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Home blood pressure telemonitoring in the Netherlands: a pilot study in GP practices

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Abstract

Background Home Blood Pressure Telemonitoring (HBPT) has been proposed to improve drug adherence, blood pressure control, and efficient care delivery in patients with hypertension. Its adoption in GP practices however remains low. In this pilot study we evaluated barriers and facilitators for successful implementation, patient satisfaction, clinical effectiveness, and efficiency for a HBPT project in Dutch GP practices by means of the Quadruple Aim Model.

Methods GP practices included patients with hypertension that were part of their regular cardiovascular disease program. We conducted semi-structured interviews at 3- and 6-months to identify barriers and facilitators for successful implementation. Patient satisfaction was measured with Telehealth Usability (TUQ)—and Mhealth App Usability (MAUQ) Questionnaires. A SPRINT-protocol blood pressure measurement was performed after the pilot project to assess clinical effectiveness. Efficiency data were collected on the number of registered consultations and practice measurements performed during the 6-month project.

Results Three GP practices included 19 patients. Barriers for implementation were a lack of a reimbursement structure, lack of information technology (IT) system integration and increased experienced workload when using HBPT. Facilitators included the positive effects on blood pressure control, increased sense of safety for patient and care provider, and increased disease-insight. Median satisfaction scores for TUQ and MAUQ questionnaires (scale 1–7) were 6 (IQR 5–6) and 6 (IQR 5–7). At baseline, 16% of the patients had a blood pressure < 140/90 mmHg. Based on the performed SPRINT measurements, 68% had a well-controlled blood pressure (< 140/90 mmHg) after 6 months. Average blood pressure improved from 151/89 mmHg to 132/81 mmHg ($p = < 0.05$). On average, one monthly contact moment related to hypertension between patient and GP practice was registered.

Conclusions We found positive results following the introduction of HBPT in GP practices on clinical outcomes and patients' satisfaction, however for large-scale implementation improvements with regards to organizational efficiency and a clear reimbursement structure are needed.

Keywords Hypertension, Telemonitoring, Digital health, General practice

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Introduction

An estimated 1.3 billion adults worldwide are affected by hypertension [1]. Despite lifestyle interventions and appropriate drug therapy, a considerable number of patients remain outside the target range of optimal blood pressure control, often due to non-adherence [2]. In countries with well-developed primary care, hypertension is the most common reason for contact with a general practitioner (GP) and it remains one of the most important risk factors for cardiovascular diseases (CVD) [3, 4]. CVD place a high burden on the overall healthcare budget in the Netherlands as it requires approximately 6.9% (equivalent to €6.7 billion) annually [5].

To improve adherence and blood pressure control, Home Blood Pressure Telemonitoring (HBPT) has been proposed [6]: patients measure their blood pressure at home, while being remotely monitored by their healthcare providers. Contemporary monitoring platforms use incorporated algorithms designed to assist in detecting patients that remain off target and allow for pro-active monitoring [7]. This enables early identification of high-risk patients requiring additional treatment or diagnostic interventions and low-risk patients requiring minimal physical care. These platforms also incorporate functionalities to coach patients on relevant lifestyle factors, for example by providing information on the importance of salt restriction or smoking cessation [7].

Besides the clinical challenges related to hypertension care, organizational challenges have recently become more and more relevant. Due to an increasingly ageing population, more patients suffer from chronic diseases like hypertension [8]. Since nowadays healthcare staff is scarce there is an obvious need to restructure traditional hypertension care. Hybrid care pathways, involving both physical care and digital care like HBPT have been suggested to partly resolve this issue by improving efficiency, for example by optimizing care distribution between on and off-target patients [7, 9]. Clinical trials on HBPT conducted in the UK and USA, encompassing both hospital and general practice (GP) settings, have demonstrated the potential of HBPT in enhancing adherence, blood pressure regulation and optimizing resource allocation [9–11]. HBPT could therefore contribute to achieving goals as described in the Quadruple Aim model [12]. This model aims to achieve comprehensive and sustainable healthcare improvements focusing on four key goals: enhancing patient experience, improving population health, reducing costs, and fostering a positive work environment for healthcare professionals.

