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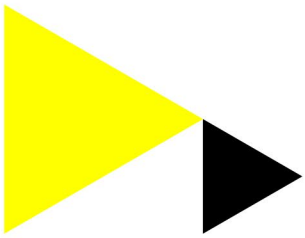
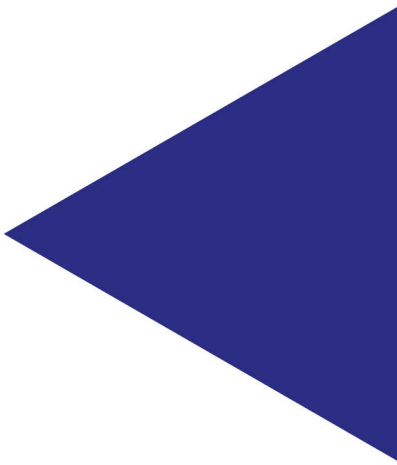
A quasi-experimental study





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ORIGINAL RESEARCH: EMPIRICAL RESEARCH – MIXED METHODS

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The implementation of a professional practice model to improve the nurse work environment in a Dutch hospital: A quasi-experimental study

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Abstract

Aims: To evaluate the effects of the implementation of a professional practice model based on Magnet principles on the nurse work environment in a Dutch teaching hospital.

Design: A quasi-experimental study.

Methods: Data were collected from registered nurses working on the clinical wards and outpatient clinics of the hospital in June/July 2016 (baseline) and in June/September 2019 (measurement of effects). Participants completed the Dutch Essentials of Magnetism II survey, which was used to measure their perception of their work environment. After baseline measurements were collected, interventions based on a professional practice model incorporating Magnet principles were implemented to improve the nurse work environment. Descriptive statistics and independent t-tests were conducted to examine differences between survey outcomes in 2016 and 2019.

Results: Survey outcomes revealed significant changes in the nurse work environment between 2016 and 2019. Seven of the eight subscales (essentials of magnetism) improved significantly. Score for overall job satisfaction increased from 7.3 to 8.0 and score for quality of care increased from 7.0 to 7.6. On unit level, 17 of the 19 units showed improvement in the nurse work environment.

Conclusion: The implementation of a professional practice model positively affects the nurse work environment, job satisfaction and quality of care.

Impact: Nowadays, the quality of care is threatened by workload pressure and the low autonomy experienced by nurses. Considering the global shortage of nurses and growing complexity of healthcare, it is important to invest in improving the nurse work environment. The Magnet concept created a work environment in which nurses can deliver optimal quality of care. Knowledge of how Magnet principles affect the nurse work environment in the Netherlands is missing. These study results, including the description of how the interventions were implemented, will assist other hospitals to develop improvement strategies by focusing on the nurse work environment.

KEYWORDS
essentials of magnetism, hospital nurses, Magnet, nurse work environment, nurses, nursing, organizational improvement, practice environment, shared governance, work environment

1 | INTRODUCTION

Nurses interact with patients on a daily basis, making them important for high-quality care and positive patient outcomes (Antoinette Bargagliotti, 2012; Cummings, 2013; McHugh et al., 2013). The quality of care and patient outcomes are threatened by the workload pressure and physical and emotional demands placed on nurses. On top of that, nurses have little leeway to arrange their work, and a low degree of autonomy (Amini et al., 2015; Bahadori & Fitzpatrick, 2009; Hoeve et al., 2014; Labrague et al., 2019; Maharmeh, 2017). Keyko (Keyko et al., 2016) stated that high autonomy correlates positively with work engagement, thereby improving patient outcomes. Considering the global shortage of nurses, pressure on the accessibility and continuity of healthcare, and the growing complexity of healthcare (Health at a Glance: Europe, 2018; World Health Organization, 2020), it is now critical to invest in qualified and educated nurses and to create work environments that support high-quality nursing care.

The 2004 report published by the Institute of Medicine (IOM, 2004) on patient safety was the first to recognize the connection between nursing, quality of care, and patient safety. To improve quality of care and patient safety, professional organizations such as the IOM and the American Nurses Association (ANA) have placed great emphasis on improving the nurse work environment. In the 1990s, the ANA established the Magnet Recognition Program® to foster a better nurse work environment. This programme is based on the findings of one of the first studies about nurse work environment, conducted by McClure (McClure, 1983). This study identified hospitals that were successful in attracting and retaining nurses and determined the organizational features those hospitals had in common, such as high nurse autonomy, decentralized organizational structure, and supportive management. Over the past decades, a series of studies have been conducted to identify hospitals that provide excellent nursing and patient care. These 'best quality' hospitals were the first Magnet® organizations (Schmalenberg & Kramer, 2008).

2 | BACKGROUND

A growing body of research indicates that Magnet organizations – with their focus on a healthy work environment – experience higher nurse job satisfaction, lower nurse turnover (Hickson, 2013; Kelly et al., 2011; Lacey et al., 2007; Park et al., 2016; Staggs & Dunton, 2012; Ulrich et al., 2007), better quality of care and safety for patients (Chen et al., 2014; Djukic et al., 2013; Jayawardhana et al., 2011; Kalisch & Lee, 2012; Lasater et al., 2016; McHugh & Stimpfel, 2012; Melnyk et al., 2012; Smith, 2014; Stimpfel et al., 2014, 2016), and better patient outcomes (Barnes et al., 2016; Bekelis et al., 2017; Bergquist-Beringer et al., 2013; Djukic et al., 2013; Evans et al., 2014; Friese et al., 2015; Lake et al., 2010, 2012; McHugh et al., 2013). Magnet hospitals are mainly established in the United States of America (USA), but Magnet has recognized 13 hospitals in Europe, Canada, Australia and the Middle East, which shows the applicability outside the USA. Magnet recognizes healthcare organizations for high-quality patient care, nursing excellence and innovations in professional practice. The Magnet® program is the gold standard of nursing excellence, it aims to guide the creation of a healthy work environment. A healthy nurse work environment can be defined as 'one in which leaders provide the structures, practices, systems and policies that enable clinical nurses to engage in the work processes and relationships essential to safe and quality patient care outcomes' (Schmalenberg & Kramer, 2008). A healthy nurse work environment is a workplace that is safe, empowering, and satisfying (American Nurses Association, 2020) and promotes work engagement (Keyko et al., 2016).

