

Evaluation of Mid & South Essex Integrated Care Board BP@HOME Scheme

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Publication date: Thursday 31 August 2023

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**Acknowledgments**

The team would like to thank the participants for their level of engagement and willingness to share their experience with the team.

## Background

In 2019 high blood pressure was the leading risk factor worldwide, with almost 11 million deaths attributable to it[[1]](#footnote-1). In the same year in England high blood pressure was the second leading risk factor after smoking accounting for almost 70 thousand deaths; and 8,000 in the East of England.

The BP@home scheme aims to increase the availability and access to home blood pressure monitoring for patients with poorly controlled hypertension. Hypertension is the biggest long-term condition in the UK affecting 1 in 4 adults, half of whom are undiagnosed or their blood pressure is not controlled[[2]](#footnote-2). For every 100 people treated with anti-hypertensives 1 heart attack is avoided[[3]](#footnote-3). Regular home blood pressure monitoring across a population of 50,000 patients could prevent up to 300 heart attacks and 477 strokes over three years[[4]](#footnote-4). Approximately 190,000 Mid and South Essex patients are currently on the hypertension register with an average rate treated to target across Mid and South Essex being 64.76%, indicating the need for further monitoring and reviewing to increase levels of controlled blood pressure[[5]](#footnote-5).

As of July 2023, over 80,000 patients have monitored their blood pressure at home and fed back their results to their local Practice, however these include those that are not on the hypertension register, and those that have opted to take their BP at home without being identified by a clinical staff member[[6]](#footnote-6).

The University of Essex (UoE) was commissioned by Mid and South Essex Integrated Care Board (MSE ICB) to provide an independent overview of the BP@Home Programme. Using a mixed-method approach, this report presents the analysis of the data collected through the BP@Home online survey and data collected through 22 one-to-one interviews to a sample of respondents to the online survey.

The MSE ICB and UoE teams worked collaboratively to ensure access to data and participants. UoE has independently conducted the analysis of the data and drawn the conclusion.

## Ethics

Ethical approval was provided for all elements of the project by the University of Essex Ethics Sub Committee 2 (ETH2223-0828).

## Methods

### Quantitative analysis

Data collected through the online survey have been analysed using descriptive statistics. All sample (n=260) has been included in the analysis. Descriptive statistics have been used.

A remote blood pressure monitoring survey, using MS Forms, was created in September 2022 by the MSE ICB, it was extended to the 4th November to improve number of survey responses received. In March 2023 the survey was reopened for a further two weeks targeting specifically those residents who were part of the BP@Home programme.

The survey was shared to patients via the GP practices involved in the BP@Home programme. MSE ICB also sent the survey out to 1200 members of the citizens panel, ‘Virtual Views’. The survey was promoted via the MSE social media channels and the MSE health inequality groups.

### Qualitative analysis

Of the 260 participants 166 of the respondents provided their email address and provided an initial consent to be contacted for follow-up interviews.

A semi-structured interview schedule was co-developed by the MSE ICB engagement team and the UoE team. Participants were first contacted by the MSE ICB engagement team via email and followed up by email and phone by the UoE researcher to arrange interviews. Interview appointments were arranged at the convenience of participants who were given the choice of video or telephone interviews. A copy of the information sheet and consent form were sent 24 hours ahead of interviews. A thematic analysis was conducted to analyse the data collected through the interviews.All interviews were recorded, and auto transcribed. Transcripts were coded in word and then analysed using a thematic framework in Excel to produce this report. An identifier (e.g., F1 age…) has been used for all participant comments and all comments are anonymised as much as it was possible to do. The transcribed comments have been edited in places to ensure anonymity, to remove repeated words, or to make points more concise. In these cases, editing of original words is indicated through […..]. Please note that the transcripts were only auto transcribed and although additional time was spent listening back to the original recordings to improve the accuracy this was limited by the time available.

## BP@Home survey: quantitative analysis results

This section provides a detailed analysis of the BP@Home online survey. Different themes have been identified and presented in a systematic and comprehensive way.

### Socio-demographic characteristics

In Table 1, we present the sociodemographic characteristics of the sample, comprising 260 respondents. Among them, 48.8% (n=127) identified as male, 46.9% (n=122) as female, and one person self-identified as non-binary. The majority of respondents (68.5%) were aged 65 years and above, with the largest group falling in the 65 to 74 age group (40%). Regarding ethnicity, 95.2% of respondents identified themselves as white (English, Welsh, Scottish, Northern Irish, or British). Geographically, 40% (n=107) of participants resided in Basildon Borough Council, followed by Thurrock (n=67, 25.8%) and Southend-on-Sea City Council (n=35, 13.5%).

Among the participants who responded to the question about their financial status (n=187), the majority (n=145) reported being in a stable/good financial position, while a smaller number (n=42) indicated having limited economic resources. A high proportion (97%) of respondents had internet access through broadband or mobile phones.

*Table 1 – Sociodemographic characteristics (n=260)*

| Variable | Categories | n | % |
| --- | --- | --- | --- |
| Gender | MaleFemaleNon-binaryPrefer not to say/missing | 127122110 | 48.846.90.43.8 |
| Age | 25 to 4445 to 5455 to 6465 to 7475 to 8485 and overPrefer not to say/missing | 1021511046382 | 3.88.119.640.024.23.11.2 |
| Ethnicity | White - English, Welsh, Scottish, Northern Irish or BritishOther (including missing) | 24515 | 94.25.8 |
| Place of residence | Basildon Borough CouncilBraintree District CouncilBrentwood Borough CouncilCastle Point Borough CouncilChelmsford City CouncilMaldon District CouncilRochford District CouncilSouthend-on-Sea City CouncilThurrock CouncilMissing | 10713132110135672 | 41.25.00.41.28.13.80.413.525.80.8 |
| Disability | NoYesMissing | 14210810 | 54.641.53.8 |
| Financial status | Not enough money for basic needs Just enough money for basic needsMore than enough money for basic needs (some saving) More than enough money for basic needs (a lot of savings)Prefer not to say/missing | 7351083773 | 2.713.541.514.228.1 |

### Access to, use of, and feelings about the BP monitor

Access to, usage, and feelings about the BP monitor were examined among the participants. Most of the participants (**Figure 1**) acquired the device independently (n=107, 41%), or upon advice from their GP (n=110, 42%), or advised by a non-clinical professional (n=7, 3%). Among the 260 respondents only 15 participants (6%) received their BP monitor through their GP.

*Figure 1 – Source of BP monitor*

**Figure 2** shows that a significant portion (n=206, 79.2%) had been using the BP monitor at home for over a year, with less than 20% being recent users (less than a year).

*Figure 2 – Time since the use of the BP monitor (n=260)*

The reasons underpinning the use of the BP monitor (**Figure 3**) are mostly (n=116, 45%) identified by participants as being in high-risk category (e.g. at risk of high blood pressure, age, obesity) and having a health condition (n=69, 27%). A non-negligible proportion (n=31, 12%) is using the BP monitor to monitor their own health and wellbeing or for diagnostic purposes (n=17, 6%).

*Figure 3 – Reasons for using a BP monitor (n=260)*

Regarding ease of use, 157 out of the 191 participants, who provided a response, strongly agreed that they found it easy to take blood pressure readings with the monitor, with an additional 21 slightly agreeing.

When asked about their feelings upon the first use of the BP monitor, a majority (n=91) expressed positive emotions such as feeling "safer," "motivated," "empowered," "cared for," "happy," and "relieved." A small number (n=8) felt "annoyed," and 86 participants reported feeling "anxious," with nearly half of them (n=44) associating the term "anxious" with positive emotions like feeling "motivated," "empowered," and "safe." Additionally, 63 participants couldn't specify their feelings.

Half of the participants accessed online information, such as the NHS website, to gather further information specific to their BP monitor model, enabling them to monitor their blood pressure effectively.

### GP role and follow-up

When inquired about whether monitoring their blood pressure was a request from their GP, 37% (n=96) of the respondents answered affirmatively, while 51% (n=132) responded negatively, and just over ten percent couldn't remember or didn't know.

Regarding contact with their GP due to using the BP monitor, 32% (n=64) of participants with valid answers had done so for blood pressure-related reasons, 25% (n=51) for other reasons, while 37% (n=75) had not contacted their GP (Figure 4).

*Figure 4 – Contact with the GP (n=201)*

Out of the 96 participants who began monitoring their blood pressure at the request of their GP, 93 offered further insights regarding follow-up contact from their GP clinic. Among these, 76% (n=71) received a follow-up due to various reasons, such as abnormal readings (too high or too low), lack of submitted readings (either not submitted at all or not as frequently as needed), prescription of medication, or to assess the effectiveness of the BP monitor's use. Conversely, 24% of participants did not receive any follow-up call.

### Information about blood pressure and blood pressure monitoring

Participants were asked about the level of information and advice received from the GP/clinic in relation to blood pressure (**Table 2**). Among those who provided responses (sample size indicated in brackets in Table 2), over fifty percent reported receiving information on expected systolic and diastolic blood pressure ranges for normal blood pressure (54.3%), risks associated with extreme blood pressure levels (57.1%), lifestyle changes (50.0%), and BP medication (70.7%). However, less common were participants who received information on the significance of blood pressure for individual health (36.8%), the benefits of home blood pressure monitoring (39.6%), and, notably, what to do in the event of a reading being too high or too low (38.7%).