The use of telemonitoring has significantly increased following the COVID-19 pandemic [13]. However, its adoption within the GP setting remains very limited, similarly for hypertension. A recent nationwide survey [14], assessing the viability of digital health interventions such as telemonitoring, revealed two major challenges: the lack of evidence substantiating its efficacy within the GP context, coupled with mixed viewpoints with regards to its capacity to improve efficient healthcare delivery. Furthermore, a clear and comprehensive organizational and reimbursement structure for large-scale implementation is yet to be established [15].

This pilot study aims to identify barriers and facilitators for implementation, evaluate patient satisfaction, clinical effectiveness, and efficiency, for HBPT within general practices in the Netherlands with emphasis on the perspectives as described in the Quadruple Aim model [12].

Methods

This study is reported in line with the CONSORT statement with the extension to pilot studies. The relevant checklist is provided in supplementary file 1.

Study design

Pilot study

Setting and recruitment

For the pilot project, GP practices, affiliated to the Maasstad Hospital, Rotterdam, the Netherlands, were recruited between January 1st 2023 and January 1st 2024. The goal was to include three (for practical feasibility) GP practices, each contributing a maximum of 10 patients. The recruitment of patients was carried out within each GP practice by the designated practice nurse. Written informed consent was obtained for all involved patients. Total duration of the pilot project was 6 months (Fig. 1).

Inclusion and exclusion criteria

For the participating patients in this study the following inclusion and exclusion criteria were used:

Inclusion criteria

- Age ≥ 18 years.
- Included in GP cardiovascular management program [16].
- Have and use a smartphone or a partner/caregiver who can provide the necessary technical support

Exclusion criteria

- Current user of a blood pressure monitor approved by the Dutch Heart foundation [17] in combination with the Luscii app [18]
- Persistent atrial fibrillation as indicated in the electronic health record (EHR).

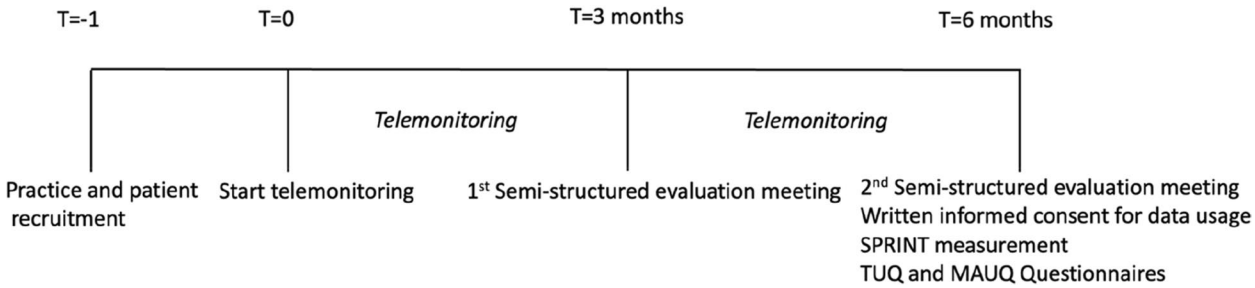

Fig. 1 HBPT pilot project overview. TUQ = Telehealth Usability Questionnaire. MAUQ is Mhealth App Usability Questionnaire

- Pregnant or planning to become pregnant during the study period.
- Severe kidney disease, defined as estimated glomerular filtration rate <30 per 1.73 m2 or currently on renal replacement therapy (i.e., hemodialysis or peritoneal dialysis)
- Unable to communicate (not language specific).
- Recent cardiovascular event (ischemic stroke, transient ischemic attack, myocardial infarction, coronary artery bypass grafting) in the past 3 months
- Diagnosis of dementia, psychosis as indicated in the electronic health record.
- Life expectancy < 1 year, for instance in terminal cancer or NYHA III or IV heart failure.
- Individuals requiring BP monitor cuff size larger than 42cm.
- Patients with proven secondary cause of hypertension for which drug treatment is not first choice (e.g., excessive licorice use, proven renal artery stenosis eligible for endovascular treatment)

Remote monitoring set-up

The HBPT set-up consisted of a monitoring platform, a monitoring device, and a monitoring algorithm.

As a monitoring platform, we used the Luscii [18] application. All patients were provided with an iHealth track KN 550BT blood pressure monitor [19] which has Bluetooth integration with the Luscii app.

