectories. Parametric assumption checking revealed several violations of assumptions, specifically regarding univariate and multivariate normality of baseline and final scores and homoscedasticity. To address the violations of parametric assumptions, we elected to adapt the parametric multivariate Hotelling's T^2 test into a nonparametric (distribution-independent) permutation test. This entailed permuting the final and baseline score labels in order to construct a null distribution of the test statistic itself. This distribution resembles the expected situation if the null hypothesis (e.g., there is no difference between baseline and final scores) is true. If the observed Hotelling's T^2 statistics lies outside the inner 95% of the distribution, we reject the null hypothesis. The analysis included multivariate comparisons of the mean of the scores on the eight themes. The individual theme effects are presented in figures.

Approach per theme related to the outcomes

To ascertain whether there was a significant difference in baseline and final scan scores between participants with a final evaluation form ($N = 194$) and without a final evaluation ($N = 137$), we conducted a Mann-Whitney U (non-parametric *t*-test) on scores pooled across themes. The results indicated that there was no significant difference between baseline scores ($p = 0.14$). However, a significant difference was observed in final scan scores ($p < 0.001$), with facilities who had filled out a final evaluation form demonstrating significantly higher final scan scores than those without a final evaluation form. Consequently, the findings of analyses based on data from the final evaluation form group may be overestimated in comparison to the full pool of participants. It is therefore important to consider this when interpreting the results.

To examine whether the degree of improvement was related to the approach that was chosen at the facility for the specific themes, we conducted the non-parametric equivalent of ANOVA, a Kruskal-Wallis test. The test evaluated for statistical differences in deltas (final minus baseline scan scores) across all approach categories: (1) support from the expert coach on the theme, (2) Partial support from the expert coach, (3) Independent work on the theme by the facility and (4) No attention was paid to the theme. As post-hoc testing of differences between these categories, we conducted a non-parametric Mann-Whitney U test. To preserve statistical power, data from different themes with the same approach category were pooled. Furthermore, the Plus and Intensive trajectories were combined, as there were no grounds for differentiating between them. The support provided per theme is presented in Appendix 2.

Organizational conditions related to care outcomes

We examined whether scores on the organizational conditions-related themes (Learning and improvement, Leadership, governance and management, Responsive workforce, Use of resources and Use of information) were related to the themes of Resident safety, Person-centred care, and Resident living and well-being. We define these latter outcomes as 'care outcomes'. We first examined whether the organizational conditions were conducive or essential for positive care outcomes. To do this, we created cross-tabulations of the number of high (> 3 on Likert scale) and low ($\leqq 3$ on Likert scale) scores for both the baseline scores and final scores on the Quality Scan. This analysis included all trajectories with complete theme scores on both the baseline and final scan ($N = 325$).

In addition, we analysed which of the organizational conditions were significantly related to positive care outcomes. To this end, we defined an outcome score for each trajectory, consisting of the mean final scan score on the care outcome themes ($N = 325$, mean = 3.47, SD = 0.51). For the analysis, we selected a multilevel model, specifically a Linear Mixed Model (LMM), to account for the

hierarchical structure of the data, with participating facilities nested within organizations. This nesting leads to dependence between observations within the same organization, which can result in underestimated standard errors if not properly addressed. The intraclass correlation coefficient (ICC) was 0.308, indicating that 30.8% of the variance in the combined care outcome was attributable to differences between organizations, thereby supporting the use of a multilevel approach. The multilevel approach corrects the standard errors, ensuring that accurate inferences can be drawn [36]. In this model, final scan scores regarding the organizational conditions were selected as predictors.

For those themes that appear to be significantly related to positive care outcomes, subsequent LMM models were computed with the underlying questionnaire topics as separate predictors (see Appendix 1). This supplementary analysis enables the identification of supporting factors that are associated with better care outcomes at the NH facilities. All topics within the theme were simultaneously included as predictors in the model. Separate models were constructed for each significant theme. This analysis included all trajectories with complete topic scores on both the baseline and final scan ($N = 298$).

Benjamini-Hochberg multiple comparison correction was applied when testing multiple related hypotheses with the false discovery rate (FDR) set to 0.05 [37]. Descriptive statistics are always given as mean +/- SD.

Results

Participating NH facilities

A total number of 542 NH facilities participated in the D&PF programme between September 2019 – June 2023. This number represented 23.0% of all NH facilities in the Netherlands. In several instances, multiple care teams from a single facility participated in the programme separately.

The facilities were part of $N = 181$ NH organizations with the number of facilities ranging from one to thirty. A total of 96 small organizations (one facility) participated (53.0%). Sixty-two organizations with two to five facilities participated (34.3%). Fourteen organizations of moderate size, comprising between six and ten facilities participated (7.7%). And only nine large organizations (> 10 facilities) participated (5.0%). Moreover, the participating nursing home organizations were characterized by a high number of residents (approximately 170 residents per organization, and approximately 60 residents per facility), with a correspondingly high number of professional healthcare employees, including (para)medical, auxiliary, and psychosocial staff (on average 200 care professionals and therapists per organization). A slight majority of the participating NH organizations were located in the western urban areas of the Netherlands, with the remainder situated in more rural locations. The western urban areas comprise the provinces of North-Holland, South-Holland, Flevoland and Utrecht. These areas are characterized by the presence of several agglomerations of large cities, a concentration of industry and a high population density. In these areas, which are together also known as 'the Randstad', the shortage of skilled NH personnel is greater than in rural areas, while the number of older people requiring nursing home care is increasing at a similar rate.

We excluded trajectories from our pool of participants that: (1) received support in a markedly different manner from the D&PF procedure (e.g., targeted support during COVID-19 pandemic, facilities that joined an existing organization-wide action plan without undergoing a Quality Scan, facilities that received emergency support prior to conducting a Quality Scan), or (2) were split, merged or otherwise intensively rearranged during their participation in the D&PF programme, impeding comparison between first and final scans ($N = 22$). After completing the Quality Scan, 67 facilities (12.8%) decided not to participate in a support trajectory and 47 facilities (9.0%) elected for light support. These facilities were also excluded in this study. From the NH facilities that elected for Plus or Intensive support $N = 75$ NH facilities were found to be lacking an adequate baseline or final scan, and thus could not be used for the analyses. This resulted in $N = 159$ Plus support trajectories and $N = 172$ Intensive support trajectories that were eligible for this study. These facilities were part of a total of 148 NH organizations, their geographical location and the formation of these of facilities did not differ from the total group of participating NH organizations (see flowchart in Appendix 3).