*Table 2 – Level of information and advice received*

|  |  |  |  |
| --- | --- | --- | --- |
|  | No | Yes | Unsure or can'tremember |
| Information on what blood pressure is (n=247) | 108 (43.7%) | 91 (36.8%) | 48 (19.4%) |
| Information on what the 'normal' blood pressure range is for me (n=173) | 66 (38.2%) | 94 (54.3%) | 13 (7.5%) |
| Information on the risks associated with high/low blood pressure (n=170) | 58 (34.1%) | 97 (57.1%) | 15 (8.8%) |
| Information about the benefits of monitoring blood pressure at home (n=164) | 80 (48.8%) | 65 (39.6%) | 19 (11.6%) |
| Advice on what to do if a blood pressure reading is too high or too low for me (e.g. call my GP, go to A&E) (n=163) | 90 (55.2%) | 63 (38.7%) | 10 (6.1%) |
| Advice on changes to lifestyle (e.g. exercise or diet) (n=168) | 67 (39.9%) | 84 (50.0%) | 17 (10.1%) |
| Medication to control my blood pressure (n=181) | 48 (26.5%) | 128 (70.7%) | 5 (2.8%) |

Upon specific inquiry about instructions provided by their GP, the majority of respondents who provided a response found the instructions for submitting the readings (**Table 3**) easy to follow. Likewise, they found the process of submitting the readings straightforward. However, a smaller number of participants were clear on how the submitted readings were to be used.

*Table 3 – Instructions for BP reading submission to the GP*

|  |  |  |  |
| --- | --- | --- | --- |
|   | Agree(strongly/ slightly) | Disagree (strongly/slightly) | Neither |
| The GP practice clearly explained to me what happens with the blood pressure readings I submit to the practice (n=227) | 76 (33.5%) | 93 (41.0%) | 58 (25.6%) |
| The instructions on how to submit blood pressure readings to the GP practice were clear (n=180) | 93 (51.7%) | 55 (30.6%) | 32 (17.8%) |
| I find it easy to submit blood pressure readings to the GP practice (n=174) | 115 (66.1%) | 32 (18.4%) | 27 (15.5%) |

### Frequency of readings and submission of readings

Among those respondents who were asked to check their blood pressure (**Figure 5**), some of them were instructed to do so more than once a day or daily (13%). A smaller proportion of participants were asked to check their blood pressure a few times a week (6%) or once a week (13%). Just over forty percent had been asked to check their blood pressure less than once a week.

*Figure 5 – Frequency of reading as from GP instructions*

The two primary methods used by participants to submit their readings to the clinic were over email (33.1%) and on paper (43.1%). A smaller proportion of participants submitted their readings through apps/website or by phone. (**Figure 6**).

*Figure 6 – Method of submission of BP readings*

However, a significant portion of respondents, 47.7% (n=124), had discontinued submitting their readings at the time of the survey. On the other hand, 44% (n=115) continued to submit the readings as advised, while the remaining 21 participants deviated from the prescribed frequency. Surprisingly, when analysing the continuity in submitting readings across users based on the time (more/less often) since they acquired the BP monitor, no significant differences in behaviour were observed. Both those using the monitor for less than two months and those using it for over a year exhibited a split, with 50% continuing to submit readings and 50% discontinuing (**Figure 7**). However, for those who had the BP monitor for less than a year but more than two months, a larger proportion had stopped submitting the readings as advised.

*Figure 7 – Continuity in reporting readings by time since getting the BP monitor*

### Preference and motivation

Among the participants, 50.0% (n=130) confirmed their preference for blood pressure monitoring remains the at-home option. However, a notable 12.3% (n=32) of respondents expressed a preference for a healthcare professional, including pharmacists, to take their blood pressure.

Participants who provided valid responses consistently agreed on the benefits of measuring their blood pressure at home (**Figure 8**). The majority (87.9%) agreed completely or slightly that home monitoring made them proactively interested in maintaining their health. Additionally, 76.4% agreed on better understanding their blood pressure and its role in their health, while 69.6% felt more motivated to check their blood pressure. Most respondents agreed that having a BP monitor at home saved them time (78%) and provided peace of mind (72.5%). However, respondents were less confident about the impact of home monitoring on adopting healthier lifestyles (51.8% expressed some degree of agreement) or whether their blood pressure had stabilized or improved since starting the monitoring (41.0% expressed some degree of agreement).

*Figure 8 – Perception of the impact of having access to a BP monitor at home*

### Digital skills

The vast majority of participants who provided valid responses on digital skills displayed a high level of confidence in using various digital tools (**Table 4**). Specifically, 84.4% strongly or slightly agreed that they have a high degree of confidence in using apps for tasks like banking or booking. Moreover, 94.9% expressed confidence in searching online using tools like Google, and 90.6% felt at ease using emails and text messaging, including instant messaging apps like WhatsApp. Additionally, over seventy percent of respondents reported feeling confident in using video call platforms such as Zoom or Microsoft Teams.

*Table 4 – Digital skills (%)*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Agree strongly | Agree slightly | Disagree slightly | Disagree completely | Neither agree or disagree |
| I am confident using apps to carry out day to day tasks (e.g. banking, booking travel) (n=256) | 63.3% | 21.1% | 3.9% | 5.5% | 6.3% |
| I am confident using online search tools to look for information (e.g. Google) (n=217) | 75.1% | 19.8% | 0.5% | 2.8% | 1.8% |
| I am confident using written communication such as email, Whats App, text (n=213) | 73.2% | 17.4% | 1.4% | 2.8% | 5.2% |
| I am confident using on-screen/video communication such as facetime, Zoom, Teams or Skype (n=202) | 50.5% | 21.8% | 10.9% | 9.4% | 7.4% |

When asked whether they would consider an app or website to submit BP readings to the GP, over 65% of the respondents would probably/definitely use them; 18% of respondents would definitely/probably not, while an 11% of respondent was unsure (**Figure 8**). Finally 77% of the respondent wouldconsider monitoring health or wellbeing measures beyond blood pressure.

*Figure 8 – Willingness to use an app/website to submit BP readings*

## BP@Home interviews: qualitative analysis results

The sample was drawn from a list of those who had agreed to be interviewed with email contact details provided by MSE ICB. Selection from this list was purposive to include residents from different councils (12 Essex, 5 Southend & 5 Thurrock) and prioritising those who had received a GP loaned monitor. Twenty-two people participated (**Table 5**). There were 7 women and 15 men resident in different council areas as per the target. 2 participants described themselves as Black, Black British Caribbean or African - African, 1 as Mixed or multiple ethnic groups - White and Asian, 1 as Irish and 18 as White - English, Welsh, Scottish, Northern Irish, or British. Two participants were adults with learning disabilities who lived in supported accommodation and were interviewed with their care manager.

*Table 5 - Interview participants*

| **Gender** | **Age** | **Reason for BP@ home** | **Source of monitor** | **Council**  |
| --- | --- | --- | --- | --- |
| Female | 69 | Health condition | GP loan | Thurrock Council |
| Male | 77 | High risk | GP loan | Maldon District Council |
| Female | 57 | Want to monitor | GP loan | Maldon District Council |
| Female | 51 | Health condition | GP loan | Maldon District Council |
| Male | 65 | High risk | GP loan | Southend-on-Sea City Council |
| Male | 60 | Health condition | GP loan | Maldon District Council |
| Female | 74 | High risk | GP loan | Thurrock Council |
| Male |  50 | Whzan observations  | GP loan | Chelmsford City Council |
| Male |  60 | Whzan observations  | GP loan | Chelmsford City Council |
| Male | 65 to 74 | Health condition | Advised by clinician | Maldon District Council |
| Male | 79 | High risk | Advised by my GP to buy one  | Basildon Borough Council |
| Female | 39 | Health condition | Advised by my GP to buy one  | Southend-on-Sea City Council |
| Female | 65 to 74 | Health condition | I decided to buy one | Southend-on-Sea City Council |
| Male | 52 | Health condition | I decided to buy one | Thurrock Council |
| Male | 44 | High risk | I decided to buy one | Basildon Borough Council |
| Male | 43 | Pre-Hypertension; | I decided to buy one | Thurrock Council |
| Male | 72 | Want to monitor | I decided to buy one | Southend-on-Sea City Council |
| Female | 50 | High risk | I decided to buy one | Basildon Borough Council |
| Male | 68 | Want to monitor | I decided to buy one | Southend-on-Sea City Council |
| Male | 72 | Health condition | I decided to buy one | Basildon Borough Council |
| Male | 72 | High risk | I decided to buy one | Chelmsford City Council |
| Male | 35 | Health condition | I decided to buy one | Braintree District Council |

###

### Reasons for taking blood pressure at home

Twelve participants had been taking their blood pressure at home for over a year and a few of these for many years. Except for two people with learning disabilities who were part of a remote monitoring scheme all these participants had originally purchased their own monitors. They were monitoring their blood pressure in relation to managing other long-term conditions, or because they had previously been diagnosed with hypertension or identified as at high risk. Two participants had pregnancy induced hypertension and had been home monitoring since the birth of their last child.

