eHealth-monitor

Medical specialists

general practitioners

Nurses in elderly care

Self-management and telemonitoring

Theme discussion 3
eHealth-monitor 2019

This theme discussion is part of the report *eHealth-monitor 2019*. It describes the use of and experiences with IT applications with regard to illness and health that can be used by healthcare users themselves in their own environment. The most important findings and possible follow-up steps are listed at the start of this theme discussion. This is followed by a more detailed description of the research results. The text refers to tables that are provided in the *tables annex*.

Report eHealth-monitor 2019
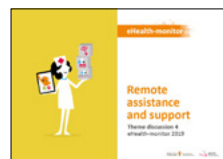
Tables Annex eHealth-monitor 2019

See also the other online theme discussions:

Necessity and added value
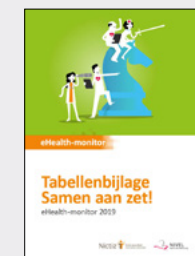
Online access and contact

Remote assistance and support

Electronic data exchange and communication between healthcare providers

Self-management and telemonitoring

eHealth contributes significantly to the self-management of healthcare users. Self-management is defined as: coping with the condition, the social consequences and the necessary lifestyle adjustments in such a way that the condition interferes as little as possible with daily life.

Self-management means that healthcare users determine the extent to which they want to remain in control of their own lives and that they have input in the decisions involving their healthcare. The healthcare providers base the healthcare on the wishes, needs and capabilities of the healthcare users, wherever possible.

IT applications such as apps and telemonitoring allow healthcare users to check, track and share their health values (such as heart rate and weight), lifestyle data (such as diet and exercise) and healthcare (such as doctor's visits and treatments). It also enables healthcare users to learn more about their disease or treatment[1-3].

Discussion of the most important findings

The objectives of self-monitoring and data monitoring

In 2014, the eHealth-monitor started monitoring the objectives of then-Minister of Health, Welfare and Sport (VWS) , Edith Schippers. This eHealth-monitor focuses specifically on the realisation of these three objectives. One of the objectives concerns self-monitoring and data monitoring (**Box 3.1**).

Box 3.1 Objective of self-monitoring and data monitoring

"In 2019, 75 percent of the people with a chronic condition and vulnerable elderly – who are willing and able – will be able to check their health values independently, often in combination with remote data monitoring performed by a healthcare provider. This enables them to monitor the progress of their condition, and the regular feedback helps them gain insight into the effect of their behaviour on their condition. This will make therapy compliance easier and more appealing ".[4]

This objective has been achieved

In 2019, the objective concerning the self-monitoring of health values by people with a chronic condition who are willing and able to do so was achieved. Another finding was that healthcare users monitor their health data more often than in previous years via digital means such as websites, apps and telemonitoring. Self-monitoring health values makes it easier for people to check whether their measured values are still within certain limits. This is confirmed by more than three quarter of the people with a chronic condition who monitor their health values. Almost a third also feel that measuring health values gives them a better understanding of the effect of their behaviour on their health. Other studies have shown that patients are reassured by the feedback they receive on their measured values via the ICT applications[5].

Only eight percent of the people with a chronic condition who measure their health values send the data to their healthcare providers via electronic means. Six percent indicate that their healthcare provider monitors the health values remotely and contacts them if something is wrong.
In addition to data monitoring, websites and apps

with reliable information can also help patients gain more insight into their health. These types of websites, such as Thuisarts.nl, can contribute to the self-sufficiency of patients. For example, these websites can be used to answer minor medical questions, which in turn may prevent 'unnecessary healthcare' (see also Theme Discussion *Online access and contact*).

Motivation for self-monitoring

Even though the objective has been achieved, almost four out of ten people with a chronic condition indicate that they're not interested in monitoring their own health values. This is why it is important to gain a better understanding of the usefulness and added value of self-monitoring health values and which factors play a part in this context. A study among COPD patients has shown that there are various aspects that affect (the use of IT applications for) the monitoring of health values. Contributing factors are: experiencing the added value of an ICT application, the level of digital competence and self-confidence, the subjective experience of the condition, personal instruction and education, and the influence of the social environment[6]. A survey of patients with heart failure

found similar factors[7] (**Box 3.2**). This is why it is important for eHealth developers to get input from end users during the design process for healthcare applications and to think about the place of the app in the healthcare process, so the app contributes to the quality of the care [8, 9].