Hospitals that are prepared to create a Magnet culture have to invest in transformational leadership, structural empowerment, exemplary professional practice, new knowledge, innovations and improvements, and empirical outcomes (American Nurses Association, 2019). These concepts can be considered as the Magnet principles. In the Netherlands, there is a growing interest in the Magnet principles. Kramer and Schmalenberg (Schmalenberg & Kramer, 2008) studied Magnet Hospitals and identified eight care processes and relationships that are essential for a healthy nurse work environment: the essentials of magnetism (EOM). Based on this EOM, the Dutch Nurses' Association (V&VN) developed the Excellent Care (Excellente Zorg) Program in 2009, which was tailored to the Dutch healthcare system. The aim of this programme was the same as that of Magnet: to attract, captivate, and retain well-qualified nurses and to improve the quality of patient care, based on the Magnet principles and Dutch research (de Brouwer et al., 2014).

The Excellent Care Program has three pillars (see Figure 1):

Every Dutch healthcare organization can engage in the Excellent Care Program. The programme involves collecting baseline measurements of the three pillars and then collecting the same measurements every 3 years to monitor the effect of interventions. Participating organizations develop their own interventions based on research outcomes. V&VN supports the development of interventions and promotes learning between participating organizations through conferences, meetings and interaction between organizations. Participating in the Excellent Care Program contributes to a healthy nurse work environment, increases nurses' professional expertise, improves the position of the nursing profession and provides insight into strengths and areas for improvement in an organization.

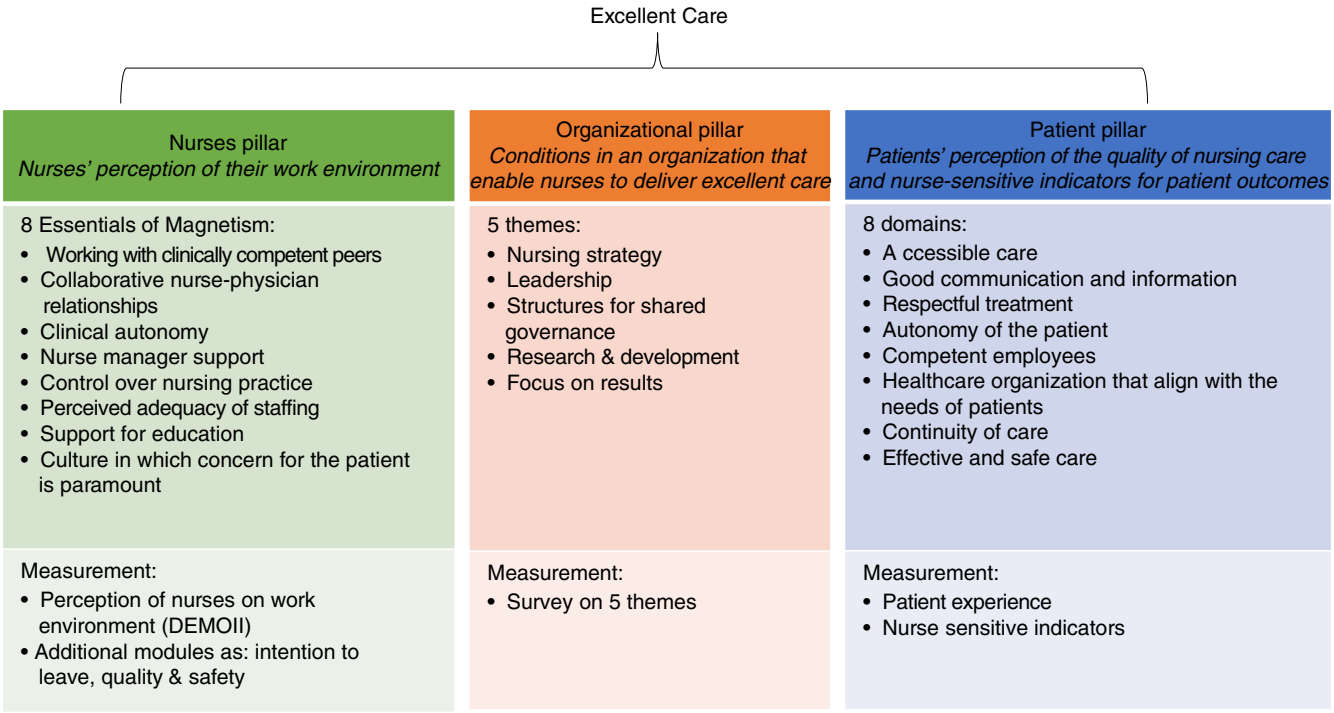

FIGURE 1 Three pillars of the Excellent Care Program

Our Dutch teaching hospital, Tergooi, started the Excellent Care Program in 2016 by collecting baseline measurements of the three pillars (Figure 1). Through this programme, we wanted to achieve:

- Magnet level scores in 75% of variables (essentials of magnetism, job satisfaction and quality of patient care).
- A score of 8 out of 10 on overall job satisfaction.
- A score of 8 out of 10 on quality of patient care.
- Improvement of the nurse work environment by all teams.

Based on our baseline data, we developed a professional practice model (PPM) similar to many Magnet hospitals (Hoffart & Woods, 1996). A PPM provides the overall philosophy of how nursing in a healthcare organization can achieve positive patient and staff outcomes. It serves as a framework for guiding and aligning clinical practice, education, administration and research (Slatyer et al., 2016).

Our PPM is based on the Magnet principles and the organization pillar of the Excellent Care Program and was adapted to our local hospital situation (see Figure 2). The PPM was leading for the interventions, conducted in the Excellent Care Program.

3 | THE STUDY

3.1 | Aim

The aim of this study was to evaluate the implementation of a PPM based on Magnet principles on the nurse work environment in our hospital.

3.2 | Design

This was a quasi-experimental (one group, pre- and post-test design) study.

3.3 | Setting

The study was conducted between 2016 and 2019 in a Dutch teaching hospital with 370 beds and 2,600 employees including 750 nurses.

3.4 | Local context

Tergooi hospital is governed by a board of directors with a background in business administration or medicine, together with an executive committee of medical staff.