*“Purchased in 2015 due to a suspicion that my BP was high, I'd been to the doctors a few times sporadically and it had always come up a little bit high so I thought …I will actually get a blood pressure monitor”.*

*(M5 age 43)*

*"It had constantly been an issue when I was pregnant 10 years ago, but it had settled down a little bit after that…they told me to keep an eye on it so I bought a blood pressure monitor and then when we moved house 5 years ago…the new GP went 'no this isn't OK and this is how I ended up with the 24 hour thing"*

*(F7 age 39)*

*"I had been on pills for blood pressure for some years before…my blood pressure seemed to be moving around every time I went to the doctor, so she and I got chatting and she said 'you know you could start monitoring you at home if you wanted because they do sell these machines. So, I bought one of the machines and I have taken it at home ever since”.*

*(M10 age 72)*

*“Diagnosed with high BP and doctor recommended monitor BP at home.”*

*(M6 age 79)*

*"Every time I went to the doctors or to the hospital for a check, my blood pressure was all over the place, so they suggested I done my blood pressure at home… Consultant asked me first of all [stroke and carotid surgery]”*

*(F3 age 65-74)*

*"Diagnosed with type 2 diabetes and when they took my blood pressure, they said it was a little bit high…being diabetic, I thought I'll get one just be on the safe side"
(M13 age 52)*

Other participants had started monitoring their blood pressure at home more recently, within the last six months on the advice of their GP because of a recent health event, concern, or new diagnosis of hypertension. Many of these participants had been loaned monitors short term by the practice.

*"I found myself getting more and more stressed and I was also diagnosed as diabetic at the same time…I had two diagnoses at once which was a bit scary…eventually through lockdown I had not looked after myself…I could feel my blood pressure."*

*(F1 age 69)*

*" Only a recent thing, this year - asked to come in for my normal diabetes checks and due a review of me medication and whilst I was there a chap... took my blood pressure and said your blood pressure's a bit high...then they asked me to do the blood pressure at home."*

*(M3 age 60)*

*"Diagnosed with hypertension in March 2023…I decided to buy a monitor just to regularly check…blood pressure skyrockets when I go to GP…I was thinking if I'm able to do it at home…I might get a more accurate score."*

*(M12 age 35)*

*"I've got one at home and I just noticed that my blood pressure was up, so I had an appointment with the doctor. Because of it they took my blood pressure and they found out it was quite high and so they gave a blood pressure monitor for two weeks"
(F2 age 57)*

There were examples where home monitoring had been initiated by other health professionals, including a stroke rehabilitation physio, voluntary health check and consultants in acute care.

*"The physio at my exercise and swimming class noticed that I had …bulging eyeballs…she said I should do a course of blood pressure monitoring to see what was going on… Contacted GP and he arranged a good monitor that could be calibrated"
(M1 age 77)*

*“Voluntary health check at leisure centre [advertised locally] … blood pressure a bit on the high side and my blood sugars were a little bit high…they got in touch with the doctor who called me in for a consultation and more blood pressure checks and he said he thought it was a good idea if I did a blood pressure check over the space of 3 days"
(F5 age 74)*

*"Involved as a patient in a study for heart failure and developing a manual for heart failure which manages your condition at home… I've always taken my blood pressure at home for my own self-management”.*

*(M9 age 65-74)*

A couple of participants had taken the initiative themselves as part of personal drive to actively managing their own health, or out of curiosity by borrowing monitors that were in the home and purchased by other family members including one gifted as a Christmas present.

*“Given to husband for Christmas 10 years ago”.*

*(F2 age 57)*

###

### Experiences of managing blood pressure at home – the process

#### Views about home monitors

Eleven participants had been loaned a monitor by their general practice at some point and of these four had also purchased their own (**Figure 9**).

*Figure 9 – Source for the BP monitor*

A concern for some people was the perceived accuracy of home monitors in comparison with the professionally calibrated monitors in the surgery. A couple of people had deliberately chosen the same brand as those they had seen in the surgery.

*"It gave different readings to my home one…it [home monitor] was giving erroneous results" (M2 age 77)*

*“Not sure if home monitor is as accurate as one GP uses”.*

*(M4 age 44)*

*"I was given one by the surgery…I matched it up. I took mine and I matched theirs and it was the same”.*

*(F2 age 57)*

*“I had to invest in another blood pressure thing because they don't last very long, and they need to be accurate, so I've bought a new one"*

*(M5 age 43)*

*“Purchased 3 blood pressure monitors during my time… I was lent one and what could possibly go wrong? …Well, my blood pressure was off the scale… it was miles out… bought new machine for £40 from Lidl. The only thing with having them at home is obviously they're not serviced and they're only as good as the day and the batteries you put in"*

*(M8 age 68)*

*"I wanted the Omicron one because that's what I've seen in the doctor’s surgeries...when I looked on their website, they say they are the number one brand"*

*(M5 age 43)*

Most of those who had purchased their own monitors did not mention the cost and those who did said they were generally affordable. Some people were sharing monitors with other family members. The cost was mentioned as a consideration by a couple of participants who had loaned GP monitors and would like to purchase their own.

*“Purchased my own when I was prescribed medication…it was like half price, and I thought I'll get one just in case…otherwise I wouldn't have bothered…my partner has had strokes and heart attacks…He uses it more than I do"*

*(F6 age 50)*

*"I already had one at the time, so I said…I'll use my own… the NHS is strapped for cash"*

*(F 3 age 65-74)*

*"Not the cheapest devices...but I can afford it, it's not a problem"*

*(M5 age 43)*

*“Would like to purchase own monitor but can't afford it…on a pension… you have heating, eating and then what's left over is used for things like that”*

*(M2 age 77)*

Participants generally felt that the home monitors were easy to use and saved the inconvenience of having to go into the surgery to be monitored. This was especially appreciated by those who had additional access needs such as mobility, caring responsibilities etc.

*“Easier than going in to use publicly available BP machine… bit of a pain if you've got to go in twice a day for 7 days"*

*(M5 age 43)*

For the participants with learning disabilities, it meant that the care staff knew their preferences and could listen to and respond to individual needs such as any anxiety and which arm to use etc.

*“It causes you quite a lot of stress, doesn't it? When you're not [able to tell the health staff about the need to use a specific arm due to a dialysis stoma] So when you're at home It's a lot easier, isn't it? Because we know [about] stoma… that's another thing with having blood pressure done here… can put them sleeve on himself”
(M22 with Supported Living Manager)*

The other benefit to home monitoring which was mentioned by a few participants was to avoid what they called ‘white coat syndrome’.

*"Saves me having to go to the surgery and have them take my blood pressure with possible white coat syndrome results"*

*(M10 age 72)*

*“The surgery told me I should always ask to take the monitor home because of my white coat syndrome…that's the only way it works for me… I think really, I was a bit scared of it, a l little bit. I mean I've had monitors on me before ...I'm not good at medical stuff...so actually being able to see your own results...so a bit nervous about that"*

*(F1 age 69)*

*"I must have been in my late fifties when my GP suggested that I go on blood pressure tablets…I was working at the time and invariably when I turned up at the GP…last appointment on a Friday night…the first thing they do is strap on the blood pressure...I just came from...in the traffic and my blood pressure was always high...I decided to measure it in different circumstance”*

*(M11 age 72)*

#### Taking blood pressure recordings at home

##### Information and understanding

Many of the participants who had been home monitoring for a long time were confident about what they were doing and had a good level of understanding about the numbers and ranges.

*"I didn't need any extra explanation because I already knew what it was and how to use it" (M2 age 77)*

There seemed to be very limited information given to participants who had been asked to monitor at home more recently. It seemed that monitors were handed out by receptionists or practice nurses with basic, or no, instructions other than how frequently to monitor and given forms to complete. Other than that, they relied upon the instructions that came with the monitors or what they could find on-line.

*“Nurse explained it, gave me a results sheet and another sheet on how to do it … the information was fine”*

*(F2 age 57)*

*“Found the information they gave simple to follow and followed the instructions… fairly simple stuff the spreadsheet they gave me to fill in”*

*(M3 age 60)*

*“No instructions she just gave it to me…no I don't remember her telling me a huge amount. Just go away and do it you know”*

*(F1 age 69)*

Most participants seemed fairly content with this level of information. Where more detailed information and a demonstration had been received, this was valued as it reassured the participant that she was doing it correctly and could therefore rely on the accuracy of the readings.

*"I had to go in with it…so they could show me how to do it properly and make sure I was putting it in the right place …otherwise the readings weren't going to be alright… it took less than 5 mins. But I think because I knew how to use it properly, so my results were more reliable... They gave me the option and ...I said 'no, I'd rather you show me how to do it'… they explained what the numbers were and things like that…they took the time and it was only less than 5 minutes, but it was the time that took to explain these things …that was very helpful.."*

*(F7 age 39)*

The information that some participants were most unsure of was around understanding the blood pressure readings and ranges. There were various speculations shared about the meaning of the readings and what could influence them.