Improvements on the themes of the QF-NH

To examine improvements on the eight themes of the QF-NH, a nonparametric multivariate Hotelling's T2 test was conducted for both Plus ($N = 159$) and Intensive trajectories ($N = 172$) for which baseline and final scan scores were available. This test revealed that final scan scores ($M = 3.21$, $SD = 0.74$) were significantly higher than baseline scan scores for the entire pool of participants ($M = 2.64$, $SD = 0.87$, $T^2 = 371.43$, $p < 0.001$, $N = 331$). This was also the case for the Plus support group ($M_{final} = 3.31$, $SD = 0.74$ vs. $M_{baseline} = 2.88$, $SD = 0.81$, $T^2 = 160.35$, $p < 0.001$) and Intensive support group separately ($M_{final} = 3.11$, $SD = 0.74$ vs. $M_{baseline} = 2.41$, $SD = 0.85$, $T^2 = 242.65$, $p < 0.001$).

Although the mean final scan score of the Intensive trajectories was lower than that of the Plus trajectories (3.11 vs. 3.31), participants in the Intensive group demonstrated greater improvement than those in the Plus support group, as indicated by larger differences between

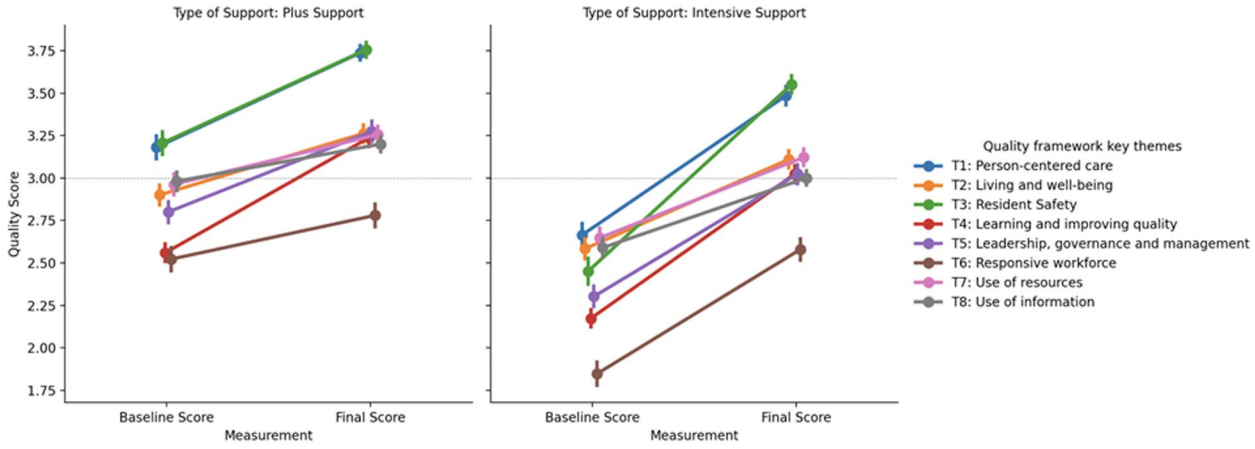

Fig. 3 Change in baseline vs. final scan scores on the eight quality themes, for Plus and Intensive support trajectories. *Error bars depict standard error (SE)

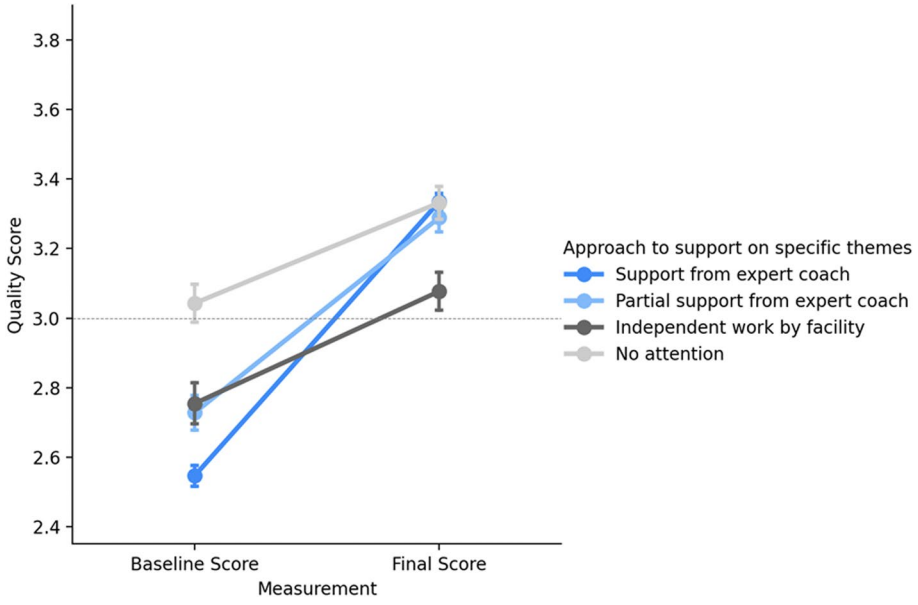

Fig. 4 The relation between approach to support per theme and the improvement of quality scores. *Error bars indicate the standard error (SE)

baseline and final scan scores ($M_{intensive}$= 0.70, SD = 1.05 vs. M_{plus}= 0.43, SD = 0.93, T^2 = 29.58, p < 0.001) (see also Fig. 3).

Approach per theme related to the outcomes

To evaluate the relation between the approach per theme and the improvements observed in the themes, we used the subset of trajectories with a baseline and final scan score and a final evaluation form (N = 194). Significant differences in improvements were found between the different support categories for the full pool of themes (H = 70.07, p < 0.001), as well as for the care outcomes themes T1-T3 (H = 14.25, p = 0.002) and for the conditional themes T4-T8 (H = 59.38, p < 0.001) separately.