In 2016, no one (such as a chief nursing officer) was fully accountable for helping nurses achieve consistent quality patient outcomes in our hospital. Directors and managers are together responsible for developing the nursing profession. After major events, including a merger, financial crisis, structural reorganization of the profit centre, and a new long-term strategic plan, the hospital started working on a new hospital building. However, nurses did not participate in the hospitals' strategy. Instead of taking responsibility in the organization for their own work and work environment, they simply directed higher-status stakeholders. Because nurses are essential for good clinical performance, we have searched for ways to empower

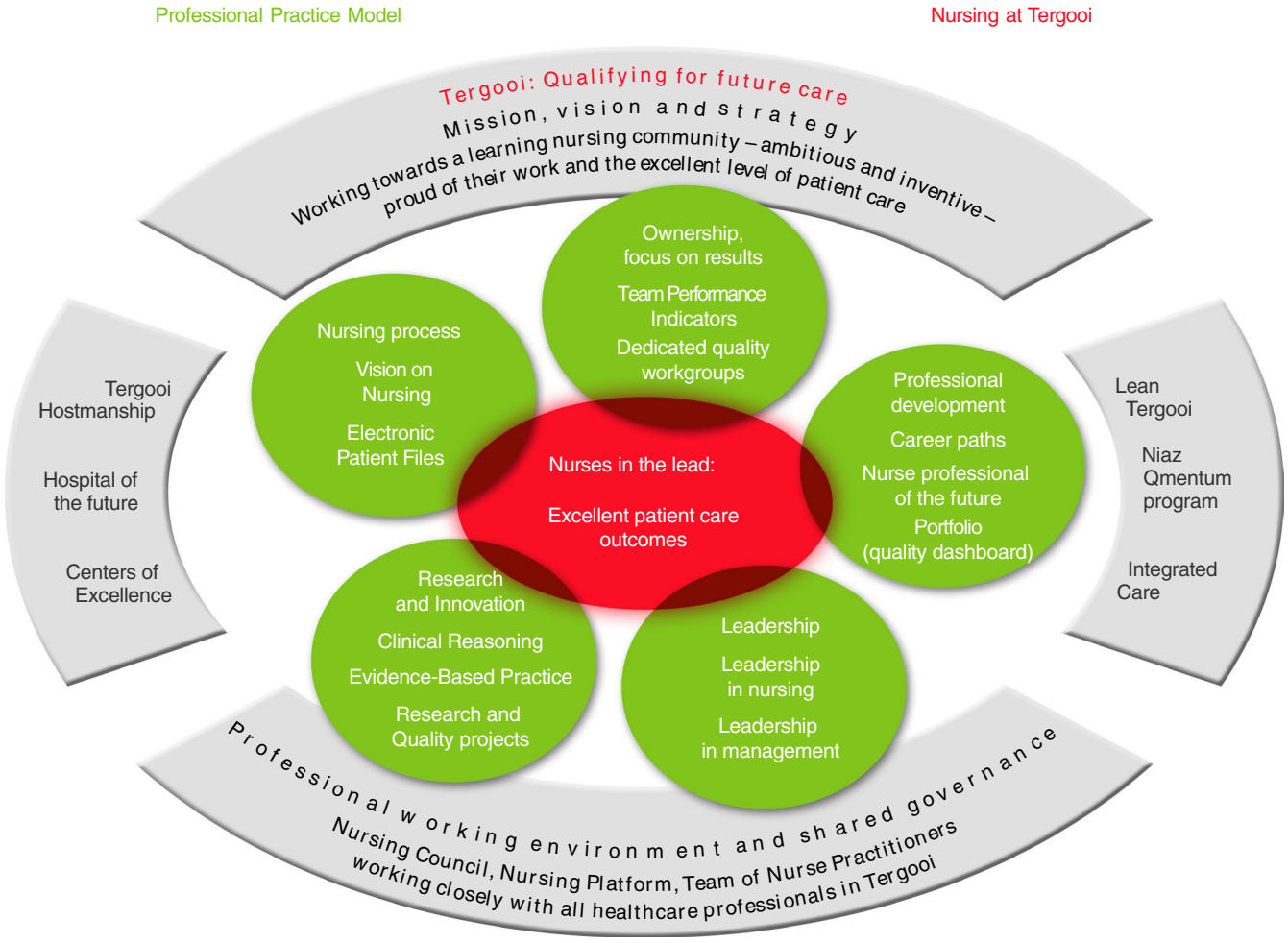

FIGURE 2 Professional practice model at Tergooi hospital

the nursing profession. Our hypothesis was that the Excellent Care Program of V&VN could support this mission.

3.5 | The project team

Our initial approach was project-based, with a project team and a steering committee. The project team consisted of a programme manager (a nurse with a PhD and vast experience in developing the nursing profession), four nurses, a nurse manager, and an administrative assistant. The steering committee consisted of the programme manager, two nurses, a secretary, an executive director, and a human resources manager. After one year, this project-based structure was dissolved, and the Excellent Care Program was led by a programme manager and two other nurses who formed a 'vital coalition'. From now on, 'we' refers to this vital coalition.

The nursing council supported the programme manager in implementing interventions to improve the nurse work environment. Many hospital staff were involved in these interventions, including human resources staff, teachers, board of directors, managers and nurses.

3.6 | Study of the interventions

Surveys were conducted by V&VN in June/July 2016 (baseline) and June/September (measurement of effects) 2019. After baseline measurements were collected, interventions to improve the nurse work environment were implemented.

3.7 | Sample/participants

All registered nurses working on a clinical ward or outpatient clinic were asked to complete the survey at baseline and again three years later. Exclusion criteria were: (i) employed less than 3 months and (ii) still in training to be a nurse. Lists of nurses were provided by the human resources department and shared with V&VN. V&VN sent the survey to the nurses and collected and analysed the data. The hospital received a report describing the survey results on the three pillars of the Excellent Care Program.

3.8 | Interventions

Below, we outline the interventions of our PPM and describe some concrete examples. Figure 2 shows five green circles and a grey bar. This grey bar represents a supportive professional work environment and shared governance structure, which are needed for nurses to provide excellent care. The concepts in the green circles show the specific interventions.

3.8.1 | The base: Professional working environment and shared governance

We started by implementing a shared governance (Porter-O'Grady, 2009) structure for nurses to allow professional nursing practice to flourish. In 2016, the hospital had a nursing council, which had little control over nursing practice and a well-functioning nursing platform (community of practice). As part of our interventions, the nursing council was renewed and new general regulations and a mandate were made. In addition, the nursing council became more connected to the nursing platform. Advanced nurse practitioners established a professional group and wrote a policy plan to strengthen their profession and position. One advanced nurse practitioner became a member of the nursing council to liaise between both groups. In the organization, we created awareness of the importance of a professional working environment both at the operational and strategical level. In the workplace, we spread the philosophy of the Magnet principles. We taught nurses how important a healthy nurse work environment is to job satisfaction and quality of care. At the level of board and management, we advocated the importance of a professional working environment.

International exchange and inspiration became an important part of the 'journey to excellence'. In 2016, 2017, and 2019, our nurses and managers went to the United States to visit Magnet hospitals and to attend the ANCC Magnet conference. In 2018, nine nurses from the United States visited the hospital to share valuable knowledge and input.