*"Lack of information or understanding that I still have to this day is to how can it be so variable, and should I be worried?... found it very odd there's no guidance on it… It would have been nice at the beginning to understand, is there a long-term benefit to this… I feel I am doing all I can do. I just monitor it in case it fluctuates significantly. That seems to be the only outcome that I should be aware of from what I can gather”*

*(M11 age 72)*

*"What I did notice over the course of that week taking my blood pressure it went down to normal levels, but I do think it's high… I think when you are using the machine, initially you get a sort of spike and then it just tails off because you do things differently, I suppose… I'm not sure, I was quite surprised it spiked quite quickly to be honest ...I don't know what could have put it up… there's probably a spike initially because you are sort of finding your way around the system and that might spike it, I don't know... It's very technical stuff and somebody's done the research and the science is there…”
(M3 age 60)*

*"I've wondered whether …having specific foods the previous night’s dinner would impact, so I even enter those on my spreadsheet…which sounds ridiculous…I haven't found any correlation…the one correlation I'm pretty clear on is the deep breathing before taking my blood pressure" Noticed that the limits need to be lower than used to be "It all seems a bit not arcane, it is I would say over strict"*

*(M10 age 72)*

Other participants seemed quite knowledgeable and talked about the significance of ‘averages’ compared with individual readings. Participants had found information online for example from the NHS and British Hypertension Society websites as well as reading the booklet which came with the monitor.

*"they're kind of up and down, one minute would be perfect, another minute it will be low and then it will be high…so I assume that is why they do an average over two weeks"*

*(F2 age 57)*

*“I know what the level needs to be and when it is unsafe”*

*(F4 age 51)*

*"If I ever forget I can always go to the NHS website because I think sometimes it has some interesting advice… Dr pointed out the top figure and that it rises as you age and gave me a range… Notice BP is low in morning and rises through day"*

*(M4 age 44)*

*"Only because I am quite thorough with my research that I know what is considered high...there is the NHS online where you can punch in your readings, and it will say if it's high or not...I've done that"*

*(F1 age 69)*

##### Monitoring routines

Many participants had difficulty precisely recalling the frequency and duration of the monitoring routines they had been asked to complete by the practice. There were a few participants who had recently undergone the initial monitoring phase or who were still monitoring regularly as part of their medication reviews (3 and 6 monthly or annually).

Eleven participants had been requested by their practice to complete 7-day monitoring and of those 6 participants had also completed an initial 24-hour continuous monitoring first (one area no longer provided access to 24-hour monitoring). One participant was actively completing his initial 7-day monitoring at the time of interviewing. Other participants recalled a range of instructions to monitor for 3 days, 2-4 weeks and up to 2 months continuously. Most people described being asked to record their blood pressure twice a day morning and evening and to take the best of three readings each time.

*"I used to do it every day to start off with, standing and sitting and recently it dwindled and then I didn't do it" (F3 age 65-74)*

##### Continued and current monitoring habits

Sixteen participants were still monitoring their blood pressure at the time of interview (**Figure 10**).

A few participants were very systematic, especially those with other long-term conditions, and were regularly monitoring at the request of their practice as part of regular medication reviews either every 3, 6 months or annually. For example, one 79-year-old participant with type two diabetes had taken readings twice a day continuously for one month every quarter for the last four years and maintained his own spreadsheet.

*Figure 10 – Current status of monitoring BP*

*"I measure my blood pressure let's say every 3 days and just keep an eye on it and I record that as well…for my own benefit"*

*(M4 age 44)*

*"I do it prior to my appointments, diagnostic appointments"*

*(M9 age 65-74)*

 *“At the beginning a month in between …then it went to three months…then it went to six months…and now it's every year”.*

*(F7 age 39)*

Some participants who were more proactively managing their own health were monitoring regularly for their own benefit.

*"She hasn't asked me to take it at home for some years…about 3 years ago when she asked for 3 readings a day or something for a week, which I did. I generally take it on Saturday mornings and Wednesday mornings...I figure that's well enough. It's a good average"*

*(M11 age 72)*

There were a minority of participants who had stopped monitoring their blood pressure at home once they no longer received requests to do so.

*“I wasn't asked to continue recording… nobody asked me to do it or send it in…I’m very naughty"*

*(F3 age 65-74)*

*"Haven't done since doctor told me to stop about 2 months ago"*

*(F2 age 57)*

*"I've taken a couple of tests since then, because they’re not going to test me now for another 6 months”*

*(M2 age 65)*

A couple of others were taking the occasional reading but had stopped regular monitoring.

*"I check it at home when I don't feel right. So, I worry if I have a headache or I'm just really tired for any length of time…that normally triggers something not quite right…I just lost interest and put it in the drawer and didn't look at it again, really unless I needed to"*

*(F6 age 50)*

Commitment to continued and regular monitoring appeared to be influenced by whether participants gained reassurance from regular monitoring or whether they were concerned that it may induce more anxiety.

*"It's been fine at the moment and actually I've had a review about two weeks ago. I've been monitoring it in the past week…they do this yearly now… I should probably monitor it more than I do…unless I have got a review coming up, I don't monitor it every single day of the year. Because I think it would just send me into a panic…I would get obsessive with it"*

*(M12 age 35)

"I've thought about maybe getting one for myself. But the last thing I want to do is introduce more stress on myself by seeing my blood pressure"*

*(F1 age 69)*

#### Logging and submitting readings

Most participants described compliance with submitting readings to the practice when asked to do so. There was only one participant who was on long term monitoring who admitted to not complying recently and she also noted that she hadn’t been chased as a result.

It appeared that the most common method practices used to accept readings was either via paper copies physically handed in to reception or via email. Usually, forms were provided for participants to fill in, especially for the 7-day monitoring or annual reviews.

*"They give you a form and I have to fill it in, and I got a text message saying would you have a review and download this form"*

*(M12 age 35)*

 *“Handed them in and scanned them for my own records”*

*(M5 age 43)*

Several participants were maintaining their own records on spreadsheets, apps, phone devices or on the monitor itself and would sometimes attach copies to emails or along with the practice form.

*"I submit my recordings. I take a month’s recordings. I'm a bit of a geek…I turn it into graphs and then I send it to the GP for my medication review”. (M9 age 65 -74)*

*"They asked me to record it and send the results in to them every week...I was good… I forgot the odd one … I'm only human…they didn't want one initial result either. They wanted all three results to see what times and things like that and it was very specific with the data they wanted which I found quite reassuring...especially as a physicist myself… emailed them through… sometimes take my device with recordings on to annual health check… I just have it on my phone. I'll just whip out my phone and I'll go 'right this one was a bit weird’”*

*(F7 age 39)*

*"I submit a record each time I get a prescription renewal…I have the numbers; they might as well have them because just having them in my computer is not much use to anybody"*

*(M2 age 72)

"There's dozens of them out there keeping all your health metrics...I just found there is a BP journal...and I just transcribe the readings into that… Early on I kind of put them on a spreadsheet every so often… I'll just use it as an escalation trigger”*

*(M11 age 72)*

These participants had easy access to their own readings past and present and were ready to share them when requested for medication reviews and specialist appointments. These were usually people managing other long-term conditions. One participant explained that in addition to emailing his readings to his GP on the form provided, he also attaches his spreadsheet.

*" Yes - when I went down for anything else I always took the results …I take them with me just in case they ask for it. Just in case I have a piece of paper with me, and I can give them to them" (M2 age 65)*

*"When I've sent my blood pressure reading to the practice, I've done that with the spreadsheet… have the records... when surgery ask for 7-day readings I separate them out and send those in”*

*(M4 age 44)*

*"At first I didn't do nothing, but now randomly I'll do them and then I go on my medical record at my doctors and put it on there…. I’ve got an app on my phone called AIRMID… had a medication review at the pharmacy … they took my blood pressure and put it straight on my medical records”*

*(M13 age 52)*

There was some frustration expressed about the lack of online access to upload results directly and the need to copy and write out onto paper forms provided by the practice. Mainly people were using the technology for their own benefit and there was not connection with their medical record.

*"I did offer to submit it electronically to them, but they didn't have a way of doing that…I thought you know I'm entering this into my own APP, why...but they don't seem to do digital at all"*

*(M11 age 72)

"With things going online… I don't see it in the practice at all…I'm still taking in pieces of paper…I still can't access my record and give them any information. I have to send them an email and I get a message that says we’ll look at our emails on Mondays"
(M11 age 72)*

There was only one participant using an APP who could see his online health record automatically update with his readings.

*“AIRMID lets you know they looked at it… so obviously they've seen my blood pressure as well through them and saying nothing… AIRMID APP [shows] that they've seen it. I'm looking at my medical record online on my PC and it don't tell you when they've looked at things" (M13 age 52)*

Also, the two participants with learning disabilities who lived in support accommodation who were part of a remote monitoring scheme set up by their practice using technology provided by [Whzan](https://www.whzan.uk/) Digital Health. The additional benefit of this system was that the data was automatically uploaded to patient records and visible if needed to the primary care team and on one occasion accessible by paramedics enroute to a resident with septic shock.