Box 3.2 Experiences with apps and telemonitoring in heart failure[7]

In 2019 the patient association Harteraad and the Dutch Heart Foundation conducted an inventory study of the use of apps and telemonitoring among 136 patients with heart failure. This study revealed that one third of the heart failure patients use apps to comply with the treatment. These are apps for exercise, heart rate, diet, weight and medications. Less than 10 percent of the patients use telemonitoring to check for signs of heart failure. When asked where they prefer to have their check-ups (hospital, general practitioner, telemonitoring), 70 percent of the patients responded that they want to go to the hospital for check-ups.

One fifth of the doctors use telemonitoring in their organisation

Approximately one fifth of the general practitioners and of the medical specialists indicate that telemonitoring is used in their organisations. Among medical specialists this number has grown compared to previous years. Four out of ten people with a chronic condition think telemonitoring will be convenient for them.

Healthcare providers see the added value of telemonitoring if it promotes the self-sufficiency of patients, but they think telemonitoring is suitable for only part of the patient population. The successful implementation of telemonitoring depends on selecting the right patient group(s)[10].

Scaling up self-monitoring and data monitoring

In order to promote self-monitoring of health values by means of apps and promote the use of telemonitoring, healthcare providers and healthcare users must understand which eHealth application is relevant and feasible for which target group, in which context/which place in the healthcare process, and the frequency with which this should be combined with regular office consultations. This needs to be set out in guidelines, quality documents and the (continued) professional development of healthcare providers[9]. If telemonitoring is used by the right target group and if telemonitoring is embedded properly in healthcare, it can reduce the use of healthcare services (**Box 3.3**).

People for whom self-monitoring and/or telemonitoring is relevant can be encouraged further to take advantage of these options. Healthcare providers can play a part in this process for patients they are already seeing. The rest of the target group can be reached via government campaigns. To promote scaling up, it makes sense for healthcare providers to make (regional) agreements with one another regarding the practical coordination of (digital) healthcare. Who will offer practical assistance, who will receive the data and who will respond to the data? Informal caregivers can also play a part (if possible) in terms of assistance with using the technology and monitoring the data for vulnerable elderly patients living at home. And finally, patients need to be educated and shown how to use the telemonitoring applications, so they know in what urgent situations they need to contact the doctor or nurse. Nurses can play a part in this, as they suggested themselves in the 2018 eHealth-monitor 2018[11].

Possible follow-up steps

- Create quality documents that specify which patients would benefit from (tele)monitoring, and in which situations and with which frequency the data are monitored.

- Make (regional) agreements about the coordination of the telemonitoring process, which healthcare providers should be involved, and who is responsible for what.

- Create reliable websites and apps with information about lifestyle, disease and treatment that is easier to find and more accessible.

Box 3.3 Examples of self-monitoring and data monitoring

Recent pilot studies have shown that the use of certain self-management and telemonitoring applications appears to lead to a decrease in healthcare use. A few examples are:

- HartWacht[10] (telemonitoring for patients with resistant hypertension, heart failure and arrhythmias based on measurements (weight, blood pressure, etc.) and questionnaires that are filled in by the patients at home);

- EmmaCOPD[12] (personal health environment (PHE) for COPD patients with a smartwatch for continual feedback on activity and sleeping patterns);

- MijnIBDcoach[13] (an interactive self-management application which teaches patients with chronic inflammatory bowel disease about their illness. The app offers users a simple way to communicate with their treatment provider. The treatment provider follows the patient remotely).

- In 2019 the experiences and ambitions of five Dutch hospitals that are at the forefront of telemonitoring were studied and described in a report[14].

Less than half of the healthcare users monitor their own health values

Four out of ten healthcare users and four out of ten people with a chronic condition measure their own healthcare values such as weight, blood pressure or blood sugar level. About 15 percent indicate that they don't measure their health values but that they are willing and able to do so. More than 30 percent are not interested in measuring their health values. A notable finding is that there was not much difference between healthcare users and people with a chronic condition in terms of (an interest in) measuring health values (**Figure 3.1**).

During the past few years more healthcare users have started to keep track of their health via websites or with smartphones, tablets or other devices. In 2019 this was done by approximately one third of the healthcare users (**Figure 3.2**).