The monitoring algorithm contains information about how often patients need to measure their blood pressure and describes details about alarm thresholds for the monitoring platform. We used the same monitoring algorithm that is used in the Telemonitoring and E-Coaching in Hypertension trial (TECH) [20], which evaluates the application of HBPT among patients in the hospital outpatient setting. The algorithm consists of five initial target value programs for blood pressures (< 180/110, < 170/105, < 160/100, < 150/95 and < 140/90 mmHg). These values do not represent the final treatment targets but serve as thresholds targets for triggering alerts. Higher blood pressure target values have more intense monitoring schedules and tighter alarm thresholds. When starting, the monitoring patients are enrolled in a target value program based on their initial blood pressure at baseline, hereafter they follow a stepdown approach; once the target value is achieved the patient will automatically be transferred in a lower target value program. Patients will remain in the < 140/90 mmHg group once this blood pressure value is met.

To facilitate secure communication on a patient level between GP practices and the hospital specialist during the pilot we used a separate platform that was already being used for remote digital interdisciplinary consultations (VipLive, Topicus B.V., Deventer, The Netherlands).

Monitoring procedures

At the start of the pilot (Fig. 2, procedures A), nurse practitioners from the Maasstad Hospital supported the included GP practices in training and monitoring of their patients. This initial support was provided because, despite the practices' familiarity with patients performing routine home blood pressure measurements, they lacked specific experience with HBPT. When off-level target blood pressures were detected the nurse specialist from the Maasstad Hospital contacted the GP or practice nurse, who decided to adjust medical treatment if necessary. The GP was responsible for the medical treatment of each patient throughout the pilot project. Once the staff of the GP practice felt in control, they took over the monitoring (Fig. 2, procedures B) and would only consult the hospital for complex medical cases requiring expertise from the Internal Medicine Specialists. Monitoring on GP level was primarily carried out by practice nurses under supervision of GPs.

Data collection

During the pilot project semi-structured interviews (see supplementary material 2 for the interview guide) with both the practice nurse and GP were conducted at