*“So, we just log on to the [computer]... it's not actually an app, it's you go on you go online ...type in Whzan and then you have log in details so you we log in for each person…they can see all your observations without having to see you… it goes to the nurse, and I don't think it comes up onto their systems unless we then phone and say right, got a concern. Could you have a look and then they will”*

*(M21 age 50 & Supported Living Manager)*

#### Acknowledgement and feedback from the practice

Just over half (13) the participants reported that they usually received an acknowledgement or receipt when they submitted readings to the practice. These receipts appeared to be either from the GP receptionist or generated automatically.

*“They acknowledge receipt and record on my medical record… they send me a form and I fill it in and send it back"*

*(M6 age 79)*

*"I usually send them the spreadsheet as an attachment to an email and I usually get back a reply…I suppose from the reception staff saying this has been received, they're not very lengthy emails"*

*(M4 age 44)*

Others complained that they didn’t receive any acknowledgement that their readings had been received.

*"I've heard nothing from the practice… I'm assuming they've looked at the readings and thought they were ok… I don't know if people even review the information…"
(M3 age 60)*

*"I don't know I mean they did used to fluctuate but nothing was ever said"*

*(F3 age)*

*"I don't know what would happen to the form, I don't know if the GP actually even looks at it …I'm reluctant to give it in, I don't know what they're doing with it" (F6 age 50)*

*"Pretty much the last I've heard of it… rung me once in last 18 months to request I complete blood pressure monitoring form… I checked it at home but never sent it back to them and they haven't checked… They've not followed up to ask where they are or anything...other than 18 months ago. I think so in all those 10 years"*

*(F6 age 50)*

*“At the end of the week… I gave it in at reception and that was the last I heard, the only contact I have really had is with reception… I handed it in on reception and asked for any feedback and the lady said if there's any feedback, they will contact you… I did contact them and say it was high again and the girl said to contact them through whatever the online system is"*

*(M3 age 60)*

*"I've kind of forgotten that they were even interested in my blood pressure…I was surprised that they called out of the blue to say I haven't sent it in for a while and could I send one in… I don't know where that's come from…but it just felt like a …checklist for those people who are on medication”*

*(F6 age 50)*

It was clearly very important to most participants to receive confirmation and reassurance that their readings had been received and looked at by a health professional and uploaded to their medical record. Mainly to provide reassurance, but also out of respect and politeness. This was a key indicator of overall satisfaction with the scheme that participants mentioned

*"She came back to me and said 'yeah that's fine. The readings you got from the home one were erroneous and you have nothing to worry about. But because you have had a stroke you still need to keep a eye on the changes in level’… I'm happy that she is happy"*

*(M1 age 77)*

*"Nothing further officially set up to follow up, they just said to keep an eye on it and stuff and then if I've got any concerns to get in contact with them"*

*(F4 age 51)*

### Impacts and outcomes

#### Diagnosis and medication

Despite perceptions that no feedback had been received in response to submitted readings, it was apparent that the readings had triggered action from the practice. Some participants had been diagnosed with hypertension and prescribed new medications, some had their medication changed and others had been placed on further monitoring regimes.

##### New diagnosis and medication

*"Eventually they put me on some medication for it… [after* further *monitoring] They had to double my medication, so it went from 5 milligrams to 10…* *""
(F1 age 69)*

 *"I didn't get put on medication until 5 years ago when they did the…the new GP health check and they picked it up… I had been told it was within limits…all of a sudden it wasn't … I think they were more cautious than my previous GP… I had a reaction to it ...so much swelling in my legs I couldn't walk ...so went back to the GP "*

*(F7 age 39)

“I had my last child in 2012 and it went up again… it came down again but never to the level it was before. I started getting headaches. My weight never really went back down… had a 40-year check and they put me on blood pressure medicine & statins.”
(F6 age 50)*

Through closer monitoring and management of his blood pressure, one participant with learning disabilities eyesight had improved after many years suffering from Uveitis. In the words of the Care Manager, it has also helped to ‘save his life’ as changes in blood pressure were one of the early signs, they had notice prior to him collapsing with septic shock and they had been able to share his readings in real time with the paramedics enroute.

*“He's got quite poor eyesight as well, and we were in and out of Moorfields Eye Hospital, and I swear it was a lot to do with high blood pressure because since his blood pressure has come down, yeah, he was discharged from Moorfield…It was a godsend to us on the phone to 999. We're able to give them the readings. We were watching his blood pressure dropping but literally, [on the phone to] the paramedics and the 999 operator, ‘Can you check it again for me?’ We were doing it again and we were watching the changes happen… and they're obviously [watching] on the other side... And he actually got taken in with septic shock”
(M22 age 60 with Support Living Manager)*

##### Medication review and changes

*“Told me to change the times I take my blood pressure tablets…she [GP] said it wasn't too bad actually…’since you changed the times you take your blood pressure tablets, they're within limits’ were her exact words. ‘They're acceptable’"*

*(M2 age 65)

"I haven't got high blood pressure, but I take a number of medications that affect my blood pressure…so I monitor my blood pressure because of that… I know immediately if I'm pretty high and… then I contact my GP to talk about it and see if I need to do anything… So I have the ability to know when I'm out of range… It has happened once or twice and that's led to us reviewing my medication… I gave them a month of data and we've decided to reduce ...in consultation with my cardiac consultant...and that seemed to do the trick"*

*(M9 age 65-74)

“I was experiencing side effects and they changed it a couple of years ago…I'm a little bit unhappy that it took them so long to suss out about …the link"*

(M4 age 44)

*“Yeah. Is that something the doctor asked for… it's his renal specialist…Remember why we do it every day…Why are we checking it? Can you remember? What we what are we taking away? If your blood pressure is low, what are we taking away… one of them white tablets… So, we're holding back blood pressure medication. If his blood pressure is below 100. And if both times consecutively, it's below, we withhold the blood pressure medication. I think they will potentially be stopping the blood pressure medication, but obviously this is just to see I think out of a week you've probably only had one or two tablets since you've been home, haven't you because his blood pressure is quite low now?...if we didn't have that, we'd probably have to go to the doctor's every day to get blood pressure checked. And sometimes there's only one member of staff working in the house we wouldn't be able to”*

*(M22 age 60 with Supported Living Manager)*

##### Further monitoring regimes

*“*Three times a day for a week and then four week follow up and then keep a check on it every now and then”

(F4 age 51)

“Every three months once am and once pm continuously for a month and send it off to surgery… for at least four years…GP requested it”

(M6 age 79)

#### Changes to daily life

All the participants were evidently aware of the impact of lifestyle choices on their blood pressure and general health, especially those managing other long term health conditions such as diabetes. Some people reflected upon how circumstances which had impacted on their lifestyle in the past had contributed either directly or indirectly to their current blood pressure health. A few people mentioned the impact of lockdown on their health and wellbeing, for example gaining weight due to lack of outdoor exercise and the stress and anxiety.

*"We just stayed indoors and worked on our computers…underestimated…when you walk to the shops…walk to visit friends down at the park with the kids…you don't really consider that as exercise"*

*(M5 age 43)*

*"I started trying to lose weight again and so on and so forth. It was a bit of success but there was just too much going on and it was too stressful, and I just didn't manage to do what I set out to do…to reverse both things ...* *"
 (F1 age 69)

"Try and stay as fit as I can…it's very difficult… [due to health conditions] Not down to lack of fitness and effort that I've managed to get the high blood pressure…”
(M3 age 60)

"I had a lot of stress through work to be fair and what doesn't help when you've got a lot of work on, you don't tend to do as much exercise as you should and you don't tend to eat as well as you should and the two of them go against you and you put on so much weight...it's very difficult to get down to what you actually should be…still too heavy, but that's cause I have a stressful job and I don't exercise as much as I should…I don't because my joints are …virtually shot"*

*(M8 age 68)*

Talking about lifestyle choices was clearly quite a sensitive topic and most people were keen to promote the efforts they were taking and some expressed disappointment and shame that they had not been able to avoid medication.

*"It stressed me out a little bit because I didn't want to have to take blood pressure tablets to be honest…mum did, and she had a few side effects taking them. So, I didn't really want to have to… So, I put off for a while…”*

*(F2 age 57)*

*“I felt disgusted...I've prided myself on the fact I've had no medication...I've always prided myself on being reasonably healthy...it's hard to accept...but that's where you are. But hopefully I can make a change now"
 (F1 age 69)*

It was evident that some participants felt let down that they had not received sufficient advice and support about how to manage their lifestyle.

*"If I had choice, I would come off the medication altogether and try and work out how to lower that naturally…but they're not really conversations that GPs want to have with you. It's about chucking tablets at you and making it go away so I'll take the tablets"
(F6 age 50)*

*"I'd rather not be on medication, I would like to be looking at some other factors...it's not even an option, it's not a discussion point"*

*(F6 age 50)*

Overall participants did not seem to have been offered any substantive lifestyle advice or support from their practices. The examples they shared appeared ad hoc and subjective, rather than tailored to their individual needs and based on an evidence-based care plan. People relied more upon other sources of information such as the advice of family and friends and what they could find on the internet.