Self-monitoring leads to improved management of health values

More than three quarter of the healthcare users and of the people with a chronic condition indicate that monitoring their health values makes it easier for them to check whether their measured values are staying within certain limits (**Figure 3.3**). However, a smaller percentage – 38 percent of the healthcare users and 26 percent of the people with a chronic

Figure 3.1

Healthcare users and people with a chronic condition
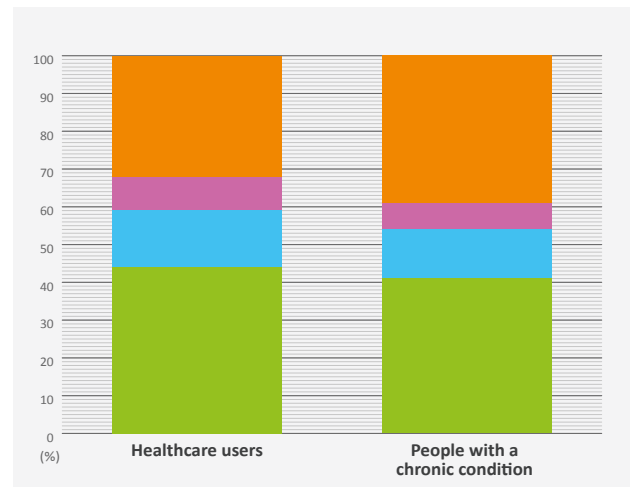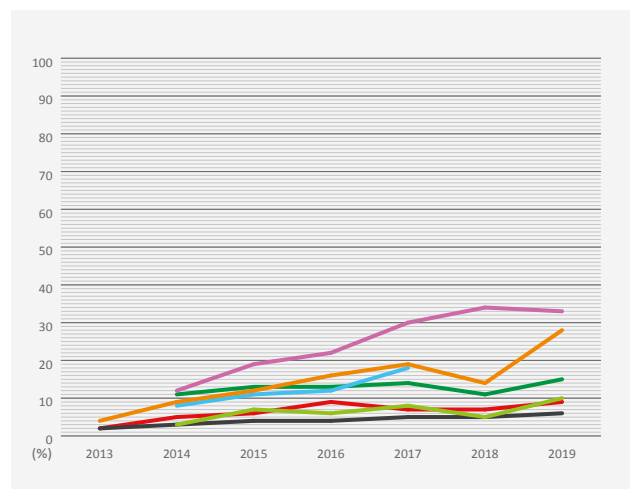Percentage monitoring health values such as weight, blood pressure or blood sugar; in 2019.

Legend:
- Yes
- No, but I want to and I can do this myself
- No, I want to but I can't do this myself
- No, and I don't want to do this myself

Figure 3.2

Healthcare users
Percentage hkeeping track of information about health and healthcare via a website or with a phone or other device;
in 2013-2019.
*** p ≤ 0.001

Legend:
- Use of automatic reminders on my phone to take medications ***
- Use of a device that regularly measures health values (such as blood pressure or blood sugar values) and sends them to my healthcare provider or the hospital***
- Measure my own health values (such as weight or blood pressure) and keep track of these values via the internet or with an app on my phone or tablet
- Keep track of my own data regarding doctor's visits and/or treatments via the internet or with an app on my phone or tablet***
- A device or mobile app that keeps track of my physical activity, like a step counter during exercise for example***
- Keep track of my own data regarding nutrition and/or diet via the internet or with an app on my phone or tablet***
- Keep track of my own health data via the internet or with an app on my phone or tablet***

condition – feels that monitoring their health values gives them more insight into the effect of their behaviour on their health. In addition, healthcare users and people with a chronic condition indicate that they don't monitor their health values if they don't feel it's necessary (29 and 40 percent) or because their healthcare provider is already monitoring their health values (26 and 38 percent) (Tables 3.17-3.19).

Telemonitoring is done by a limited group of patients

Of the people with a chronic condition who monitor their health values, eight percent indicate that they send their monitoring results electronically to their healthcare providers. In addition, six percent indicate that their healthcare provider monitors their health values remotely and contact them if something is wrong (**Figure 3.4**).

About four out of ten nurses (hospital and general practice nurses) indicate that their organisation uses telemonitoring. Among elderly care nurses this is nine percent. In addition, one fifth of general practitioners and one fifth of medical specialists indicate that telemonitoring is used in their organisations. Among medical specialists this number has grown over the past few years (**Figure 3.5**). The majority of the healthcare providers use telemonitoring for a small part of their patient population, i.e. 10 percent or less (Table 3.7).