The results of the non-parametric Mann-Whitney U test indicated that there were statistically significant differences in improvement between all pairwise combinations of approach per theme, except for the categories "Independent work by facility" vs. "No attention was paid to the theme". The results are presented in Fig. 4. The "No attention" category exhibited the highest baseline score, while the "Support from expert coach" category demonstrated the lowest baseline score. The "Partial support from expert coach" and "Independent work by facility" categories were found to be similar and moderate in comparison to the other categories. These findings indicate that all categories demonstrated improvement at the time of the final scan. The degree of improvement observed between the baseline and final scan scores is significantly influenced by the degree of support provided by the expert coaches. The greatest degree of improvement was observed in the "Support from expert" category, while

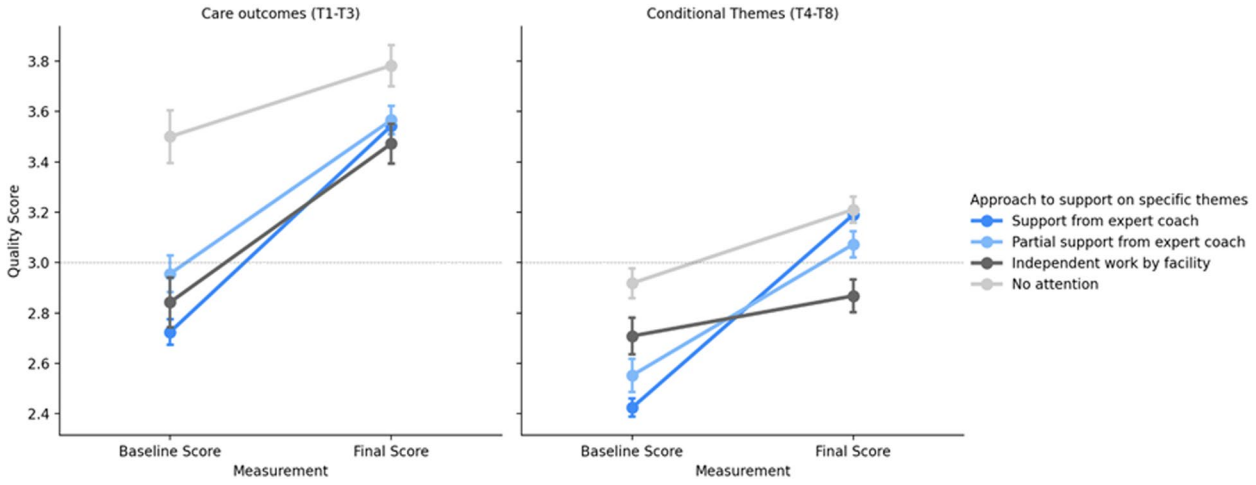

Fig. 5 The relation between approach to support per theme and the improvement of quality scores, for care outcomes and organization conditional themes separately. *Error bars depict standard error (SE)

Table 2 Cross-tabulation of the counts for high and low scores on the themes T1-T3 (care outcomes) and themes T4-T8 (organizational conditions) at the time of the baseline scan (*N* = 406)*

	T1-T3 high	T1- T3 low	OR (95%CI)
T4-T8 high	53 (13,1%)	19 (4,7%)	
T4- T8 low	111 (27,3%)	223 (54,9%)	
			5.58 (3.08–10.49)

*all trajectories with a baseline scan score were included

Table 3 Cross-tabulation of the counts for high and low scores on the themes T1-T3 (care outcomes) and themes T4-T8 (organizational conditions) at the time of the final scan (*N* = 331)*

	T1-T3 high	T1- T3 low	OR (95%CI)
T4-T8 high	135 (40,8%)	4 (1,2%)	
T4- T8 low	116 (35,0%)	76 (23%)	
			21.95 (7.87–85.14)

*All trajectories with a final scan score were included

the lowest degree of improvement was observed in both the "Independent work by facility" and "No attention" categories.

Figure 5 illustrates that the degree of improvement is comparable across the approach categories on the care outcomes (themes T1-T3). Conversely, the degree of improvement varies across approach categories on the conditional themes (T4-T8). Significant improvements in organizational conditions were observed at the final scan score in the "Support from expert coach" category, while moderate improvements were shown in the "Partial support from expert coach" category. No significant improvements in the organizational condition themes were observed for the "Independent work by facility" and 'No attention" categories. This finding indicates that the approach was a significant factor in enhancing organizational conditions, but a less crucial element in optimizing care outcomes. This suggests that the observed differences in improvement between the approach categories in Fig. 4 are predominantly attributable to variations in improvement in organizational condition themes.

No significant differences were observed between the scores on the baseline and final scan for those conditional themes that were coded as the 'Independent work by facility" and 'No attention" categories. Although the sample sizes of these categories are small, this could potentially indicate a lack of effective improvement on the organizational condition themes without support of an expert coach.

Organizational conditions related to care outcomes

Our third objective was to determine whether and which of the conditional themes and underlying supporting factors are related to positive care outcomes in terms of safety, person-centred care, and resident living and well-being (T1-T3). To ascertain whether the organizational conditions (T4-T8) are conducive or essential for positive care outcomes (T1 -T3) a cross-tabulation of the counts for scores above vs. equal to or below Likert scale 3 was

Table 4 Association between organizational conditions (T4 – T8) and care outcomes (composite scores of T1 – T3) in NH facilities participating in D&PF (*N* = 325)*

	B	SE	*p*-value
Intercept	1.539	0.142	< 0.001
Learning and improvement (T4)	0.235	0.035	**< 0.001**
Leadership, governance and management (T5)	0.056	0.034	0.100
Responsive workforce (T6)	0.160	0.029	**< 0.001**
Use of resources (T7)	0.144	0.036	**< 0.001**
Use of information (T8)	0.044	0.041	0.277

*For this analysis all trajectories having a baseline and final scan score were included. *N*= 6 trajectories were excluded because of missing theme score(s)

Table 5 Associations between the topics of the theme learning and improvement (T4) and care outcomes (composite scores of T1 – T3) in NH facilities participating in D&PF (*N* = 298)*

	B	SE	*p*-value
Intercept	1.173	0.187	< 0.001
Reflection on potential improvements	0.134	0.037	**< 0.001**
Sufficient time for consultation in teams	0.097	0.036	**0.006**
Care professionals can provide input for the quality plans	0.074	0.037	**0.044**
Quality management system that is supportive	0.109	0.038	**0.004**
Culture of learning and improvement	0.198	0.038	**< 0.001**
Care professionals have sufficient time to participate in a learning network	0.117	0.039	**0.003**

*All trajectories with a baseline and final scan score were included for this analysis. *N* = 33 trajectories were excluded because of missing topic scores

Table 6 Associations between the topics of the theme responsive workforce (T6) and care outcomes (composite scores of T1 – T3) in NH facilities participating in D&PF (*N* = 298)*

	B	SE	*p*-value
Intercept	0.925	0.208	< 0.001
Care professionals have the right skills and knowledge	0.197	0.036	**< 0.001**
Sufficient professionals to provide care	0.030	0.038	0.424
At least two care professionals present during intensive care moments	0.060	0.039	0.119
Supervision in the living room and common area	0.035	0.034	0.301
Residents are cared for by staff they know	0.051	0.034	0.134
Good teamwork	0.145	0.038	**< 0.001**
Training meets the needs of care professionals	0.025	0.040	0.525
Employees have enough time for training	–0.021	0.039	0.587
Annual performance and development review	0.100	0.028	**< 0.001**
Absenteeism due to illness is not a problem	–0.013	0.027	0.625
Staff turnover is not a problem	0.031	0.030	0.304
Care professionals enjoy going to work	0.134	0.047	**0.004**

*All trajectories with a baseline and final scan score were included for this analysis. *N* = 33 trajectories were excluded because of missing topic scores

created for both the baseline ($N = 406$) and final scores ($N = 331$) on the Quality Scan.