*"The GP would ring me up and say…you need to take extra action and I'll give you another week, you know to sort yourself out…so I felt a bit under threat"*

*(F1 age 69)*

 *"I don't believe they have apart from prescribing the tablets...not that I can recall"*

*(M4 age 44)

"normal sort of chat about what you do and what you don't do…not particularly made lifestyle changes”*

*(F5 age 74)*

*"The nurse I spoke to said you need to lose some weight and I said 'I kinda gathered that, I am trying' and she went do you want any help with that, and I said if there is any advice...I am open to that...and then I never heard anything"*

*(M5 age 43)*

*"All the usual kind of thing we talked about - cholesterol being high as well… healthy lifestyle - that kind of thing was already on the agenda [Diabetic]”*

*(F4 age 51)*

"People tell me once you are on blood pressure tablets you are on them for life, but you know that's not what the nurse said to me, she said you can reverse it if you lose weight”.

(F1 age 69)

Some people who were more confident, health literate and motivated about managing their own health care did not necessarily expect or need this type of support.

*I can very much manage my lifestyle myself. So, I haven't had need for the GP to do that…" (M10 age)*

*"I think I probably got that off the internet looking at healthy lifestyles and stuff rather than the GPs… Done all I can in terms of increasing my exercise and reducing my weight and changing my diet."*

*(M11 age 72)*

*“I work on my mother's principle that you can eat anything you like, but in moderation"
(M1 age 77)

“Even during cancer treatment I was doing 20,000 steps around the ward…I don't believe in sitting down...I'd rather be out doing stuff”.*

*(M3 age 60)*

*"I've kind of done it on my own...I've not really had any support as such I'm the kind of person that likes to do things on my own."*

*(M12 age 35)*

However, there were others who were maybe less confident and, or struggling with other health conditions which meant they needed a more personalised advice and support package to enable them to introduce and maintain positive lifestyle changes. For example, one participant with mobility difficulties waiting for orthopaedic surgery and someone with a hernia that affected what he was able to eat. Others were open about the fact they needed more emotional support as they were dealing with other life situations and stress.

*"I did try to change some lifestyle factors because I know that helps hypertension…I have tried to cut out as much caffeine as possible because that's something actually the GP recommended to me…I definitely think that has helped other things like headaches...dizziness."*

*(M4 age 44)*

*"Because I can't run…I am conscious of my strength slipping away… and I want my life to extend beyond 100 so I am careful what I do…make sure I don't cause myself too much stress, too much blood pressure because I have been there”.*

*(M1 age 77)*

 *"I started trying to lose weight again and so on and so forth. It was a bit of success but there was just too much going on and it was too stressful, and I just didn't manage to do what I set out to do…to reverse both things."
 (F1 age 69)

"Try and stay as fit as I can…it's very difficult" [due to health conditions] Not down to lack of fitness and effort that I've managed to get the high blood pressure…”*

*(M3 age 60)

"I had a lot of stress through work to be fair and what doesn't help when you've got a lot of work on, you don't tend to do as much exercise as you should and you don't tend to eat as well as you should and the two of them go against you and you put on so much weight...it's very difficult to get down to what you actually should be…still too heavy, but that's cause I have a stressful job and I don't exercise as much as I should…I don't because my joints are …virtually shot"*

*(M8 age 68)*

Stress was mentioned by many participants and there was a high level of awareness of the impact of this on their blood pressure. It seemed that home monitoring was a tool that was helping them to keep track and manage their levels of stress.

*"I've tried being kind to myself and when I'm tired, I just say right I'm having a day off and I'm not going to do anything today."*

*(F1 age 69)*

There were a couple of positive examples where people had received the support that they needed and been able to implement some positive changes, such as one participant who had lost over 4 stone and was now more able to exercise regularly. She very much valued the additional support she had received from an NHS health coach at Southend Health Hub who had been able to signpost her to other providers such as Slimming World and a cycling exercise group.

*“I got referred to a health coach … I've now lost 4 stone in over a year Initially saw health coach one a month for six months "he can refer me to all sorts of different things and he referred me to Slimming World....I did it for a little while ...now I do it on my own... found exercise I enjoy… it's a charity and they have loads and loads of different adapted bikes and trikes and you basically go around the circuit...after that I bought a bike and ...that's what I was just doing ...I went on a bike ride which I wouldn't have done this time last year and it's because of the programme and everything that's happened… I've committed to changing things, you know lifelong habits”.*

*(F7 age 39)*

*"I'm getting my life together...I'm much more on an even keel now and I think I will really be able to sort out the diabetes and the overweight and my blood pressure…I can see the fruits of what I have been doing now coming out...I'm starting to work again**"
(F1 age 69)*

*“I suppose they kind of know me and that I go walking with the dog and have a kind of idea of my lifestyle… fortunate it's a very good surgery…and I think when you feel supported, and the doctors know what you what's going on… small village practice…people tend to know each other”*

*(F4 age 51)*

For both participants with learning disabilities blood pressure monitoring played a role in them being able to lose a lot of weight and consequently be more independent in their self-care and be more physically active. They had clearly received a lot of support from the care staff; however, they were also very proud of themselves.

*“When you first moved in, can you remember how much you nearly weighed nearly 22 stone, wasn't it? And what were you today when you weighed… I think it was 14,11 or 14,12 [stone]… we are proud of him, and you are proud of yourself. You should do you’re amazing…your family say you’ve got your spark back... when you first move in you couldn’t get yourself dressed… we just leave you to get dressed now don’t we... It’s [blood pressure] definitely lower than it was…it’s definitely come down a lot”
(M21 age 50 and Supported Living Manager)*

There was general agreement that more tailored lifestyle advice and support was needed.

*"I need to lose weight...Had a really hard time trying to lose weight"/ "I'm really trying…I just find it really hard…I think I'm doing something wrong… It's quite infuriating to be honest… I was kinda hoping I could lose some weight and try and make a meaningful change to my blood pressure”.*

*(M5 age 43)*

*"there's no incentive to do anything differently...because there is nobody there encouraging or making sure you are doing the right thing, no support."*

*(F6 age 50)*

*"life coaches that kind of thing…somebody you could talk through lifestyle options with that potentially might be impacting blood pressure that you could change independently and then review before they put you on medication… with 6 month reviews… now let's get you reviewed see what other options there are...but just to say your blood pressure has gone up, to put you on medication and then never review...it's not personally how I would like to maintain it"*

*(F6 age 50)*

*“You know when you are put on the blood pressure tablets it was a done deal...but there's no like 'take some exercise and have 5 a day...you know the practical advice that went with it" (M11 age 72)*

####

#### Medicine acceptance and compliance

As mentioned, there is often disappointment and reluctance expressed about being prescribed blood pressure medication. However, for some participants it was a relief to be diagnosed and to notice through home monitoring the impact of the medication on their numbers and in managing their symptoms.

*"Relieved actually because it explained a lot of things that have been happening...cause they said ...'you know not many (people) see sparkles', I was like ‘what? is that not normal?...I've been like that all my life and as soon as I started taking the medication it stopped...a revelation to be honest with you, so actually I was quite relieved that I wasn't just a little be crazy seeing things, that actually it was a medical cause"*

*(F7 age 39)*

*“It was very beneficial. I felt like it was helping to try and resolve what my issues were...you could see there was an improvement from the first set of drugs and could see significant improvement when they upped the dosage… Accepting where I was and then me accepting that I needed to take more medication"
(F1 age 69)*

*"I don't mind…when I first went on the medication, I wasn't particularly happy about it because it's something you have to be on for life… But now I'm a lot more used to it… It keeps my heart healthy and it's just a tablet a day”.*

*(M13 age 35)*

#### Building knowledge and confidence about managing own health

Participants shared a range of different attitudes, behaviours, and beliefs about how they manage their own health as well as different motivations. Some people appeared to have a more passive and pragmatic approach and were more willing to accept the decisions of health professionals. Whilst others were more proactive and questioning and keen to be more actively involved in decision making.

*"I feel ok in myself…it was just a precaution …I am a very optimistic person, plus I have run all my life and I tend to self-monitor the way you feel. That sounds a bit pretentious, but it is just what happens”.*

*(M1 age 77)*

*"I've always been a determined character physically and mentally …the army helped me through that…I don't suppose there's many people that have been through what I've been through that are still here…All these things add up stress, cancer, diabetes, high blood pressure, high cholesterol and then I suppose age as well...put all those things together and I suppose I'm no different to anyone else, your body just reacts"
(M3 age 60)*

*"I guess it's like a curiosity… They [family] give me the impetus to look after myself, to be there for them… I'm always the person if something is wrong, I try to get to the bottom of it and do the right things and I worry about other people who haven't got that sort of know how" (M7 age 72)*

*"I try and make informed decisions where possible… I have a rudimentary knowledge and I'm quite happy to go and do my own research…I like to try and make myself familiar and just try and look after myself even though I'm not doing a very good job of it… Got to deal with day-to-day life...constantly trying to make sure you have enough money to electric on and stuff like that...always just under surface”.*

*(M5 age 43)*

There was some indication that taking blood pressure at home contributed to empowering individuals to be more pro-active and confident about monitoring and/or managing their own health and increasing their health literacy.