Figure 3.3

Healthcare users and people with a chronic condition Percentage experiencing positive effects of self-monitoring health values; in 2019.
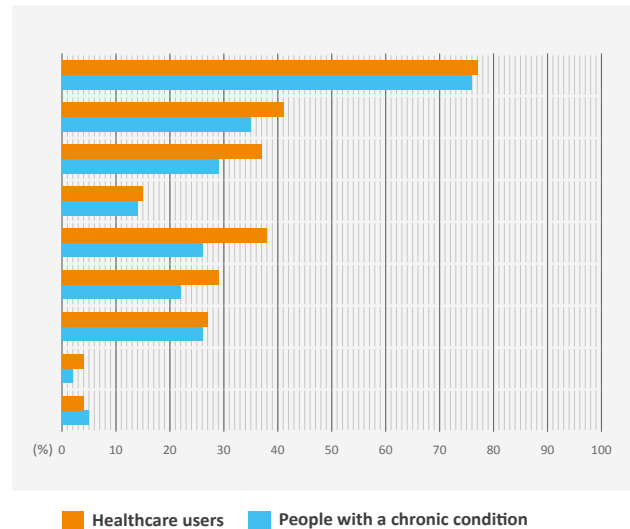
I can check whether my measured values are within certain limits

I feel this gives me more control over my health

I feel this gives me more peace of mind about my health

I feel more involved in the treatment of my disease

It gives me more insight into the effect of my behaviour on my health

It enables me to modify my behaviour of medications sooner

I know sooner that I have to contact my healthcare provider

Other, i.e.

I don't experience any positive effects

■ Healthcare users ■ People with a chronic condition

Figure 3.4

People with a chronic condition Ways in which health values are measured and shared; in 2015, 2017 and 2019.
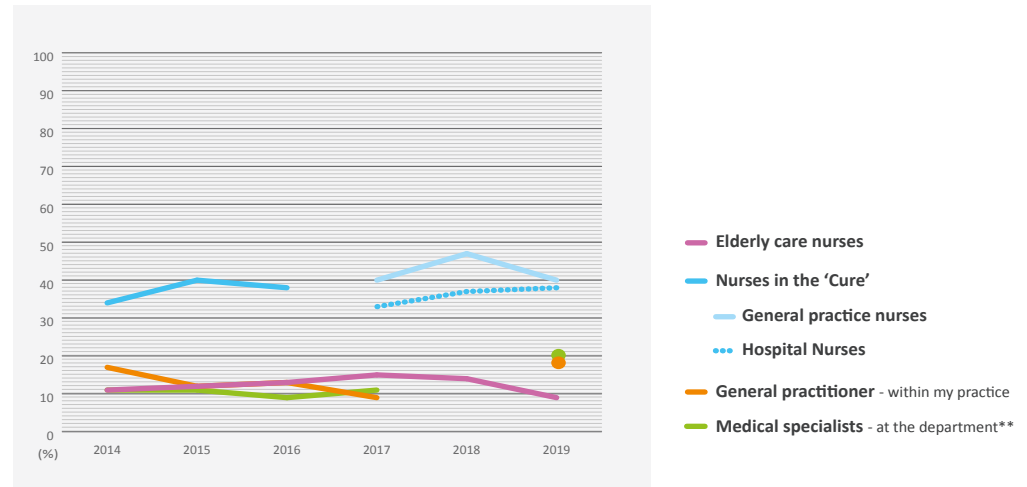** p ≤ 0.01
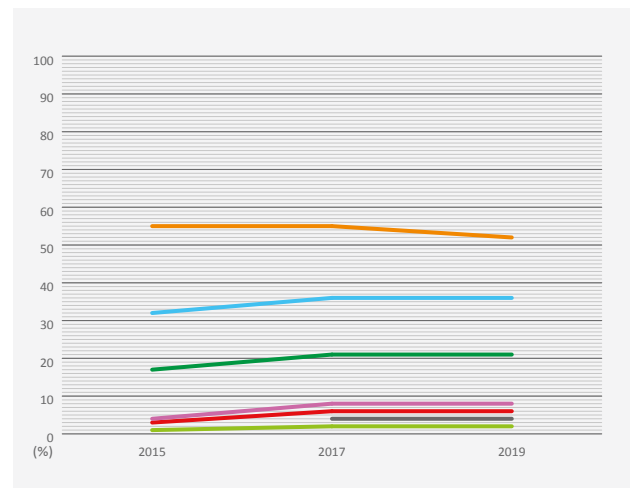
My healthcare provider keeps track of my self-monitored health data remotely and contacts me if something is wrong.