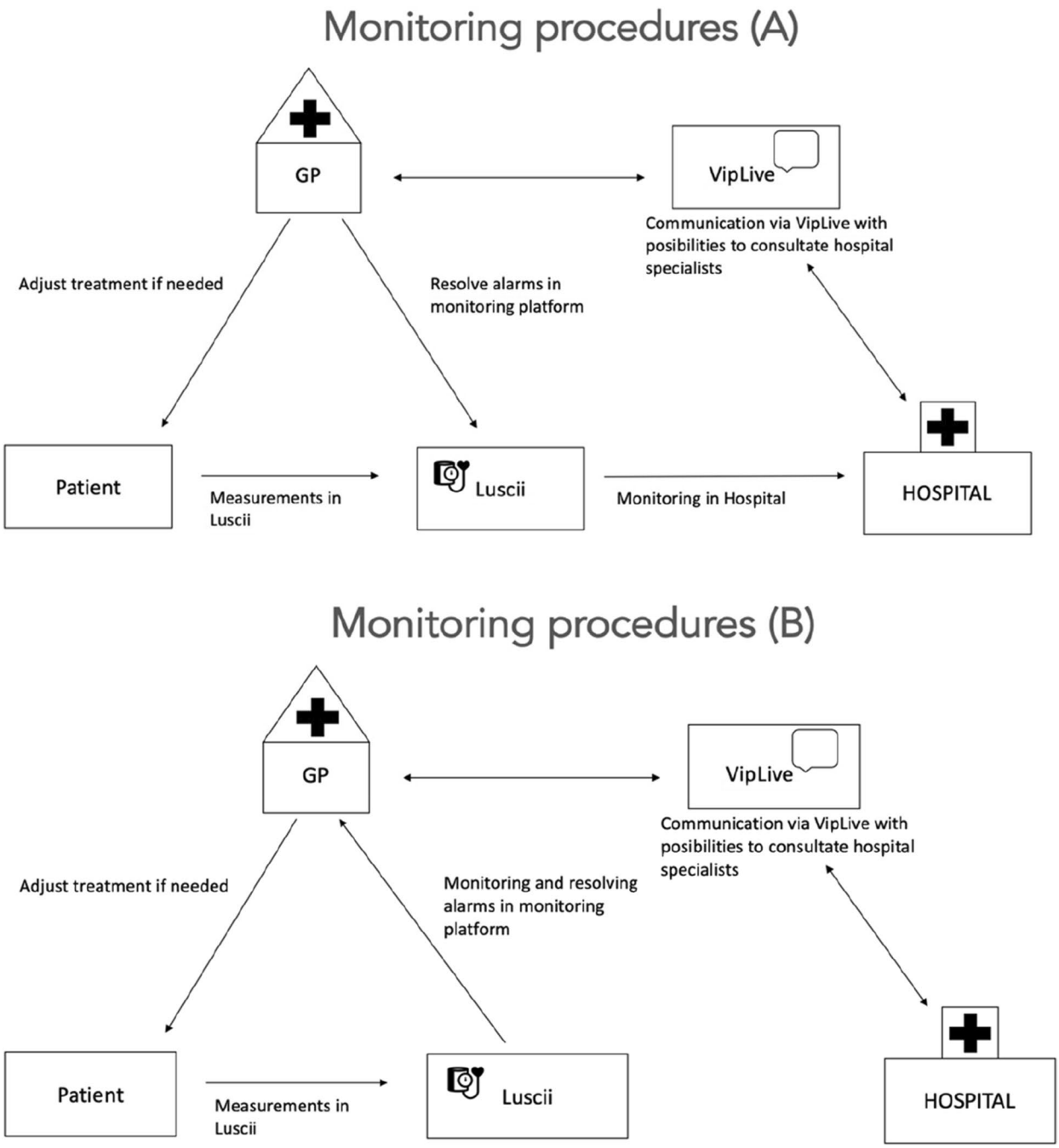

Fig. 2 Monitoring procedures **A** and **B** used in the pilot project. During the first phase of the pilot project monitoring was carried out by the hospital (**A**). After a few weeks, monitoring was taken over by the GP and practice nurse (**B**). Throughout the pilot communication was possible via a separate communication platform

3 and 6 months. During these interviews we evaluated the monitoring process to identify barriers and facilitators for successful implementation of HBPT. Interviews were performed by one of the involved researchers (JvS). Given the small size of the semi-structured interviews we transcribed and coded the interview notes in Microsoft Word [21].

To assess patients' satisfaction with the BP monitoring app and the overall remote monitoring process we used the validated Mhealth App Usability

Questionnaire (MAUQ) [22] and Telehealth Usability Questionnaire (TUQ) [23] respectively. These questionnaires were translated to the Dutch language and provided after the pilot project ended to each participant using Castor Electronic Data Capture System [24].

To be able to gain insight in the effects of HBPT on blood pressure control all participants underwent a standardized blood pressure measurement (SPRINT protocol [25]) after 6 months. These measurements were compared with the average blood pressure of the first three home measurements at the start of the pilot project.

Data was collected on the number of consultations between the GP or practice nurse and the patient during the study period, the number of office blood pressure measurements and the frequency of consultations with the hospital specialists for the participating patients during the pilot project.

Analysis

Barriers and facilitators were identified independently from the answers provided to the interview questions by the two involved researchers (JB, IV). The qualitative analysis was performed according to the procedures described by Kuckartz [26]. Coding was performed deductively and was based on Thematic Content Analysis (TCA). The codes (categories) corresponded to the four distinct Quadruple Aim goals [12]. Overall conclusions on the barriers and facilitators were based on discussions between multiple involved researchers (JB, SJ and IV).

Data from the questionnaires, blood pressure regulation and number of consultations were analyzed using R [27]. To assess blood pressure differences, we used a paired T-test. Data are either expressed as mean (SD or 95% CI) data or median (IQR). A p-value < 0.05 is considered statistically significant.

Results

GP practices

Between January 1st 2023 and November 1st, 2023, three GP practices took part in the pilot project. A total of 19 patients were included. The mean age (SD) was 60 (± 8), 58% were females and baseline average blood pressure was 151/89 mmHg. Patient adherence was 100% across all participating practices. Baseline characteristics of the GP practices and patients are presented in Table 1.

Semi-structured interviews—barriers

During the interviews, all three practices shared the view that HBPT has a lot of potential. However, there are important barriers to overcome with regards to the monitoring organization, suitable monitoring protocols, patient selection, system integration, and the absence of a reimbursement structure for a digital health intervention like HBPT. Complete results of the semi-structured interviews on Quadruple Aim and practice level can be found in Supplementary Table 1.

Semi-structured interviews—facilitators

Important facilitators for successful implementation encompassed enhanced disease insight among healthcare providers and patients, improved sense of safety, increased care provider attention and the relatively accessible interaction and collaboration between the hospital and the GP practice. Complete results of the semi-structured interviews on Quadruple Aim and practice level can be found in Supplementary Table 1.