*"I understood a bit better"* (F1 age 69)

 *"I definitely feel a lot better…I want to reduce my medication...my target is to lose enough weight so that I can... I have thought about getting myself one at home so I can just check it…So I feel much more in control"* (F1 age 69)

*"It has changed my life in that respect because I wouldn't have done this [Zoom interview] ... I wouldn't have had the confidence to sit on here on a camera and do this"*

*(F7 age 39)*

*"It tends to develop a better sense of self management for the patient. It kind of reduces health inequalities because everybody has an opportunity to manage that condition. It provides personalised and timely care…and it makes better use of health care staff I guess… It helps me better understand my condition and gives me a sense of control and choices about my condition… I find a huge benefit ...it makes me more aware...it gives me choice and control...and it helps me to share the decisions… for some of the more diverse communities we can give them the ability and the tools to ... take responsibility to manage their own care... it will be a huge benefit to them and ...less of a burden to primary care"
(M9 age 65-74)*

*"Just pretty much left to me own devices for a lot of it to be honest and it does give me a little bit of cause for concern…but I'm not overly concerned because where I can kind of read my blood pressure…and I've got a little bit of understanding… I don't need them to babysit me...but if they could point me in the right direction...there's a lot of dodgy stuff online and it takes time and effort out of my day”.*

*(M5 age 43)*

The supported living care staff were extremely proud to share how they had learned to recognise warning signs through the regular monitoring they were facilitating for their residents. Talking with the residents it was also evident that they were involved in the process and understood to a degree the importance of blood pressure monitoring for their own health and wellbeing.

*“that's something that we've learned to pick up on is when it when it gets low … We've learned a lot from the doctors, the nurses at the hospitals and what we need to look out for. So yeah, it's definitely been good for us”
(Supported Living Manager)*

#### Rapport with NHS

Nearly everyone referred to an NHS ‘under pressure’ and the difficulties this was causing with accessing appointments and primary care services. Covid was seen to have worsened this and participants described how their practices were still operating under restrictions introduced during the pandemic such as: telephone triage appointments, lack of face-to-face appointments, and even suspended access to previous GP online services.

*"To be honest you can't get an appointment at my practice, and I haven't really followed it up which is my fault really… I also understand they are very busy; the practice is absolutely chocker so for me it's not down to the people in the practice. It's the resourcing and unless you're banging on the door saying there's something wrong then you just get picked up on the usual reviews, I suppose…the receptionists they've got a lot of people giving them a hard time and I know from the local social media ...that people aren't happy with the practice… GP practice has gone downhill, since COVID things have changed significantly… the NHS is in crisis"*

*(M3 age 60)*

*"I've not spoken to an actual doctor in many years…it's only been a nurse practitioner and normally to be fair that was a couple of years agon and that was over the phone…I haven't been into the surgery since 2017"*

*(M5 age 43)*

*“So busy can't get appointments - when I phoned, I was 22nd in queue… that's happening everywhere isn't it”*

*(M2 age 65)*

*“no one has seen me at doctors… our GP won't see anyone… we are allowed a triage call with the nurse who then decides whether or not we see a doctor and invariably we don’t”.*

*(F6 age 50)*

*"Trying to get to talk to the GP since Covid has been difficult to say the least" it's a joke "It's a filter…it just stops people accessing the service on a stuck queue on their phone”.*

*(M11 age 72)*

Despite this some participants were still grateful to the staff and recognised that they were trying their best. There were some examples of really high levels of rapport with practice staff, mainly from participants who had been with the same practice for many years.

*"I'd dissolve into tears because there was just so much shit going on and they were great in that respect, and I felt looked after and I felt heard"
(F1 age 69)*

There was evidence that participants were accessing other health providers and sharing their blood pressure readings with them. Pharmacists were often mentioned in relation to medication reviews and participants had asked them for advice about their readings.

*“haven't seen GP for 3 years - impossible to get an appointment… I've seen other specialists that work just as well…like a pharmacy, or a ... prescriber, or the annual review hasn't necessarily been done by the GP in the last 3 years it's been done with a nurse”.*

*(M9 age 65-74)*

In the case of the supported living care staff the remote monitoring had enabled them to have easier access to the advice of the GP on behalf of their residents and a more informal and regular dialogue. They felt able to raise questions and share blood pressure results in a way that they hadn’t been able to before due to the difficulties of accessing appointments and awareness of not making unnecessary requests and overloading the system.

### Satisfaction with blood pressure at home scheme

There was extremely low awareness or recognition from participants that they were part of the BP@Home scheme, despite having completed a survey and volunteering for the interviews. Participants measured their satisfaction mainly in the context of how they felt about using home blood pressure monitors and the associated support they received from the practice, along with their blood pressure health outcomes.

The main reason given for low satisfaction was the lack of acknowledgement or feedback to submitted readings.

*"Even a text saying thank you very much we have received your latest blood pressure results…something like that. You know, something simple… At least you know, they're looking and receiving my things. They've received the results… Minus 10…well no communication. They don't communicate with you...even a little text saying thank you for your blood pressure results...that'd be nice...or reassurance you are doing the right thing" (M13 age 52)*

*“Be nice to know what they do with the information… do they study it…what influence does it have" (M4 age 44)*

Also, the lack of holistic advice and support with managing relevant lifestyle and wellbeing needs and challenges. Most did not describe a personalised blood pressure management plan with goals or signposting to other healthy living providers. They often referred to the process as a ‘tick box’ exercise.

*"That's why I filled in the survey…I feel quite depressed about… the whole process…it seems to be a crisis service…rather than a planning or care service…It's like somebody has asked you to do something and they're ticking a box”.*

*(M11 age 72)*

*"I didn't mind doing it, it's for your own benefit isn't it. What I was surprised is there's been no feedback positive or negative...that's the difference. I like to think that if I do something for people then I always give them feedback one way or another whether it is positive or negative… I'd have one permanently if I felt I was going to get feedback...if I'm just filling out a form and no one's looking at it then I'd say that's a bit of a waste of time. But if somebody is going to look at it and give me positive or negative feedback and give me advice and I can act on it then I'm well up for it...but to be honest with you, I was a little bit disappointed that nobody's come back to me and said, 'are you alright' or 'can we do this again in 3 months'" (M3 age 60)*

*"1 out of 10 the support that I've got - a 3 if I'm generous…little bit more info…I've been looking online and apparently you can submit your readings through this online form…I don't know anything about this because they never told me… They said you need to do your readings and look out for a high reading...it was only through me doing my own research about what are good and bad readings otherwise I'm not being funny how would I know what is a good or bad reading...I am not a clinical professional…”*

*(M5 age 43)*

*"They don't seem to be interested in my blood pressure…I'm just wondering when they're going to next contact me to record my blood pressure again…I'm not sure when they're going to follow up…so maybe they've got the information they need…I'm not entirely sure ...it would be useful for them to say to me...what they need from me, or what they think about my blood pressure"*

*(M4 age 44)*

A couple of participants were honest in admitting that their lack of satisfaction is what motivated them to take part in the evaluation so that they could feedback.

*"Talking about it irritates me a bit...when I got your email...I'd forgotten I was even supposed to be doing my blood pressure at home or that anybody cared that I was doing my blood pressure at home... Intention of BP@Home is good, but only going to work if you have the care and attention ... People that ask you to do it and make sure they're following up; it doesn't take very long… There's a difference between reviewing your own blood pressure and somebody having a welfare check to see what the issue is...there isn't any of that. It's down to me to interpret my own results… In order to be successful, it needs to have follow up and encouragement. No one's ever checked that I know how to use the blood pressure monitor myself...it doesn't feel like there is any genuine intent to make sure it's a success. It's at tick box exercise mainly”.*

*(F6 age 50)*

*"That's why I filled in the survey…I feel quite depressed about the whole service, the whole process…it seems to be a crisis service…rather than a planning or care service " "It's like somebody has asked you to do something and they're ticking a box and that seems to be it" (M11 age 72)*

Most people said in principle it is a very good idea to monitor blood pressure regularly at home to ‘keep an eye’ for any changes and provide ‘reassurance’. Some referred to feeling ‘safer’ and others said that they had gained knowledge and awareness to enable them to notice when to seek medical intervention. Participants were also conscious that it relieved pressure on primary care with them needing less appointments and visits to the surgery. And nearly everyone found that taking their own blood pressure at home was easy and convenient.

*"It's a good scheme...I think it's right that people should have blood pressure tests to be able to take them home for a period of time…”*

*(F1 age 69)*

*"I feel safer I suppose… it’s a good idea… it keeps an eye on you all the time…It makes you feel better…you feel more relaxed."*

*(M2 age 65)*

*"I thought it was a good experience…I would give it a 9 or 10…it makes you aware of you know looking after your own life, your own personal self…if you need to make some changes… For …older people having their blood pressure checked a bit more regularly probably is a very good idea"*

*(F5 age 74)*

*"it's no hardship and it's a failsafe isn't it…providing you treat the machine with respect, and you know you have faith in it" "if it saves pestering the old boy the doctor, cause at 8 o'clock in the morning it's just a scramble...and you're 61st in the queue”.*

*(M8 age 68)*

*"I think it's enormously useful. I think it's extremely beneficial for people to take their own blood pressure so long as it doesn't frighten them and to get tonnes of understanding of what drives it…it gives them a better view of their overall health”.*

*(M10 age 72)*

*"I would like to lose enough weight to reduce the medication...I was pretty much told that you are going to be on this pretty much for life and once you’re on them it is very difficult to get off them...it would be nice to reduce it, that's my goal ultimately...to reduce the medication and show my daughter...mirror good habits" Self-blame for getting in this position "I'm trying to change what happened in my life when I was younger so it doesn't happen to her"*

*(F7 age 39)*

*"It's absolutely fine, I wondered why there would be any questions on it. It suited me down to the ground really”.*

*(F2 age 57)*

The supported living Care Manager was very keen to share the positive difference that home monitoring had both for the residents and in enabling for them to provide better and safer care. She described how they had been able to detect early signs of infection and even septic shock, through the knowledge they had gained about reading and understanding changes in readings.