In summary, we worked on knowledge of magnet principles and empowerment of, and interconnectedness between nurses.

3.8.2 | Component 1: Nursing process

The Nursing Standard, a guide for the performance and development of the nursing profession, was developed in 2015. In 2018, the Nursing Standard was updated and distributed in a summary folder to all nurses to help them embrace the vision.

We developed a Nursing Strategic Multiannual Plan for 2018–2021, with input from around 80 nurses. This plan was aligned with the strategic plan of the organization and the PPM. Concrete activities per year were described in the annual plan. For example, the topic of family participation in the multiannual plan was included as extension of visiting hours in the annual plan.

Integrating the nursing process with the electronic health record (EHR) is still challenging. The new EHR was introduced in December 2016. To include our vision on nursing in the new EHR, we employed a nurse to translate nursing into Information and communications technology (ICT) and vice versa across the organization. This role is a precursor to a chief nursing information officer position. On every nursing ward, we employed a nurse to be the key-user for the EHR.

In summary, we worked on vision, reflection, and alignment.

3.8.3 | Component 2: Professional development

We developed multiple career paths for nurses, including a position for an academically trained nurse that combines patient care with research and quality improvement, which is not yet common in the Netherlands. We also developed a job profile, responsibilities, and corresponding salary for Bachelor-trained nurses.

We also collaborated with colleagues in the departments of human resources and recruitment and in the Training and Education Centre and nursing council on nursing topics. We met every 6 weeks to discuss items such as recruitment, branding, onboarding, professional advancement, exit management and professional competence. This resulted in a strong collaboration that helped to improve the nurse work environment.

In summary, we worked on career perspectives and collaboration.

3.8.4 | Component 3: Leadership

We developed a vision for nursing leadership in addition to the Nursing Standard guidelines. In this vision, we distinguished between (1) clinical leadership, (2) professional leadership, (3) organization, system, and leadership and (4) policy, politics, and leadership to emphasize that leadership are relevant on multiple levels in the hospital organization. The project team and nursing council show an exemplary role in leadership, at both the hospital and national level. We recruited Magnet ambassadors on every ward – these were nurse leaders designated to help disseminate the Magnet philosophy. We encouraged nurses to show leadership and placed them in the right positions to do so.

A new nursing leadership course is on offer in the Netherlands, and we allowed our nurses to participate in this course every year. We developed an innovative regional version of the new nursing leadership course, in which nurses working in hospitals, nursing homes or homecare could participate every 18 months.

We started to use social media (e.g. Facebook, Instagram, corporate intranet) to inform others about the nurses' work in the hospital, to connect nurses with other colleagues, and to stimulate pride in the nursing profession.

In summary, we worked on education, encouragement, role development, and pride.

3.8.5 | Component 4: Research and innovation

We helped nurses to develop skills in clinical reasoning and evidence-based practice. In the 'clinical reasoning' learning path, a nurse learns to substantiate their observations and to anticipate acute care provision in six steps. In the 'evidence-based practice' learning path, nurses learn to find evidence-based answers to problems or questions related to their clinical practice. We also worked on an infrastructure for nursing research. We started to centralize the research topics for nursing students and arranged supervision for nursing students by nurses with a MSc or PhD degree to improve research quality and relevance. We collaborated with a professor in nursing science, who helped nurses working in the hospital to obtain a PhD.

In summary, we worked on professional competence, education, connection, science, and practice.

3.8.6 | Component 5: Ownership and focus on results

We started to make nurses more aware that their actions determine patient outcomes by teaching them about nurse-sensitive indicators. Teams were challenged to discuss how team performance relates to patient problems and to create their own quality indicators and steering actions. Step-by-step, we are working towards optimal utilization of patient outcome data that reflects team performance.

In summary, we worked on quality awareness, data use, and team performance.

3.9 | Data collection

3.9.1 | Demographics

Nurse characteristics included nurses' age, sex, years of experience, and educational level of nursing.

3.9.2 | Nursing work environment

This study used the Dutch Essentials of Magnetism (D-EOMII) survey. The D-EOMII is a Dutch version of the Essentials of Magnetism II (EOMII) survey (Kramer & Schmalenberg, 2004). This instrument allows researchers to compare findings with those of other Dutch hospitals (de Brouwer et al., 2014). The D-EOMII is a process-measurement instrument that assesses the health of the unit work environment. The D-EOMII contains eight subscales (working with clinically competent peers, collaborative nurse–physician relationships, clinical autonomy, nurse manager support, control over nursing practice, perceived adequacy of staffing, support for education and culture in which attention for the patient is paramount) with a total of 58 items that are scored using a four-point Likert scale, ranging from 1 (strongly disagree) to 4 (strongly agree). The scores on the Likert scale are recalculated into dichotomous variables, according to a formula of Kramer & Schmalenberg to create outcomes that allow comparison with the National Magnet Hospital Profile (NMHP; Schmalenberg & Kramer, 2008).

Analysis of variance with post hoc multiple comparisons using Tukey statistical procedures on unit aggregated data identified the statistically significant homogeneous subsets. The highest subset was the NMHP profile, the middle subset was the Magnet aspiring profile, and the lowest subset was the non-Magnet profile. National Magnet hospital profiles are updated periodically (Schmalenberg & Kramer, 2008).

The last questions in the survey are a judgement on overall job satisfaction and quality of patient care. The total score on the eight subscales is the professional job satisfaction.

The benchmark for most questions is based on the RN4CAST study in which 2,217 Dutch nurses from 26 hospitals participated (Aiken et al., 2013; Ausserhofer et al., 2014). For questions lacking this data set, a benchmark is used based on a data set including more than 10,000 Dutch nurse participants.

Nurses received the questionnaires by email accompanied by an information letter. Respondents were assured of the confidentiality of their responses. Reminders were sent by email and a weekly visit to the wards to report the response rate and to encourage nurses to complete the survey (by giving incentives such as chocolate and cake).

3.9.3 | Ethical considerations

In line with Dutch law (CCMO, n.d.), no approval of an ethics committee was applicable as this study included staff and because no medical or patient data were collected, and individuals were not subjected to invasive or demanding regimes. All participants were informed verbally and via an instruction letter. Informed consent was given by filling out the survey. Answers were anonymous. This paper is written in accordance with the Standards for Quality Improvement Reporting Excellence guidelines, v.2.0. The TIDieR checklist was used to ensure that sufficient information about the intervention is reported (Hoffmann et al., 2014).