Tables 2 and 3 show the proportions of participants with high versus low scan scores on organizational conditions (T4-T8) and care outcomes (T1-T3). Chi-square contingency tests indicate a significant association between scores on the care outcome themes (T1 – T3) and scores on the conditional themes (T4-T8), for both baseline scan scores ($\chi^2 = 40.11$, $p < 0.001$) and final scan scores ($\chi^2 = 59.27$, $p < 0.001$). Furthermore, for baseline scores, the odds of those facilities that score high on care outcomes having high scores on organizational conditions is 5.58 times that of them having low scores on organizational conditions (95% confidence interval: 3.08 to 10.49) (see Table 2).

For final scan scores, the odds of facilities that score high on care outcomes having high scores on organizational conditions is 21.95 times that of them having low scores on organizational conditions (95% confidence interval: 7.87 to 85.14). The fact that the entire confidence interval exceeds 1 indicates that the probability of achieving high scores on care outcomes is significantly increased with high scores on T4-T8 (organizational conditions). The counts in Tables 2 and 3 reveal that high scores on organizational conditions are not a prerequisite for high scores on care outcomes. There are 111

Table 7 Associations between the topics of the theme use of resources (T7) and care outcomes (composite scores of T1 – T3) in NH facilities participating in D&PF (*N* = 298)*

	B	SE	*p*-value
Intercept	1.689	0.192	< 0.001
Evaluation of methods and practices on a regular basis	0.129	0.043	**0.003**
Materials and resources are available	0.151	0.037	**< 0.001**
Enough opportunities for using (innovative) technology	0.124	0.039	**0.001**
Facility services support the care professionals	0.072	0.040	0.072
Staff services support the care process	0.079	0.046	0.087

*All trajectories with a baseline and final scan score were included for this analysis. *N* = 33 trajectories were excluded because of missing topic scores

participants (27,3%) at the baseline and 116 participants (35%) at the end who have high T1-T3 scores without exhibiting high T4-T8 scores. This means that the organizational conditions (T4 – T8) are conducive but not essential for positive care outcomes.

A multilevel model (LMM) was conducted to examine the relationship between the average score on the care outcome themes (T1 -T3) as a composite outcome score and the organizational conditions themes (T4 – T8) as predictors. This analysis demonstrated that themes 4 (Learning and improvement), 6 (Workforce) and 7 (Use of resources) were significantly associated with care outcomes (see Table 4).

Separate LMM models were conducted for the themes of Learning and improvement (T4), Responsive workforce (T6) and Use of resources (T7) to examine which topics within the themes significantly contribute to better care outcomes. Table 5 indicates that all the topics of the Learning and Improvement theme were significantly related to better care outcomes.

Table 6 presents the associations between the topics of the theme Responsive workforce (T6) and care outcomes. The LMM results indicate that the topics 'Care professionals have sufficient knowledge and skills', 'Good cooperation in teams' and 'Annual performance and development review' were positively associated with care outcomes. The remaining topics within this theme were not found to be significantly associated with care outcomes. Notably, the presence of (permanent) staff, training, sick leave and staff turnover were not significantly related to care outcomes.

Table 7 presents the correlations between topics of the theme Use of resources and care outcomes. The LMM models indicate that the use of resources in the form of methodologies, practices, materials, tools and technologies is positively related to care outcomes. The role of supportive departments such as facility services, human resources and finance was not statistically significant related to care outcomes in the facilities participating in the D&PF programme.

Discussion

Effectiveness of the D&PF programme

This study examined how we can improve and support the quality of care provided to vulnerable individuals who live in nursing homes. We studied the results of a nationwide implementation programme, Dignity and Pride in every Facility (D&PF). In this programme, NH facilities received support from an expert coach for about 9 months on three or fewer selected themes of the Dutch Quality Framework for Nursing Home care (QF-NH) (Plus trajectories, *N* = 159) or Intensive support from one or more expert coaches for 18 to 24 months on four to eight themes of the Quality Framework (*N* = 172). The results demonstrated notable enhancements across all eight themes of the framework. The figures demonstrated that the greatest improvements were observed in the themes of Resident safety, Person-centred care and Learning and improvement.

These above findings of the D&PF programme are consistent with the preceding D&P programme that concentrated on NHs with urgent quality concerns [31]. In contrast to the previous D&P programme, the D&PF programme distinguished between Plus and Intensive support trajectories. Although the mean final scan score of the Intensive support group was lower than that of the Plus support group, the Intensive support group showed greater improvements than those in the Plus support group. Facilities in the Intensive support group faced more serious quality issues, they therefore received more intensive support from expert coaches on a larger number of themes, for a longer period of time.

How does D&PF compare to other approaches? Several approaches to quality improvement in health care have been implemented and studied [15, 38]. In addition, several nationwide programmes for nursing homes care have been successfully implemented in Europe in the recent years [12–14]. These approaches and programmes tend to focus on specific (care) outcomes such as palliative care, infection prevention or staff retention. D&PF on the other hand, simultaneously addressed a variety of

interrelated quality issues and organizational conditions. This whole-system approach is thought to be a prerequisite for successful and sustainable change [15, 38].

In this study we have shown that a whole system to change in NH facilities has indeed been successful. Promising results were achieved despite various challenges such as labour shortages and the Covid-19 pandemic, which offers hope for the quality and sustainability of the care for older people. However, the interventions, which were mainly implemented by means of external expert coaches are not easily replicated or disseminated by, for example e-learnings or publications, as the social components of the interventions, which are contextual and open to variation, may be essential [26]. This complex dynamic of implementation in daily practice means that substantial work and creativity may be required by adopters to translate interventions into their own settings. It may therefore be useful to share experiences between teams and organizations about management change and overcoming organizational barriers, as has been encouraged in the D&PF programme through the support of learning communities [39, 40].