My healthcare provider keeps track of my self-monitored health data remotely

My healthcare provider reviews my self-monitored health data before or during a consultation and discusses them with me

My healthcare provider can check my healthcare data on a website or via an app on the phone or tablet

I send my self-monitored health values electronically to my healthcare provider (e.g. via e-mail or automatically via the computer or an app on my phone)

I bring a paper copy of my self-monitored health values to appointments with my healthcare provider

I monitor my health data for my own use only and I don't share them with a healthcare provider

Nurses use telemonitoring more than doctors in the organisations. One explanation for this is that telemonitoring is more in line with the supportive, coaching role of the nurse. The low use of telemonitoring in elderly care might be because this population requires more personal assistance and direct monitoring. This sector also makes more use of other monitoring techniques (see also Theme Discussion *Remote assistance and support*). Telemonitoring appears to be helpful for (vulnerable) elderly patients, but in order for this to happen, they require more assistance to make the independent monitoring easier for them[15].

Healthcare providers and patients see the added value of telemonitoring

Four out of ten people with a chronic condition think telemonitoring will be convenient for them (Table 3.20). The numbers also show that healthcare providers see the added value of telemonitoring; the majority of the hospital nurses and general practice nurses (58 and 79 percent) and of the doctors (approximately 60 percent) feel that telemonitoring contributes to the self-sufficiency of patients (**Figures 3.6a and 3.7a**). In addition, one third of the medical specialists think telemonitoring would be helpful for 50 to 100 percent of their patient population (Table 3.8).

Figure 3.5
Nurses and doctors
Use of telemonitoring in the organisation; in 2013-2019.
** p ≤ 0.01

Legend:
- **Elderly care nurses**
- **Nurses in the 'Cure'**
- **General practice nurses**
- **Hospital Nurses**
- **General practitioner** - within my practice
- **Medical specialists** - at the department**

What is interesting is the difference between the experiences and expectations of the medical specialists. For example, 30 percent of the medical specialists without practical experience with telemonitoring (N=146) think that telemonitoring will contribute to the self-sufficiency of patients, while 57 percent of the medical specialists who are already using it (N=35) have actually seen this result. In addition, 14 percent of the medical specialists think that telemonitoring will improve the quality of life and 55 percent has seen that this is, in fact, the case (Table 3.10) (**Figure 3.7a**). It would seem that sharing positive experiences is important to encourage other healthcare providers to start using telemonitoring.

Since only a limited number of elderly care nurses use telemonitoring, we cannot say anything about the benefits of telemonitoring as experienced by this group, although 61 percent of the elderly care nurses do think that telemonitoring can contribute to the self-sufficiency of patients. In addition, 42 percent of the elderly care nurses think that telemonitoring can decrease the work load (Table 3.9).

However, nurses and doctors experience negative effects as well in terms of the time it takes to keep track of the values measured by the patients and to follow up on the notifications and additional contact moments (**Figures 3.6b and 3.7b**) (see also Theme Discussion *Necessity and added value*). In addition, one fifth of the hospital nurses and general practice nurses

Figure 3.6a
General practice nurses and hospital nurses
Experience benefits from telemonitoring; in 2019.
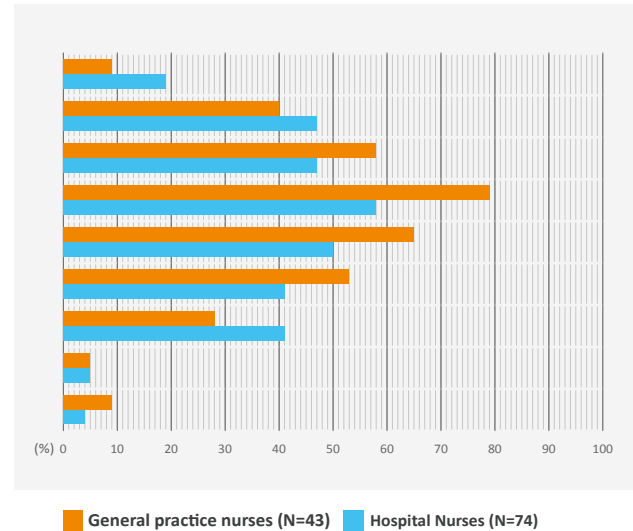
- It reduces the workload
- It saves clients and/or informal care network time
- It improves the quality of the healthcare in my organisation
- It promotes the self-sufficiency of clients
- It gives me more insight into the health of my clients
- It enables me to tailor the healthcare plan/treatment plan to the individual situations of my clients
- It enables clients to get help sooner
- Other benefits
- I don't experience any benefits