3.9.4 | Data analysis

Data were analysed in the Statistical Package for the Social Sciences v. 26 (IBM Corp., 2019). Descriptive statistics were computed to describe socio-demographic and clinical characteristics of study participants. Independent samples t-tests and Chi-square tests were conducted to identify differences in socio-demographic and clinical characteristics between survey outcomes in 2016 and 2019.

Independent samples t-tests were conducted and a 95% confidence interval was calculated to compare hospital subscale scores from the 2016 and 2019 surveys.

3.9.5 | Validity, reliability and rigour

In this study, we used the Dutch version of the Essentials of Magnetism II (E-OMII) survey (Kramer & Schmalenberg, 2004). The Dutch-translated EOMII (D-EOMII) previously demonstrated acceptable reliability and validity for assessing hospital staff nurses' work environment. Face validity was confirmed. Cronbach's α for the entire scale was 0.92 and ranged from 0.58 to 0.92 for eight subscales (de Brouwer et al., 2014).

The data of the D-EOMII were first analysed by V&VN (as part of the Excellent Care Program) and then repeated by us. No differences were found in statistical outcomes.

4 | RESULTS

4.1 | Demographics

The D-EMOII survey was sent to all registered nurses working in clinical wards or outpatient clinics. In 2016, 490 nurses (64.2%) responded and in 2019, 309 nurses (43.0%) responded. Thirty hospital units were involved.

There were no significant differences in demographics between the nurse respondents in both surveys (Table 1). Table 1 summarizes the demographic variables of the 2016 and 2019 survey respondents.

TABLE 1 Demographic characteristics of nurses surveyed in 2016 and 2019

	Pre-test ($n = 490$)	Post-test ($n = 309$[a])	*p*-value
Age in years (mean, SD)	43.29 (11.98)	43.29 (12.52)	0.997[c]
Work experience in the hospital (mean, SD)	14.14 (10.67)	14.67 (12.20)	0.527[c]
Sex (*n*, %)			0.136[d]
Female	432 (88.2)	280 (91.5)	
Male	58 (11.8)	26 (8.5)	
Education level (*n*, %; as indicated by respondents)			0.795[c]
Associate degree (NLQF 4)	293 (59.8)	165 (53.4)	
Bachelor degree (NLQF 6)	116 (23.7)	105 (34.0)	
Advanced nurse practitioner	19 (3.9)	11 (3.6)	
Other[b]	62 (12.7)	27 (8.7)	

[a]*N* varies from 306 to 309 because of missing values

[b]Older initial nursing education, not qualified as associate or bachelor degree.

[c]Independent samples *t*-test.

[d]Chi-squared test.

4.2 | Overall results of the essentials of magnetism

Significant changes took place in the nurse work environment between 2016 and 2019 as noted in Table 2. In 2016, the hospital scored Magnet on the variables 'adequacy of staffing' and 'overall job satisfaction'. In 2019, the hospital scored Magnet on the variables 'nurse–physician relationship', 'clinical autonomy', 'control over nursing practice', 'overall job satisfaction' and 'professional job satisfaction'. The hospital improved significantly in all variables, except for 'adequacy of staffing'. Results for individual variables are described below.

4.3 | Results of each essential of magnetism

4.3.1 | Essentials of magnetism: Working with clinically competent peers

Nurses' perception of working with clinically competent colleagues improved significantly in 2019 compared with in 2016. Nurses stated, both in 2016 and 2019, that recurrent training improves clinical competence and that a completed training is proof of clinical competence. The scores on these statements were high. However, in 2019, nurses still indicated that they do not feel rewarded for their high clinical competence (Table 3). The total score on this variable was Magnet aspiring (Table 2).

4.3.2 | Essential of magnetism: Collaborative nurse–physician relationships

in this variable, nurses described their relationship with physicians. The 'negative' and 'friendly stranger' relationship score was low, while the student–teacher relationship scored above Magnet level but was not yet considered a collegial relationship in which physicians and nurses are equal. In 2019, scores for all statements were higher than those achieved in 2016, and nurse–physician relationships were considered collegial, meaning that both nurses and physicians have equal but different influence (Table 4). Therefore, the score on this variable was Magnet (Table 2).

4.3.3 | Essential of magnetism: Clinical autonomy

In the 2016 survey, nurses stated that they were able to make their own decisions and that they felt supported by their manager and organization to do so. In 2019, higher scores for this variable indicated that this feeling had become stronger (Table 5). In 2016, nurses believed that autonomy was risky, but this belief had decreased in 2019.

TABLE 2 Results of the D-EOMII

	2016		2019		Difference between 2016 and 2019 *p*-value[b] [95% CI]	Magnet (NMPH)	Benchmark other Dutch hospitals
Process variables							
Clinically competent peers	11.1	A[a]	11.3	A	0.113 [−0.39, 0.41]	12.0	11.1
Nurse–physician relationships	42.1	A	45.1	M[a]	≤0.001 [−3.95, −2.20]	45.2	45.1
Clinical autonomy	74.1	A	78.0	M	≤0.001 [−5.30, −2.56]	76.4	75.9
Nurse manager support	32.9	A	35.7	A	≤0.001 [−3.51, −2.03]	36.8	34.0
Control over nursing practice	67.4	A	71.8	M	≤0.001 [−5.81, −2.97]	70.6	68.7
Support for education	10.6	A	11.3	A	≤0.001 [−0.85, −0.39]	11.8	10.8
Adequacy of staffing	15.1	M	15.7	A	≤0.001 [−1.00, −0.29]	16.2	15.4
Patient-centred culture	29.6	A	30.8	A	≤0.001 [−1.80, −0.81]	31.8	29.5
Result variables							
Overall job satisfaction	7.3	M	8.0	M	≤0.001 [−1.10, −0.67]	6.9	7.4
Quality of patient care	7.0	A	7.6	A	≤0.001 [−0.90, −0.51]	8	7.5
Professional job satisfaction	278.3	A	299.7	M	≤0.001 [−25.83, −17.01]	300.7	290.0

[a]'M' is Magnet level, 'A' is Magnet aspiring.

[b]Independent samples *t*-test.

TABLE 3 Results on individual statements of the variable 'Clinically competent peers'

	2016 (*n* = 490)	2019 (*n* = 306)	
	Mean[a] (SD)	Mean[a] (SD)	Magnet (NMHP)
Work with other nurses who are clinically competent	90.7 (29.1)	92.2 (26.9)	94.4
High clinical competence is rewarded	26.8 (44.3)	33.0 (47.1)	64.4
Degree education is evidence of competence	91.7 (27.6)	92.8 (25.9)	80.9
Certification is evidence of competence	83.2 (37.4)	81.1 (39.3)	83.0
Total (weighted response)	11.1 (1.5)	11.3 (1.6)	12

[a]Mean score of all the respondents on the Likert scale recalculated to create outcomes that allow comparison with the National Magnet Hospital Profile (NMHP; Schmalenberg & Kramer, 2008).