Patient satisfaction

Questionnaires were fully completed by 63% of patients. Satisfaction was scored on 21 individual items in each questionnaire using a 1 to 7 Likert scale. We found high overall satisfaction, with a median (IQR) TUQ score of 6 (5-6) and a median MAUQ score of 6 (5-7). Overall results of the satisfaction questionnaires can be found in Table 2.

Table 1 Baseline Characteristics on participating GP practices and patients

	Practice 1	Practice 2	Practice 3	Overall
Location	Spijkenisse	Spijkenisse	Spijkenisse	-
Number of GPs	6	1	8	-
Number of patients registered	12,258	3134	12,233	-
Number of practice nurses	3	1	2	-
Weekdays with practice nurse present	5	2	5	-
No of patients included in pilot project	9	8	2	19
Age, mean (SD)	56 (± 10)	57 (± 3)	61 (± 8)	60(± 8)
% Female	67%	63%	0%	58%

Data is expressed as mean (± SD). *GP* general practitioner

Table 2 Satisfaction and efficiency outcomes

	Practice 1	Practice 2	Practice 3	Overall
Overall TUQ score (IQR)	6 (5–6)	6 (5–6)	5(5–6)	6 (5–6)
Overall MAUQ score (IQR)	6 (5–7)	6 (6–7)	6 (5–6)	6 (5–7)
Average number of practice measurements (SD)	0 (0)	4 (3)	0 (0)	2 (3)
Average number of registered contacts with practice (SD)	8 (6)	4 (3)	4 (1)	6 (5)
Number of medical consultations with hospital specialist performed by GP	1	1	1	3

Data is expressed as median (IQR), mean (SD) or absolute numbers. *MAUQ* Mhealth App Usability Questionnaire. *TUQ* Telehealth Usability Questionnaire, *GP* General Practitioner)

Table 3 Blood pressure at T = 0 and T = 6 months

	T = 0	T = 6 months	*P*-value
Mean systolic blood pressure	151 (± 21)	132 (± 13)	< 0.05*
Mean diastolic blood pressure	89 (± 13)	81 (± 11)	< 0.05*
% on target blood pressure (< 140/90 mmHg)	16%	68%	-

Data is expressed as mean (± SD). *A *p*-value < 0.05 is considered statistically significant

Blood pressure regulation

Average blood pressure was 151 mmHg (± 21) and 132 mmHg (± 15) systolic and 89 mmHg (± 13) and 81 mmHg (± 11) diastolic at baseline based on the first three performed home measurements ($p < 0.05$)) and after 6 months ($p < 0.05$) based on the SPRINT measurement respectively.

Overall, 16% of patients had a blood pressure below 140/90 mmHg prior to the initiation of HBPT and this increased to 68% after 6 months. One patient showed a clinically relevant increase (5 mmHg diastolic increase) in blood pressure over the study period. Overall blood pressure results are presented in Table 3.

Efficiency outcomes

During the pilot an average (SD) of 8 (± 6), 4 (± 3) and 4 (± 1) contact moments were registered between the GP and the patients for practice 1, 2 and 3 respectively. Patients with a blood pressure < 140/90 mmHg at the start of the pilot had an average number of contacts with the GP practice of 4 (± 3) compared to 6 (±) for patients with a blood pressure > 140/90 mmHg ($p = 0.13$). There were notable differences between all practices in terms of additional practice measurements performed. Two practices did not perform any additional practice measurements and solely managed their patients remotely whereas one practice still felt it was needed to perform 30 additional practice measurements among 7 of their participating patients (average 4, SD = 3).

Three consultations of the GP with the hospital specialist were needed during the pilot period. These were complex hypertension cases and would be referred for a hospital consultation if the HBPT program was not in place. No patients were referred to the hospital for a physical consultation regarding their BP during the pilot period. Overall results of the efficiency outcomes can be found in Table 2.

Discussion

In this pilot study we aimed to identify barriers and facilitators for HBPT in GP practices in the Netherlands. Additionally, we evaluated patient satisfaction, clinical effectiveness, and efficiency for the HBPT program. A Quadruple Aim Perspective [12] was used throughout the study. Barriers for larger implementation that were identified included the intensity of the monitoring algorithm, a lack of a clear reimbursement structure for HBPT and the lack of software system integrations between the Electronic Health Record (EHR) and the Luscii [18] application. Facilitators included an accessible collaboration between hospital and GP and an increased sense of safety and disease insight for both patients and health care providers. HBPT in three large GP practices led to overall high patient satisfaction and to a trend towards improvements in blood pressure and hospital referrals.