Our dataset did not allow us to examine whether the results and improvements lasted in the long term. However, considerable attention was paid to the embedding of changes and new practices in the organization. For instance, the ownership of the changes and improvements was explicitly assigned to the organization and significant emphasis was placed on the development of competencies in the organization (e.g. leadership, management, learning and improvement skills).

Approach to support per theme related to the outcomes

For both the Plus and Intensive trajectories, the approach per theme was tailored, based on the results of the baseline scan and considerations of the facility manager and the expert coach(es). By doing this, the preferences and priorities of the facility manager were taken into account and an estimation was made of improvements that could be realized by the facility itself, without support of the expert coach. This means that the approach to the themes could vary between (partial) support by the expert coach, independent work efforts by the facility, or no attention was paid to the theme. As shown in Fig. 5, analysis indicated that the approach chosen was a significant factor in enhancing organizational conditions (T4 to T8), but a less crucial element in optimizing care outcomes (T1 – T3). This effect could be slightly overestimated since the subset of data of those NH facilities with a final evaluation form showed greater improvements than those NH facilities without a final evaluation form (and thus that were excluded from this analysis).

The results of the QEQ-NH and the dialogue sessions indicated quite clearly where improvement was needed. To make improvements, the external expert coach or an internal implementation coach or in some cases a project leader who was committed to the enhancements at the facility conducted additional analysis to (1) understand the problem thoroughly and (2) to fit solutions to address the problem, and (3) integrate those solutions into routine practice using PDCA-cycles. These quality improvement strategies engage local providers and staff and walk them through a systematic, multi-step approach to develop fit-for-purpose solutions that were most of the time within the coach or project leaders' circle of influence [15]. The results of our study show that, following this tailored approach, significant improvements were made, especially on the themes Person-centred care and Resident safety.

Improving conditional themes appear to be less straightforward, in part because they are, for the most part, organization-wide in scope. This can result in ambiguity regarding the precise changes required to enhance the conditional theme and requires multiple stakeholders to be involved in making these changes. For example, the standards for a culture of learning and improvement or a supporting leadership style are less easily defined than for medication safety. Less tangible interventions like these can be described as complex health care interventions, which means that they are subject to and interact with social mechanisms and underlying structures of the organization, and may evolve over time in unpredictable ways [26, 27]. In order to be effective, these interventions must be developed iteratively to adapt to the local context and respond to unforeseen barriers and unintended effects [21].

In the retrospective evaluation study of the D&P programme [31], the predecessor of D&PF, it was noted that the outsiders' view and independent position of the coaches helped the NH organizations to analyse the situation more objectively and, helped organizations stay committed to the quality improvement plans. Coaches repeatedly brought quality improvement goals and plans to the attention of the board, management and care professionals, facilitated communication within teams and between management and frontline staff, created safe and open environments for conversations, and uncovered long-lasting patterns between people [31]. These skills and interventions of the external expert coaches were also described in a systematic review conducted by Lofqvist as important attributes associated with the learning and improvement capacities of health care organizations [18].

The current study shows that it is worthwhile to distinguish between improvements in care outcomes, which may also be possible without or with only partial support from an expert coach, and the more complex interventions that are required to improve organizational

conditions, which appeared to be more difficult to achieve independently. For the latter, the support of an external expert coach lead to greater improvements than work done without the involvement of an expert coach.

The importance of organizational conditions for care outcomes

We investigated whether organizational conditions were essential or merely beneficial to care outcomes. The mean scores on the organizational conditions were found to be lower than the mean score of the care outcome themes, both at the baseline and at the conclusion of the trajectories (Fig. 1). Despite this, analysis showed that organizational conditions are of substantial importance for positive care outcomes. The probability of achieving high scores on care outcomes was significantly increased with high scores on organizational conditions. This finding is consistent with previous research indicating that these organizational conditions support the process of quality improvement, leading to better care outcomes [18, 19, 21, 22].

High scores on organizational conditions were, however, not essential for positive care outcomes since a substantial proportion of facilities had sufficient care outcomes while having low scores on organizational conditions. It is unclear, to what extent these facilities are able to sustain good care outcomes in the absence of these organizational conditions. Previous research has shown that a strong, congruent organizational culture in terms of shared goals, values and perceptions and a focus on learning are associated with organizational performance and sustained improvement [23, 41, 42]. It is important to note that the increasing external pressure on the care professionals due to the growing number of older people with complex care needs combined with labour market shortages will constrain the ability to maintain quality and safety in NHs [24]. As such, it is questionable whether improvements in care outcomes can be sustained without supportive organizational conditions.

Another research question was which of the organizational conditions are most important for good care outcomes. Analyses showed that some organizational conditions seem to be more important than others. The themes Learning and improvement, Responsive Workforce and Use of resources were significantly related to the care outcome themes (Person-centred care, Resident Safety, Residents' living and well-being). More precisely, all questionnaire topics of the theme Learning and improvement were significantly related to the care outcomes. Within the theme Responsive workforce only those topics focusing on knowledge and skills, cooperation, attention to development and job satisfaction were significantly related to care outcomes. Topics Sufficient and permanent staff, and Training courses were not significantly related. From the theme Use of resources those topics that relate to practical measures for the facilitation of care professionals in daily practice are significantly related to care outcomes. Remarkably, the theme Leadership, management and governance was not an independent factor related to care outcomes, while this appeared to be significant factor in several previous studies [19, 21, 22].

Our findings indicate that a supportive environment and an organizational learning orientation, in terms of enough time for and attention to reflection, evaluation, consultation and development as well as a cooperative culture, is conducive and valuable for good care outcomes in terms of safety and person-centred care.