Nurses felt more supported by their manager in taking autonomy. However, improvements could still be made because nurses still indicated a pressure to do things against their better judgement. The total score on this variable reached Magnet level in 2019 (see Table 2).

4.3.4 | Essential of magnetism: Nurse manager support

The 2016 survey revealed that nurses were not sufficiently supported by the nurse manager in representing their unit, providing needed resources, supporting competent staff, and facilitating teamwork. Support from nurse managers significantly improved according to the 2019 survey. Nurses felt much more supported and believed that their manager represented their unit, resolved nurse–physician conflicts, supported competent staff and provided constructive feedback (Table 6). The total score in this variable was Magnet aspiring (Table 2).

4.3.5 | Essential of magnetism: Control over nursing practice

In 2016, nurses were vaguely aware of 'control over nursing practice', such as through a shared governance structure. However, they could not describe outcomes of shared decision-making and did not feel they had control over personnel policies. In 2019, some aspects of 'control over nursing practice' improved, including familiarity with shared governance structure, and the opportunity to give input into practice issues/policies. The interdisciplinary nature of the shared

TABLE 4 Results on individual statements of the variable 'Nurse–physician relationships'

	2016 ($n = 490$)	2019 ($n = 306$)	
	Mean[a] (SD)	Mean[a] (SD)	Magnet (NMHP)
Student–teacher: physicians teach nurses	92.0 (27.2)	96.7 (17.8)	78.1
Collaborative: willing cooperation based on mutual power	71.5 (45.2)	84.6 (36.1)	85.2
Negative: frustrating and hostile[b]	7.3 (26.0)	4.6 (20.9)	16.8
Student–teacher: nurses teach/ influence physicians	78.6 (41.1)	83.7 (37.0)	66.7
Friendly stranger: formal, courteous, information exchange only[b]	22.2 (41.6)	16.0 (36.4)	58.7
Collegial: physicians treat nurses as equal	64.3 (48.0)	79.4 (40.5)	80.6
Total (weighted response)	42.1 (6.1)	45.1 (6.4)	45.2

[a]Mean score of all the respondents on the Likert scale recalculated to create outcomes that allow comparison with the National Magnet Hospital Profile (NMHP; Schmalenberg & Kramer, 2008).
[b]Statement is formulated negatively; lower scores indicate a more positive outcome.

TABLE 5 Results on individual statements of the variable 'Clinical autonomy'

	2016 ($n = 490$)	2019 ($n = 306$)	
	Mean[a] (SD)	Mean[a] (SD)	Magnet (NMHP)
Autonomy is risky – nurses fear getting into trouble[b]	32.7 (47.0)	14.7 (35.5)	32.1
Know that nurse manager wants us to make decisions	64.8 (47.8)	79.4 (40.5)	69.3
Must get permission before making independent or interdependent decisions[b]	45.2 (49.8)	40.2 (49.1)	62.3
Practice spheres decision-making	79.4 (40.5)	87.6 (33.0)	75.6
Evidence-based practice provides knowledge base	84.8 (35.9)	87.3 (33.4)	82.6
Bureaucratic rules inhibit[b]	32.6 (46.9)	26.1 (44.0)	40.7
Must do things against better judgement[b]	33.8 (47.3)	29.7 (45.8)	21.0
Positive accountability	49.4 (50.0)	63.1 (48.3)	78.2
Administration sanctions staff nurse clinical autonomy	52.7 (50.0)	61.1 (48.8)	63.2
Total (weighted response)	74.1 (10.0)	78.0 (9.1)	76.4

[a]Mean score of all the respondents on the Likert scale recalculated to create outcomes that allow comparison with the National Magnet Hospital Profile (NMHP; Schmalenberg & Kramer, 2008).
[b]Statement is formulated negatively; lower scores indicate a more positive outcome.

governance structure was lower in 2019 than in 2016 (Table 7). The total score on this variable was Magnet aspiring (Table 2).

4.3.6 | Essential of magnetism: Support for education

In 2016, nurses felt appreciated and supported by the organization to increase their knowledge and skills. However, there was no financial incentive for personal development. In 2019, the scores were higher, but still not Magnet level (Table 8). The total score in this variable was Magnet aspiring (Table 2).

4.3.7 | Essential of magnetism: Perceived adequacy of staffing

In the 2016 survey, nurses stated that normal operating staffing were adequate for providing safe care, but not always adequate for high-quality care. They indicated that improvements could be

TABLE 6 Results on individual statements of the variable 'Nurse manager support'

	2016 ($n = 490$)	2019 ($n = 306$)	
	Mean[a] (SD)	Mean[a] (SD)	Magnet (NMHP)
Nurse manager represents unit	64.3 (48.0)	83.0 (37.6)	82.1
Nurse manager provides needed resources	70.4 (45.7)	79.1 (40.7)	82.6
Nurse manager resolves nurse–physician conflicts	78.4 (41.2)	88.9 (31.5)	83.4
Nurse manager supports interdisciplinary team	75.3 (43.2)	88.2 (32.3)	89.4
Nurse manager supports competent staff	62.1 (48.6)	77.8 (41.6)	81.5
Nurse manager provides constructive feedback	81.7 (38.7)	88.6 (31.9)	84
Nurse manager facilitates teamwork	61.0 (48.8)	76.8 (42.3)	80.9
Nurse manager is visible and approachable	73.3 (44.3)	87.9 (32.7)	84.8
Nurse manager walks the talk	80.0 (40.1)	91.2 (28.4)	84
Nurse manager asks for best practice evidence	74.6 43.6)	85.0 (35.8)	88.1
Total (weighted response)	32.9 (5.4)	35.7 (4.7)	36.8

[a]Mean score of all the respondents on the Likert scale recalculated to create outcomes that allow comparison with the National Magnet Hospital Profile (NMHP; Schmalenberg & Kramer, 2008).