Care team wellbeing and organization

During the HBPT project we transformed a traditional care pathway into a hybrid care pathway using both the GP and hospital care. Additionally, we used a pro-active monitoring platform- and algorithm [18] to create a unique monitoring set-up. We found no existing literature using similar monitoring procedures and the novelty of this new 'care pathway' should be considered when interpreting the efficiency results.

The GP practices in this study noticed an increased workload while using remote patient monitoring which partially contradicts existing literature showing a

reduction in resource use when using HBPT [28]. This increased workload experience is however in line with studies where the conventional organization was not equipped to cope with this demand of patient engagement [29]. The previously mentioned novelty of the care pathway, the lack of system integration, and lack of experience with HBPT has probably contributed to this which has been suggested by previous studies [30]. There was also variation in the way the care path was really transformed and implemented, which is supported by the differences between the number of contact moments and practice measurements among the GP practices. It is also important to note that during this pilot project we used the HBPT monitoring algorithm from the outpatient hospital setting, which was largely based on hospital and medical specialist guidelines. However, specific GP guidelines for hypertension in the Netherlands recommend less blood pressure monitoring with standardized home measurements twice a year for non-diabetics and four times a year for diabetics. With the algorithm used in this pilot project, patients often had to measure daily or at least daily for one week every month. So a less intensive algorithm, more tailed to the GP setting, might reduce the workload as well.

Additionally, an increasing number of hospitals using HBPT use a central monitoring center with a telenurse in most cases [31]. These nurses are designated to monitor patients daily. They act like a filter to remove unnecessary alarms and seek contact with patients to discuss their complaints if needed. In the Netherlands, GPs or GP care groups currently do not have such facilities in place and therefore in this pilot, the practice nurses had to carry out all the monitoring work. This strongly attributed to the experienced workload. A logical and more efficient set-up would be to work with central monitoring in the GP setting, where a telenurse from a regional monitoring center, for example in an affiliated hospital, would monitor the GP patients to optimize efficiency. GPs will remain medically responsible for their patients and hospital specialists will, in line with current practice, only be consulted for complex hypertension cases when required. Implementing this setup was not feasible at the beginning of the project, primarily because of the limited experience with telemonitoring in the GP setting, which initially made practice-level monitoring the more logical choice.

Enhancing patient experience

In this pilot study, overall satisfaction with the monitoring program was very high. This was largely due to the enhanced sense of safety, comfort, and a strong connection with the hospital specialist. Previous studies performed in various settings on telemonitoring found similar results with improved patient experiences in terms of quality of life and quality of care [32, 33]. Additionally, we tried to improve accessibility of care, by also having caregivers or family members carry out the measurements as stated in the inclusion criteria. We were however unable to collect data indicating the frequency in which this occurred.

Reducing costs

During the pilot three hospital referrals were prevented due to the communication and collaboration possibilities between the GP and hospital that were part of the HBPT program. Allowing both parties to have access to the blood pressure data in the monitoring platform further facilitated this. Our relatively broad inclusion criteria excluded a population of patients that were inclined to be the referred to the hospital. This finding in combination with the small sample size of this study again highlights the potential of HBPT in reducing costs by decreasing unnecessary hospital referrals for hypertension.

All general practitioners consistently reported encountering a substantial obstacle in the implementation HBPT due to the absence of a reimbursement framework for digital health interventions like HBPT for GPs, a concern underpinned by various existing studies [7, 14]. Given the considerable investments in both time (for implementation) and resources (including the purchase of blood pressure monitoring devices and monitoring licenses) required to initiate HBPT, uncertainties surrounding reimbursement constitute an important issue. Consequently, GP practices are required to forge local agreements with monitoring platform providers, insurance companies, and collaborating regional hospitals or GP practices. The process of establishing these agreements is difficult and often time-consuming which causes uncertainty and further delays HBPT implementation [34]. This study underscores the need for the development of a structured reimbursement system tailored to GP practices for digital health interventions like HBPT.