The challenges in the care for older people, and NH care in particular, require new ways of working and the integration of innovations and new technologies into daily practice. A supportive environment and stimulation of learning and improvement is of great importance in this context [43–45]. However, this is a challenging endeavour, given the multifaceted nature of NHs, which are comprised of a diverse array of professionals with varying backgrounds and educational levels. Hierarchy often plays a role in these settings and the great variety in educational levels could hinder interprofessional learning [41, 43]. Also, since NHs face challenges in delivering complex, safe and person-centred care with limited staff, time for reflection, learning on the job, evaluation and professional development are not guaranteed [24, 43]. Despite such challenges, the theme of Learning and improvement showed the greatest degree of improvement at participating facilities, in addition to the themes of Resident Safety and Person-centred care. This may be attributed, at least in part, to the fact that the Learning and improvement theme received considerable attention from the expert coaches in almost every trajectory (in 95% of trajectories, see Appendix 3). These findings demonstrate that even in the context of increased external pressure (due to the Covid pandemic but also due to limited staff, increasing complexity of care and heavier workloads), improvements can be made. A culture of learning and improvement is only beneficial to care outcomes. Prior research indicates that a culture of learning and a supportive environment are also associated with higher levels of job satisfaction and greater staff retention, which further enhance the value of such a supportive and learning environment [46, 47].

Strengths and limitations

This study's key strengths include the unique large number of participating facilities ($N = 331$) in a nationwide programme, and the methodological approach based on the quality framework. The Quality Scan provided quantitative data at the outset and the conclusion of support

trajectories. The Quality Scan was designed in a comprehensive manner, incorporating the perspectives of care professionals, residents, relatives, volunteers and managers regarding the care outcomes and organizational conditions at the facility. The multi-step approach, (the analysis of the results of the questionnaire data by two independent experts followed by a quality dialogue), allowed the outcomes of the Quality Scan to be evaluated and validated and to be used to tailor support to the facility's needs. In addition, the participation of various stakeholders in the Quality Scan contributed to a shared view of the quality issues and a sense of urgency to improve them [34].

Our study also has some limitations. No longitudinal data were available to evaluate whether the improvements were made permanent. However, various strategies were applied to attempt to embed the realized changes into the organizational culture. These include ensuring coherence between the innovation and strategic policy of the organization, dividing tasks and responsibilities and involving leaders. These strategies have been shown to be effective to sustain organizational change and quality improvement [12]. However, the longevity of quality improvements is also dependent on supporting leadership, sufficient organizational resources, and the stability of staff [48], factors that are often represent challenges in the Dutch nursing homes.

Finally, we did not have any actual figures on staff shortages, absenteeism and data related to changes in the management of the organization. These factors might be important predictors for both the (conditions for) quality of care and the maintenance of the improvements that were achieved.

During the period in which these results were obtained, the Covid-19 outbreak occurred in the Netherlands, leading to nation-wide restrictions to control the spread of the disease. During the Covid-19 period, the D&PF programme provided additional support aiming at preventing infection and managing restrictions related to the risk of infection. This additional support was distinct from the support provided by the expert coaches who focused on the implementation of the QF-NH. During the Covid pandemic, the expert coaches were still able to provide on-site support at some facilities, but provided online support at others. We were not able to investigate the possible impact the Covid-19 pandemic and subsequent restrictions on the results of our study.

While this study demonstrated the efficacy of the D&PF programme design, we are unable to describe the precise improvement and change management strategies employed by the expert coaches, as the interventions used are contextualized and adapted the specific local context. The outcome of this process depends on the interactions and negotiations between their participants and contexts [49]. The expert coaches of the D&PF programme played a crucial role in this process, and our findings suggest that this is particularly salient when enhancing organizational conditions. As a result, like other QI reports we share the process utilized to achieve the improvements, rather than the solutions themselves [15, 38]. Although the interventions – being so customized – cannot be replicated exactly, we believe that the design and process used in the D&PF programme are promising and deserve replication in other NH settings. Future research could focus on identifying the components and interventions that have the most impact on improvement of both care outcomes and organizational conditions. Finally, research into the exact skills and competencies of coaches is recommended to make the support even more effective.

Conclusions

The results of this study showed significant improvements in all eight themes of the Dutch QF-NH at the facilities that received support from the D&PF programme. The data indicated that the most significant improvements were observed in the themes of Resident safety, Person-centred care, and Learning and improvement. Further analysis revealed that the greatest degree of improvement was observed in those themes of the Quality Framework in which the expert coaches were (partially) involved. The tailored on-site support provided by the expert coaches was an important factor, in particular with respect to the enhancement of organizational conditions. Organizational conditions, especially those related to the themes Learning and improvement, Responsive workforce and Use of resources, were important supportive factors for good care outcomes. These organizational conditions present a major challenge in many NHs, evidenced by the participants' baseline scores on these themes. Nevertheless, the participating facilities were able to improve these supportive conditions with the assistance of the expert coaches, despite external pressures due to Covid-19, increased complexity of care, and staff shortages. While the on-site coaching by external expert coaches is costly and may not be feasible in all settings, this study demonstrated that the design of the D&PF included an effective strategy for improving both care outcomes and organizational conditions that play a central role in NH organizations.

Abbreviations

QF-NH	Quality Framework – Nursing Home care
D&P	Dignity and Pride
D&PF	Dignity and Pride at every Facility
QEQ-NH	Quality Evaluation Questionnaire Nursing Homes
T1	Theme 1 (care outcomes): Person-centered care
T2	Theme 2 (care outcomes): Living and well-being
T3	Theme 3 (care outcomes): Resident safety
T4	Theme 4 (organizational conditions): Learning and improvement

T5	Theme 5 (organizational conditions): Leadership, management and governance
T6	Theme 6 (organizational conditions): Responsive workforce
T7	Theme 7 (organizational conditions): Use of resources
T8	Theme 8 (organizational conditions): Use of information
PDCA	Plan Do Check Act

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12913-025-12640-w.

Supplementary Material 1.

Supplementary Material 2.

Supplementary Material 3.

Authors' contributions

BvdB and MZ were involved in the data collection and data management of the Quality Scan. BvdB, PV, MZ and MZZ conceived and designed the study. MZ and MZZ conducted the statistical analyses of the study. BvdB and PV drafted the manuscript and all authors were responsible for writing the manuscript and the final approval of the version to be published.

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Data availability

The datasets generated and/or analysed during the current study are not publicly available, but are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

All data were collected and handled in accordance with the relevant privacy protection guidelines. According to Dutch law our study does not fall under the remit of the 'Medical Research Involving Human Subjects Act' and no approval by a medical ethics committee was necessary [50]. This act is based on the Helsinki declaration of the World Medical Association and is executed by the Central Committee on Research Involving Human Subjects (CCMO). Respondents received information about the participation of the facility in the quality improvement programme and about the goals and content of the questionnaire. Verbal informed consent was obtained from respondents who completed a questionnaire anonymously, and their response expressed their willingness to participate. No email addresses, contact information and socio-demographic information of respondents were collected to ensure privacy and anonymity of respondents. Completing the questionnaires did not bring about a (temporary) change in the subject's lifestyle, questions were not psychologically probing [51, 52].