TABLE 7 Results on individual statements of the variable 'Control over nursing practice'

	2016 ($n = 490$)	2019 ($n = 306$)	
	Mean[a] (SD)	Mean[a] (SD)	Magnet (NMHP)
Control over nursing practice structure in place	84.6 (36.1)	95.4 (20.9)	75.0
Input and decision-making into practice issues/policies	62.9 (48.4)	74.8 (43.5)	61.4
Recognition by physicians, administrators, and others	63.4 (48.2)	76.8 (42.3)	58.6
Structure is present but mostly 'talk'[b]	71.3 (45.3)	55.2 (49.8)	32.0
Structure is interdisciplinary	40.7 (49.2)	40.2 (49.1)	48.8
Personnel policies and issues	25.8 (43.8)	31.7 (46.6)	54.0
Can describe outcomes of shared decision-making	51.5 (50.0)	60.5 (49.0)	80.4
Management and others decide nursing issues[b]	56.5 (49.6)	34.0 (47.4)	48.7
Total (weighted response)	67.4 (10.0)	71.8 (9.8)	70.6

[a]Mean score of all the respondents on the Likert scale recalculated to create outcomes that allow comparison with the National Magnet Hospital Profile (NMHP; Schmalenberg & Kramer, 2008).
[b]Statement is formulated negatively; lower scores indicate a more positive outcome.

made in cooperation and team spirit. In the 2019 survey, the scores for safety of care and quality of care with normal operating staffing were higher. However, the score on having enough competent nurses who know the patients, the ward, and the doctors was lower (Table 9). The total score on this variable was Magnet aspiring (Table 2).

4.3.8 | Culture in which concern for the patient is paramount

In the 2016 survey, nurses stated that the hospital had insufficient focus on the patient. The organization was too cost-driven instead of value-driven and was not proactive enough to anticipate changes in healthcare.

TABLE 8 Results on individual statements of the variable 'Support for education'

	2016 ($n = 490$)	2019 ($n = 306$)	
	Mean[a] (SD)	Mean[a] (SD)	Magnet (NMHP)
Nurses' pursuing education is valued in organization	90.7 (29.0)	93.1 (25.3)	86.6
Support to attend continuing education programmes	88.5 (32.0)	93.1 (25.3)	89.3
Few rewards for pursuing education[b]	74.3 (43.7)	70.0 (45.9)	49.7
Financial assistance or time off	58.5 (49.3)	68.6 (46.5)	84
Total (weighted response)	10.6 (1.6)	11.3 (1.6)	11.8

[a]Mean score of all the respondents on the Likert scale recalculated to create outcomes that allow comparison with the National Magnet Hospital Profile (NMHP; Schmalenberg & Kramer, 2008).
[b]Statement is formulated negatively; lower scores indicate a more positive outcome.

TABLE 9 Results on individual statements of the variable 'Adequacy of staffing'

	2016 ($n = 490$)	2019 ($n = 306$)	
	Mean[a] (SD)	Mean[a] (SD)	Magnet (NMHP)
Staffing is adequate for quality care	33.5 (47.3)	46.1 (49.9)	64.5
Not enough competent nurses[b]	28.8 (45.3)	32.3 (46.9)	44.6
Must vary care delivery system because there is not enough staff[b]	41.3 (49.3)	38.9 (48.8)	48.3
Adequate for safe care	60.5 (48.9)	71.2 (45.3)	70.7
Teamwork helps in staffing adequacy	56.9 (49.6)	72.2 (44.9)	81.2
Not enough even if all positions filled[b]	37.9 (48.6)	25.1 (43.5)	22.5
Total (weighted response)	15.1 (2.6)	15.7 (2.4)	16.2

[a]Mean score of all the respondents on the Likert scale recalculated to create outcomes that allow comparison with the National Magnet Hospital Profile (NMHP; Schmalenberg & Kramer, 2008).
[b]Statement is formulated negatively; lower scores indicate a more positive outcome.

In the 2019 survey, nurses reported that hospital staff were enthusiastic about their work and that there was more interdisciplinary teamwork than in 2016. According to the nurses, the hospital was still more cost-driven than value-driven, but there was more concern for the patient compared with in 2016 (Table 10). The total score on this variable was Magnet aspiring (Table 2).

4.4 | Result variables job satisfaction and quality of patient care

The respondents were also asked to judge their overall job satisfaction and the quality of patient care (result variables). In addition, a sum score was calculated for the eight EOM and professional job satisfaction.

4.4.1 | Overall job satisfaction

Nurses indicated their job satisfaction through a visual analogue scale (1–10). In 2016, this score was Magnet level (7.3 compared with 6.9 NMHP) and was above the benchmark of other Dutch organizations. In 2019, the score increased further to 8.0, even higher than Magnet level and well above the benchmark of other Dutch organizations.

4.4.2 | Quality of patient care

Nurses indicated the quality of care on the wards through a visual analogue scale (1–10). The mean score was 7.0 in 2016 and 7.6 in 2019; both scores were significantly lower than Magnet level (NMHP = 8.0). The mean score was lower than the benchmark of other Dutch organizations in 2016 but was higher than the benchmark in 2019.

4.4.3 | Professional job satisfaction

Professional job satisfaction had a score of 278.3 in 2016, which was lower than Magnet level (NMHP = 300.8) and lower than the benchmark of other Dutch organizations. In 2019, the score increased to 299.6, which was Magnet level and above the benchmark of other Dutch organizations.

TABLE 10 Results on individual statements of the variable 'Patient-centred culture'

	2016 ($n = 490$)	2019 ($n = 306$)	
	Mean[a] (SD)	Mean[a] (SD)	Magnet (NMHP)
Try new things	84.3 (36.4)	87.6 (33.0)	96.4
Concern for patient is paramount	77.0 (42.1)	85.0 (35.8)	88.6
Organization takes swift action	31.3 (46.4)	37.9 (48.6)	60.2
People are enthusiastic	67.9 (46.7)	82.3 (38.2)	76.8
High performance and productivity are expected	92.2 (26.8)	94.1 (23.6)	97.0
Inter- and intra-disciplinary teamwork	76.6 (42.4)	83.7 (37.0)	81.1
Cost is important, but the patient comes first	50.7 (50.1)	57.8 (49.5)	73.5
Contributions of all are valued	75.5 (43.0)	82.0 (38.5)	90.0
Proactive, anticipating changes	51.7 (50.0)	70.9 (45.5)	88.8
Organization is value-driven; values are known and shared	62.5 (48.5)	68.0 (46.7)	84.5
Transmits cultural values	67.8 (46.8)	79.1 (40.7)	85.9
Total (weighted response)	29.6 (3.5)	30.8 (3.4)	31.8

[a]Mean score of all the respondents on the Likert scale recalculated to create outcomes that allow comparison with the National Magnet Hospital Profile (NMHP; Schmalenberg & Kramer, 2008).

5 | DISCUSSION

The aim of the study was to evaluate the implementation of a PPM based on Magnet principles on the nurse work environment. Nurses perceived a significant improvement in their work environment on all the EOM subscales, although some subscales had not reached Magnet level by the 2019 survey. Nurses' job satisfaction and perception of quality of care also increased. Seventeen out of the 19 units also showed improvement in the nurse work environment.