Improving population health

After 6 months of HBPT, we observed that blood pressure control improved in over 68% of the participating patients. This is in line with existing literature on HBPT evaluations in both GP practices in and in hospitals [11, 35, 36]. What's relatively new however, is the use of a pro-active monitoring algorithm, which helps healthcare providers in proactively identifying high and low risk patients. This distinction allows follow-up intervals to be adjusted to shift more care provider attention to the identified high-risk patients. This could potentially lead towards an improvement in overall population health. Large evaluations encompassing HBPT

platforms with 'clinical algorithms' or 'clinical engines' are lacking, and this pilot study underscores it's potential and the need for such studies on a larger scale.

Limitations

The small study size and design need to be clearly considered when interpreting the clinical and efficiency results of this study. Specifically for the questionnaires, the relatively low response rate and the potential involvement of caregivers or family members in the responses might have influenced the reported satisfaction results. Also, because of the low number of GPs involved, data saturation for the semi-structured interviews was hard to reach. Additionally, we would like to point out that calculating the average blood pressure from three consecutive measurements is not in line with current guideline recommendations [37]. Finally, the involved GPs have a significant interest in using digital health applications given their participation in the pilot project and their views should be generalized with caution. However, we do believe that these three GP practices adequately represent current practices with HBPT especially given the overall low application of HBPT combined with the absence of scientific evaluations in the Netherlands to this regard.

Conclusions

This pilot study on HBPT in Dutch general practices highlighted additional steps with regards to organizational aspects and reimbursement models that need to be taken for the broader adoption of HBPT. To do so, the establishment of large-scale centralized monitoring for GPs appears to be the preferred approach. Additionally, we found a positive influence of HBPT on patient satisfaction and blood pressure control in this small study. We recommend conducting a large prospective evaluation with central monitoring and a monitoring algorithm based on GP guidelines for hypertension to accelerate large-scale implementation.

Abbreviations

BP	Blood pressure
CVD	Cardiovascular Diseases
EHR	Electronic Health Record
GP	General Practitioner
HBPT	Home Blood Pressure Telemonitoring
IT	Information Technology
MAUQ	Mhealth App Usability Questionnaire
NZA	Dutch Healthcare Authority
SPRINT	blood pressure measurement: standardized blood pressure measurement as used in the SPRINT trial (25). Three consecutive blood pressure measurements following an initial 5-min rest and a 5-min interval between each measurement
TUQ	Telehealth Usability Questionnaire

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s44247-024-00072-1.

Additional file 1: Supplementary file 1. CONSORT 2010 extension to pilot studies checklist. Description of data: This file contains the CONSORT 2010 extension to pilot studies checklist.

Additional file 2: Supplementary file 2. Interview guide for semi-structured interviews at T = 3 months and T = 6 months. Description of data: This file contains an English translation of the interview guide we developed to conduct all semi-structured interviews at T = 3 and T = 6 months.

Additional file 3: Supplementary Table 1. Quadruple aim goals (QAG); reported barriers and facilitators during the interviews at the general practices (GPs and Practice nurse). Description of data: This file contains a table with the final results (barriers and facilitators) from the semi-structured interviews.

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Authors' contributions

JvS and SJ were responsible for drafting the protocol and recruiting GP practices. JvS, IV and SJ carried out the study and JvS conducted the semi-structured interviews. JvS conducted all analyses. All authors (JvS, JV, IV, and DD) were involved in interpreting the results and drafting the manuscript.

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Institutional Review Board (IRB) of The Maasstad Hospital, The Netherlands (identifier L2023003). This study was assessed not to be subject to the Dutch Medical Research Involving Human Subjects Act (WMO) by the Medical Ethics Committee United (MEC-U, identifier W23.091). All methods described in this study were performed in accordance with relevant guidelines and regulations, including Good Clinical Practice guidelines and applicable laws and regulations. All patients consented to participate prior to the beginning of the pilot project and written informed consent was obtained for all involved patients to use the data for this study after the pilot project was finished.

Consent for publication

Not applicable.

Competing interests

Job van Steenkiste, MD: nothing to declare. Iris Verberk, MD, PhD: nothing to declare. Jorie Versmissen, MD, PhD: nothing to declare. Daan Dohmen, Prof, PhD: Prof. D. Dohmen is the CEO of Luscii, the involved HBPT platform used for the purpose of the described pilot project. There was no financial support provided by Luscii to facilitate this pilot study or the pilot project. Sjaam Jainandunsing, MD, PhD: nothing to declare.

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