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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References

1. Michel JP, Ecarnot F. The shortage of skilled workers in Europe: its impact on geriatric medicine. Eur Geriatr Med Soc. 2020;11:345–7.
2. Joint report by the Social Protection Committee and the European Commission. Long-term care report: trends, challenges and opportunities in an ageing society. Volume 1. Luxembourg: European Union; 2021.
3. Eurostat. Ageing Europe, looking at the lives of older people in the EU. Luxembourg: European Union; 2020.
4. RIVM, Impact van de vergrijzing (infographic). 2019 Infographic Impact van de vergrijzing - augustus 2019| RIVM Accessed 24 Aug 2024.
5. Idenburg PJ, Hagelstein F, Haimé M, van Schaik M, Schoen T. Ouder worden 2040. Een transformatieagenda voor een ouder wordende samenleving. BeBright. 2022. https://www.ouderworden2040.nl/wp-content/uploads/2021/05/Publicatie-Ouder-Worden-2040.pdf. Assessed 19 Aug 2024.
6. Bunn F, Goodman C, Corazzini K, Sharpe R, Handley M, Lynch J, et al. Setting priorities to inform assessment of care homes' readiness to participate in healthcare innovation: A systematic mapping review and consensus process. Int J Environ Res Public Health. 2020;17:987. https://doi.org/10.3390/ijerph17030987.
7. Collier E, Harrington C. Staffing characteristics, turnover rates, and quality of resident care in nursing facilities. Res Gerontol Nurs. 2008;1:157–70. https://doi.org/10.3928/19404921-20080701-02.
8. Koksma JJ, Kremer JAM. Beyond the quality illusion: the learning era. Acad Med. 2019;94:166–9. https://doi.org/10.1097/ACM.0000000000002464.
9. Werner RM, Konetzka RT. Advancing nursing home quality Trouhg quality improvement itself. Health Aff. 2010;29:81–6. https://doi.org/10.1377/hlthaff.2009.0555.
10. Social Protection Committee and the European Commission. Long-term care report: trends, challenges and opportunities in an ageing society. European Union. Long-term care report - Publications Office of the EU (europa.eu). 2021. Accessed 19 Aug 2024.
11. Spasova S, Baeten R, Coster S, Ghailani D, Pena-Casas R, Vanhercke B. Challenges in long-term care in Europe: a study of National policies. European Commission; 2018. Report number: KE-01-18-637-EN-N. https://doi.org/10.2767/84573.
12. Veer de AJE, Fleuren MAH, Voss H, Francke AL. Sustainment of innovations in palliative care: A survey on lessons learned from a nationwide quality improvement program. J Pain Symptom Manage. 2021;61:295–304. https://doi.org/10.1016/j.jpainsymman.2020.07.035.
13. Devi R, Martin G, Banerjee J, Butlet L, Pattison T, Cruickshank L, et al. Improving the quality of care in care homes using the quality improvement collaborative approach: lessons learnt from six projects conducted in the UK and the Netherlands. Int J Environ Res Public Health. 2020;17:7601. https://doi.org/10.3390/ijerph17207601.
14. Badger F, Cliford C, Hewison A, Thomas K. An evaluation of the implementation of a programme to improve end-of-life care in nursing homes. Palliat Med. 2009;23:502–11.
15. Toles M, Colón-Emeric C, Moreton E, Frey L, Leeman J. Quality improvement studies in nursing homes: a scoping review. BMC Health Serv Res. 2021;21:803. https://doi.org/10.1186/s12913-021-06803-8.
16. Sion KYL, Heerings M, Blok M, Scheffelaar A, Huijg JM, Westerhof G, et al. How stories can contribute toward quality improvement in Long-Term care. Gerontologist. 2024;64:gnad084. https://doi.org/10.1093/geront/gnad084.
17. Wilberforce M, Challis D, Davies L, Kelly MP, Roberts C, Clarkson P. Person-centredness in the community care of older people: A literature-based concept synthesis. Int J Social Welf. 2017;26:86–98. https://doi.org/10.1111/ijsw.12221.
18. Löfqvist N. Enhancing capability for continuous organisational improvement and learning in healthcare organisations: a systematic review of the literature 2013–2022. BMJ Open Qual. 2024;13(2):e002566. https://doi.org/10.1136/bmjoq-2023-002566. PMID: 38569667; PMCID: PMC10989174.
19. Rantz MJ, Zwygart-Stauffacher M, Flesner M, Hicks L, Mehr D, Russell T, Minner D. Challenges of using quality improvement methods in nursing homes that need improvement. J Am Med Dir Assoc. 2012;13:732–8. https://doi.org/10.1016/j.jamda.2012.07.008.
20. Castle NG, Anderson RA. Caregiver staffing in nursing homes and their influence on quality of care: using dynamic panel Estimation methods. Med Care. 2011;49:545–52. https://doi.org/10.1097/MLR.0b013e31820fbca9.
21. Kaplan HC, Brady PW, Dritz MC, Hooper DK, Linam WM, Froehle CM, et al. The influence of context on quality improvement success in health care: a systematic review of the literature. Milbank Q. 2010;88:500–59. https://doi.org/10.1111/j.1468-0009.2010.00611.x.
22. Vogelsmeier A, Scott-Cawiezell J. Achieving quality improvement in the nursing home: influence of nursing leadership on communication and teamwork. J Nurs Care Qual. 2011;26:236–42. https://doi.org/10.1097/NCQ.0b013e31820e15c0.