*“You know when it could just be that, you know, there could be an infection… suffers with cellulitis. so it could be that he's got an infection. But then looking at the blood pressure being low, the pulse being high, all of that together… And we've all learned so much. It's we've just, you know, we've learned how to look out for infections… We've learned, you know, cause we know now that blood pressure drops. We know that pulse rises. We know that you know all the different symptoms… I think it's definitely helped. It's helped my whole team to know that we can look after these guys a lot better”
(Supported Living Manager)*

Another key benefit is it reduced the number of visits they must make to the surgery which has been better for everyone especially the residents as they are more comfortable in a home environment. It also freed up capacity for the care staff who were needed to chaperone residents and the staff at the practice.

*“It's helped us in a massive way, and it does save time sitting an hour trying to get through to a doctor…then trying to fight for an appointment, then having to sit in the waiting room and take the spaces up… You may not need to go, it can be done over the phone, which saves [M21] the stress of having to go and sit in the doctor's surgery, having to see a stranger cause it's not always the same doctor”.*

*(M21 age 50 with Supported Living Manager)*

Although, there was also a reminder from one participant about the value of the human connection with face-to-face appointments and not relying totally upon remote monitoring.

*"Apart from my annual review I've not really had much else support or advice form the GP around it…If I'm honest now they've had a letter from the cardiologist to say they need to keep a closer eye on my blood pressure I've heard more from them in the last few weeks… Seeing them more in surgery would be helpful. I think a lot of the time I've had a review it's been over the phone and that's fine...but sometimes it does feel like they are rushing through it, or they just need to tick a box and get you off… When I went into the surgery...it felt a lot more time to speak to the doctor and I could ask questions… It feels easy...I can take my blood pressure in the surgery so they can check it themselves...I think it's a little bit more personable”.*

*(M12 age 35)*

One participant who was especially keen to participate and feedback, summarised very articulately improvements that he would like to see with the scheme.

*“It feels transactional and I’m looking for a service...something that helps me plan my life. And what I seem to be getting is reaction to a crisis… If they'd got me at 45, 46 you know I might have avoided the fib [atrial fibrillation] and in I'm not totally convinced the fib wasn't partly a consequence of the drugs… There's a lack of outcomes ...why couldn't somebody do more when I started taking the drugs and give me the prospect of what to do that would improve without more drugs, you know the last thing I want… They must have had the same people on those drugs for years and years...but no one's ever asked them. Nobody ever asked me what were the side effects… The GPs I think are in a unique position that people trust them, and the health service is in a unique position...it'd be a good place to get...a plan or programme...I don't mean like a local authority 35 page, 3 days to fill in plan. It could be a good place to tick a box and see which ones you want to do; you know pick and choose...a menu driven thing you could have for different conditions...which lifestyle changes am I willing to change and how am I going to measure it… there are no goals...instructions. You get a different opinion every time… It's a contract...this is what we want from you to improve the situation...or this situation isn't going to improve...what do you need to make that happen… I understand the pressures…but I think it’s incumbent upon the patients to go figure out how to look after themselves better...if there was some kind of minimum guidance...what the prospects are, what the escalation would be...what signs to look for when it did escalate what and how to react...simple stuff that you just put on the side of your fridge and look it up if something happens… It's easy to give people drugs, it's much harder to change their behaviours… Set them a goal, give them a plan...ask if they are willing to be held accountable themselves for doing it. Because it's not for the GP to do it. It's up to us to change our lifestyles… a lack of nutritional advice and a huge range of conflicting nutritional advice”.*

*(M11 age 72)*

## Limitations

The non-probabilistic sample for the online survey may have introduce important bias (e.g. only people engaged with the use of the BP monitor at home may have decided to take part to the study; age bias; only digital skilled respondents). This affects the generalizability of the results presented in this report.

* The nature and size of the associations identified in this analysis should not be used for prediction. Results could be used to inform potential changes in the programme but the uncertainty behind the results should be taken into consideration.
* A very small number of participants received their BP monitor from their GP limiting the possibility to understand the implications of providing the population with a free BP monitor.
* It was clear that some participants were not identified by their GP as needing to monitor their BP at home and therefore agreed with their clinical staff to participate in the BP@Home scheme, but rather were monitoring their BP for alternative reasons, such as long-term monitoring or deciding for themselves to monitor. Although still informative it should be noted that not all participants may have been part of the BP@Home scheme, however, have all experienced monitoring their blood pressure at home.

## Discussion and recommendations

* The utilization of home blood pressure monitors has a profound impact on users, as it engenders feelings of empowerment, safety, and motivation for the majority of individuals. These emotional responses hold significant implications for individual health, potentially leading to improvements in the overall health profile of the population. Moreover, the use of these monitors can foster a positive relationship between patients and healthcare providers, including GPs and medical services, ultimately contributing to a reduction in the burden of care.
* By empowering individuals to actively participate in their health management, home blood pressure monitoring enables users to take ownership of their well-being. The sense of safety derived from being able to monitor blood pressure regularly and independently promotes proactive healthcare behaviours and better self-awareness. Feeling motivated to monitor their blood pressure can encourage users to maintain a consistent monitoring routine, leading to earlier detection of any fluctuations or anomalies. Yet results from the survey suggest that participants had less confidence in behavioural changes and diseases monitoring, suggesting space for further interventions.
* Furthermore, home blood pressure monitoring fosters a closer patient-provider relationship. Patients who actively monitor their blood pressure may be more engaged in their healthcare journey, leading to more informed discussions and decision-making during medical appointments. This collaborative approach can enhance patient satisfaction and lead to better health outcomes.
* Results showed that 24% of the 96 participants who began monitoring their blood pressure at the request of their GP did not receive a follow-up contact. Ensuring a structured plan or protocol for follow-up after requesting blood pressure monitoring from a GP or health professional is essential. Such a plan is vital to maximise the benefits of home blood pressure monitoring for both individuals and the healthcare system as a whole.
* A considerable number of the participants (n=91) expressed positive feelings such as empowerment and motivation associated with having a BP monitor at home and measuring their blood pressure. However, when asked about receiving advice on what to do in case of too high or too low readings, less than forty percent of respondents answered positively. To maximise the benefits of home blood pressure monitoring, it is crucial to provide users with relevant information, including clear guidelines on how to respond when readings are outside the normal range. A smaller number of participants were unclear about how the submitted readings were to be used, suggesting a potential area for improvement in the instructions or communication about the utilization of the blood pressure data.
* The sample of respondents showed a high level of confidence in using apps and online forms of communication with (84%). While it is important to note that this sample is self-selected and may not represent the general population of users, it provides valuable insights into leveraging existing digital skills to enhance home blood pressure monitoring programs or any other type of remote monitoring programme beyond blood pressure. Additionally, it offers an idea of the potential level of engagement that can be achieved through increased access to technology, while also addressing the issue of digital exclusion in the population.
* The findings suggest that there might be certain factors influencing the adherence to submitting readings that cut across the length of time users have had the BP monitor. It is essential to identify these factors to improve compliance and ensure consistent monitoring.

Based on the analysis of both the quantitative and qualitative data a series of recommendations are presented, some of which reflect ideas put forward by the participants while others are based upon observations which emerged during the analysis.

1. **Public engagement and communications** – raise awareness of the scheme and provide case stories and contact details for further general information.
2. **Patient information** – standardised and accessible information for patients new to the scheme including, literature/leaflets and guidance for practice staff (reception/nursing/GP) to ensure consistency of messages and guidelines.
3. **Systematic and automated requests and responses** – to ensure patients always receive at minimum a receipt and thank you when they submit readings to the practice. Automated reminders for patients who require regular monitoring e.g., medication reviews. Where this is not possible, patients should be informed they will not be contacted regarding their readings unless further investigation is required, so they are informed.
4. **Greater use of digital health**, including apps and remote monitoring directly linked to patient records e.g., Whzan to maximise and encourage patients to actively record and monitor their own health data.
5. **Personalised lifestyle information, advice, support and signposting** to relevant support and providers (NHS and third sector etc). Including resources to enable BP prevention and management goal setting and monitoring. Enable patients to become more active participants and able to take shared responsibility for their health, adopting a personalised care approach, using joint decision making when looking at medication options.
6. **Coordinated health/medication reviews** with other long-term conditions and health providers including acute care specialists and NHS health checks etc.
7. **Keep listening and feeding back to service users** – participants were grateful and keen to take part and receive feedback on any outcomes generated.
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