To our knowledge, this is the first study in the Netherlands to describe the results of a D-EOM II and the deployed interventions. Comparing outcomes of the EOM subscales before and after interventions were deployed showed that the hospital achieved Magnet level scores on the subscales 'Clinical autonomy' and 'Control over nursing practice'. Clinical autonomy and control over nursing practice are dimensions of autonomy in clinical practice settings (Kramer et al., 2006). Clinical autonomy relies on nurses' clinical knowledge and judgement, while control over nursing practices relies on nurses' organizational knowledge and influence (Kramer et al., 2006). Autonomy can be increased by incorporating the unique knowledge and expertise of nurses into clinical patient care, for example through nurse-driven protocols and nursing standards (Rao et al., 2017). Furthermore, professional enrichment, education (Stansfield & Tapp, 2004), nurse leadership (Brady Germain & Cummings, 2010) and interprofessional teamwork (Sollami et al., 2015) are important strategies to improve nurse autonomy. Hospital leaders can promote autonomy by creating structures and processes that involve nurses in decision-making at multiple levels (Varjus et al., 2011). In our study, the focus on creating a professional working environment and implementing a shared governance structure as well as encouraging nurses to show leadership seemed to increase autonomy among nurses and nurses were supported by the organization to do so. Considering the strategies described in other research, we could focus more on nurse-driven protocols and interprofessional teamwork to improve nurse autonomy even further in the future.

Many of our interventions are related to development and education, so it was surprising that the subscales 'Clinically competent peers' and 'Support for education' did not reach Magnet level, despite improvements. However, we observed lower scores for the statements that high clinical competence and extra education is not rewarded, indicating that we provided enough career options but that nurses expect more rewards. Previous research has shown that nurses appreciate financial rewards such as monetary incentives, bonuses, individual extra payments, performance-related pay systems, and employer and fringe benefits (Homburg et al., 2013; Mudaly & Nkosi, 2015) as well as non-financial rewards such as training, opportunities to develop professionally at work, balanced work–life activities, recognition, and feedback (Li et al., 2011; Masum et al., 2016; Sveinsdóttir et al., 2016). Appropriate rewards are especially crucial to improving reward satisfaction and job satisfaction among registered nurses (Seitovirta et al., 2018). Therefore, hospital administrators and nurse managers need to build a fair and attractive reward system to improve nurses' job satisfaction and to promote excellence in performance (Hsu et al., 2015).

An interesting finding of our study was the improved score on the subscale 'Nurse–physician relationships'. According to nurses, their relationship with physicians developed into a collegial relationship in which both parties had equal but different influences (Schmalenberg & Kramer, 2009). To improve nurse–physician relationships, we made communication more effective by introducing the Situation-Background-Assessment-Recommendation (SBAR) tool, which was part of the clinical reasoning learning path. We also invested in increasing clinical competence through clinical reasoning and evidence-based practice learning paths. A previous study showed that physicians perceived a lack of nurses' competence as the major reason for poorer interdisciplinary collaboration

in a unit and a major barrier to collegial nurse–physician relationships (Schmalenberg & Kramer, 2009). An integrative review (Tan et al., 2017) on interventions to improve communication between nurses and physicians found that most interventions were targeted at nurses' communication skills. The SBAR tool was proven to be a generalizable intervention (De Meester et al., 2013). Research into effective interprofessional teamwork and communication has often mentioned interprofessional education (IPE; House & Havens, 2017; Sollami et al., 2015; Tan et al., 2017). IPE is when two or more members of a healthcare team (who participate in either patient assessment and/or management) learn with, from, and about each other as they collaboratively focus on patient-centred care and achieving optimal health outcomes. In IPE, knowledge and value sharing occur in and across disciplines (Olenick et al., 2010). A focus on IPE could help us to further improve nurse–physician relationships in the future.

Keyko (Keyko et al., 2016) conducted a systematic review on work engagement in professional nursing practice. Work engagement is most often defined as 'a positive, fulfilling, work-related state of mind characterized by vigor, dedication, and absorption' (Schaufeli et al., 2002). Based on the results of the systematic review, the Nursing Job Demands-Resources (NJD-R) model for work engagement in professional nursing practice was developed. This model showed that a wide range of individual, operational, and organizational factors are related to nurses' work engagement. We were not aware of the NJD-R model when we developed our PPM and interventions but will consider it in the future because it shows the relationships between antecedents of work engagement and outcomes in professional nursing practice. The NJD-R model may help us develop interventions to further improve the nurse work environment.

5.1 | Limitations

The results of this study should be interpreted in light of certain limitations. First, we cannot confirm a causal link between our interventions and the improvement in the nurse work environment. However, an association is probably because we used the Excellent Care Program and the Magnet principles, which has already been proven to improve the nurse work environment.

Second, we obtained the perspective of the project team (interventions) and nurses (DEOM-II questionnaire) of our hospital. To reach intersubjectivity and give the approach more rigour, we should examine the perspective of others (such as management and directors) during the 2016–2019 study period. This is a planned next step in our research. Also, two independent researchers (MvR and BB) were involved during the whole research process.

Thirdly, there is a lack of available comparative data from other Dutch hospitals. Although the outcomes suggested an improved nurse work environment, these findings need to be confirmed in a larger study with a stronger design such as a stepped wedge design.

5.2 | Implications for nursing practice

- If an organization starts implementing the Magnet principles, it should go hand in hand with a designated team and sufficient time, funding, skills and support of the overall organization including senior management.
- Describing the implemented interventions in detail can assist other hospitals to develop strategies by focusing on the nurse work environment.
- Frequently measuring the nurses' perception of their work environment using a questionnaire such as the EOM will serve the organization because it provides good insight into how nurses experience their work and it will serve nurses because it allows them to take responsibility and make clear what they need from the organization to perform well and give the best quality care.

6 | CONCLUSIONS

This study provides new evidence that implementing a PPM positively affects the nurse work environment in a Dutch hospital. The nurse work environment, job satisfaction, and perception of quality of care improved significantly after interventions were implemented. In Europe, there are only a few recognized Magnet hospitals. However, this study highlights the value of the Magnet principles in creating a healthy nurse work environment. The use of a PPM based on the Magnet principles can improve the nurse work environment, although prior research is essential for developing interventions. We could further improve the nurse work environment in our hospital by rewarding extra education and clinical competence, focusing on IPE and learning about work engagement.

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CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

AUTHOR CONTRIBUTIONS

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE*): (1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content. *http://www.icmje.org/recommendations/

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