23. Vaughn VM, Saint S, Krein SL, Forman JH, Meddings J, Ameling J, Winter S, Townsend W, Chopra V. Characteristics of healthcare organisations struggling to improve quality: results from a systematic review of qualitative studies. BMJ Qual Saf. 2019;28:74–84. https://doi.org/10.1136/bmjqs-2017-007573.
24. Johannessen T, Ree E, Aase I, et al. Exploring challenges in quality and safety work in nursing homes and home care– a case study as basis for theory development. BMC Health Serv Res. 2020;20:277. https://doi.org/10.1186/s12913-020-05149-x.
25. National Health Care Institute. Quality framework for nursing home care: learning and improving together (in Dutch). Diemen. 2017, updated Aug 2021. https://www.zorginzicht.nl/binaries/content/assets/zorginzicht/kwaliteitsinstrumenten/kwaliteitskader-verpleeghuiszorg---2021.pdf. Accessed 9 Sept 2024.
26. Horton TJ, Illingworth JH, Warburton WHP. Overcoming challenges in codifying and replicating complex health care interventions. Health Aff (Millwood). 2018;37:191–7. https://doi.org/10.1377/hlthaff.2017.1161.
27. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M, Medical Research Council Guidance. Developing and evaluating complex interventions: the new medical research Council guidance. BMJ. 2008;29337:a1655. https://doi.org/10.1136/bmj.a1655.
28. van Staveren A, Bosboom F, Smid G, Verweij W. Doing what is necessary: evaluation In for Care! Sioo, Utrecht; 2017. https://www.eerstekamer.nl/nonav/overig/20170704/doen_wat_nodig_is/document. Accessed 24 Aug 2024.
29. Ovretveit J, Klazinga N. Learning from large-scale quality improvement through comparions. Int J Qual Health Care. 2012;24(5):463–9.
30. Strating MMH, Stoopendaal AMV, Zuiderent-Jerak T, Nieboer AP, Bal RA. Towards sustainable improvement in long-term care? Interim results of the National improvement programme care for better (in Dutch). Tijdschrift Voor Gezondheidswetenschappen. 2009;87:374–83.
31. Vermunt P, Reijmer Y, van Biessum C, de Groot V, van den Berg B, Nies H. Improving the quality of care in nursing home organizations with urgent quality issues: design and effectiveness of a Dutch government-funded support programme. BMC Health Serv Res. 2023;23(1):507. https://doi.org/10.1186/s12913-023-09538-w.
32. Triemstra M, Menting J, van den Berg B. Quality evaluation questionnaires - nursing homes (QEQ-NH); validation of questionnaires for measuring quality of care in nursing homes from various perspectives. BMC Health Serv Res. 2021;21(1):961. https://doi.org/10.1186/s12913-021-06823-4.
33. Bartholomew Eldredge LK, Markham CM, Ruiter RAC, Fernández ME, Kok G, Parcel GS. Planning health promotion programs: an intervention mapping approach. 4th ed. San Francisco: Jossey-Bass; 2011.
34. Naber J, Reijmer Y, van den Berg B. Kwaliteitsverbetering Als Een Gezamenlijke Opgave: evaluatie Van Een kwaliteitsinstrument in de verpleeghuiszorg [Quality improvement as a joint task]. TSG. 2023;101:58–62. https://doi.org/10.1007/s12508-023-00390-1. Dutch.
35. Sullivan GM, Artino AR Jr. Analyzing and interpreting data from Likert-type scales. J Grad Med Educ. 2013;5:541–2. https://doi.org/10.4300/JGME-5-4-18.
36. Hox JJ, Moerbeek M, van de Schoot R. Multilevel analysis: techniques and applications. 3rd ed. Routledge:Taylor & Francis Group; 2017.
37. Benjamini Y, Hochberg Y. Controlling the false discovery rate: A practical and powerful approach to multiple testing. J Royal Stat Society: Ser B (Methodological). 1995;57(1):289–300. https://doi.org/10.1111/j.2517-6161.1995.tb02031.x.
38. Chadborn NH, Devi R, Hinslif-Smith K, BanderJee J, Gordon AL. Quality improvement in long-term care settings: a scoping review of effective strategies used in care homes. Eur Ger Med. 2021;12:17–26.
39. Carpenter D, Hassell S, Mardon R, Fair S, Johnson M, Siegel S, Nix M. Using learning communities to support adoption of health care innovations. Jt Comm J Qual Patient Saf. 2018;44(10):566–73. https://doi.org/10.1016/j.jcjq.2018.03.010.
40. Olson JR, Walker ER, Chwastiak L, Druss BG, Molfenter T, Benson F, Cerrato A, Gotham HJ. Supporting implementation through online learning communities: lessons learned from a National training and technical assistance network. Eval Health Prof. 2024;47(2):178–91. https://doi.org/10.1177/01632787241237246.
41. Scott-Cawiezell J, Jones K, Moore L, Vojir C. Nursing home culture: a critical component in sustained improvement. J Nurs Care Qual. 2005;20:341–8. https://doi.org/10.1097/00001786-200510000-00010.
42. Rondeau KV, Wagar TH. Organizational learning and continuous quality improvement: examining the impact on nursing home performance. Healthc Manage Forum. 2002;15:17–23. https://doi.org/10.1016/S0840-4704(10)60576-5.
43. Verbeek FHO, van Lierop MEA, Meijers JMM, van Rossum E, Zwakhalen SMG, Laurant MGH, van Vught AJAH. Facilitators for developing an interprofessional learning culture in nursing homes: a scoping review. BMC Health Serv Res. 2023;23:178. https://doi.org/10.1186/s12913-023-09092-5.
44. Anvik C, Solstad Vedeler J, Wegener C, Slettebo A, Odegard A. Practice-based learning and innovation in nursing homes. J Workplace Learn. 2019;32:122–34.
45. Ellström PE. Practice-based innovation: a learning perspective. J Workplace Learn. 2010;22:27–40.
46. Puhakka IJA, Nokelainen P, Pylväs L. Learning or leaving?? Individual and environmental factors related to job satisfaction and turnover intention. Vocations Learn. 2021;14:481–510. https://doi.org/10.1007/s12186-021-09275-3.
47. Rose RC, Kumar N, Pak OG. The effect of organizational learning on organizational commitment, job satisfaction and work performance. J Appl Bus Res. 2009;25:55–66.
48. Shelton RC, Rhoades Cooper B, Wiltsey SS. The sustainability of evidence based interventions and practices in public health and health care. Annu Rev Public Health. 2018;1(39):55–76.
49. May CR, Johnson M, Finch T. Implementation, context and complexity. Implement Sci. 2016;11:141. https://doi.org/10.1186/s13012-016-0506-3.
50. Central Committee on Research Involving Human Subjects (CCMO). Your research: Is it subject to the WMO or not? CCMO: the Hague, the Netherlands. https://english.ccmo.nl/investigators/legal-framework-for-medical-scientific-research/your-research-is-it-subject-to-the-wmo-or-not. Accessed 1 Apr 2025.
51. Central Committee on Research Involving Human Subjects (CCMO). https://english.ccmo.nl/. Accessed 1 Apr 2025.
52. Behavioural research and the WMO. CCMO; CCMO: the Hague, the Netherlands. 2002. https://english.ccmo.nl/publications/publications/2002/01/01/ccmo-memorandum-behavioural-research.

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