General practice nurses (N=43)   Hospital Nurses (N=74)

Figure 3.6b
General practice nurses and hospital nurses
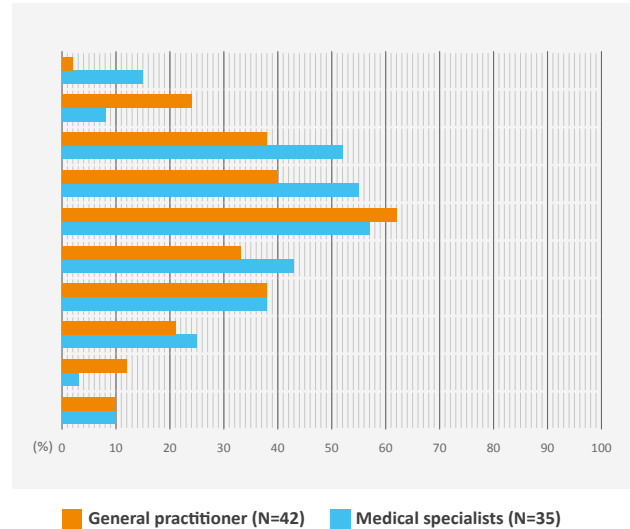Experience disadvantages from telemonitoring; in 2019.
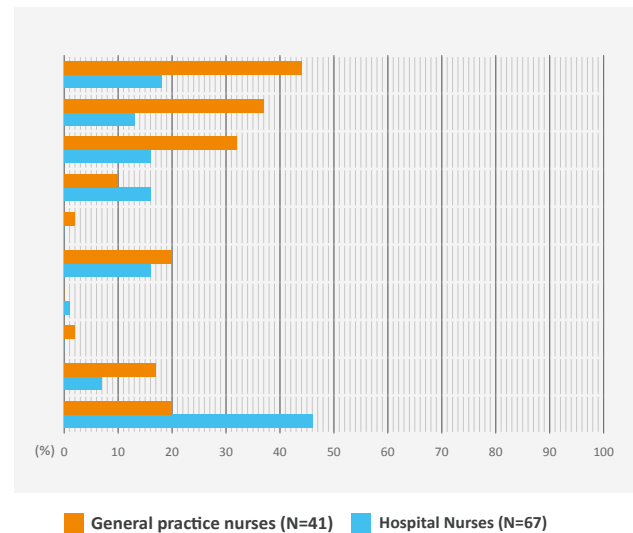
- It takes me a lot of time to track/monitor health values
- It takes me a lot of time to follow up on notifications
- It causes clients and/or those around them to initiate contact more often
- It is a cause for concern for clients and/or those around them
- I find it difficult to work with
- I find it difficult to assess which clients will be able to use it
- The system produces unreliable data
- The application is not secure
- Other disadvantages
- I don't experience any disadvantages

General practice nurses (N=41)   Hospital Nurses (N=67)

and one fifth of the doctors find it difficult to assess which patients are capable of using telemonitoring and the related applications (Tables 3.11 and 3.12). It is notable that only 7 percent of the people with a chronic condition feel that telemonitoring takes a big effort (Table 3.20).

The expectation is that apps and websites will give patients more insight into their health

More than half of the healthcare users and healthcare providers and more than one third of people with a chronic condition are of the opinion that apps and websites that are especially geared towards personal health or the patient's treatment can give patients more insight into their health. In addition, it is primarily hospital nurses, general practicenurses and medical specialists who indicate that websites or apps where patients can keep track of their own health and treatment data and websites or apps where patients can fill out a checklist or questionnaire to indicate their subjective experience of their health or treatment can give people more insight into their own health (Tables 3.21-3.27).

Figure 3.7a
Doctors
Experience benefits from telemonitoring; in 2019.

It reduces my workload
It reduces the workload of my support staff
It saves patients and/or those around them time
It improves the quality of healthcare in my practice / at my department
It promotes the self-sufficiency of my patients
It gives me more insight into the health of my patients
It enables me to tailor the treatment plan to the individual situation of the patient
It enables patients to get help sooner, or it ensures that help is called in sooner
Other benefits
I don't experience any benefits

■ General practitioner (N=42) ■ Medical specialists (N=35)

Figure 3.7b
Doctors
Experience disadvantages from telemonitoring; in 2019.
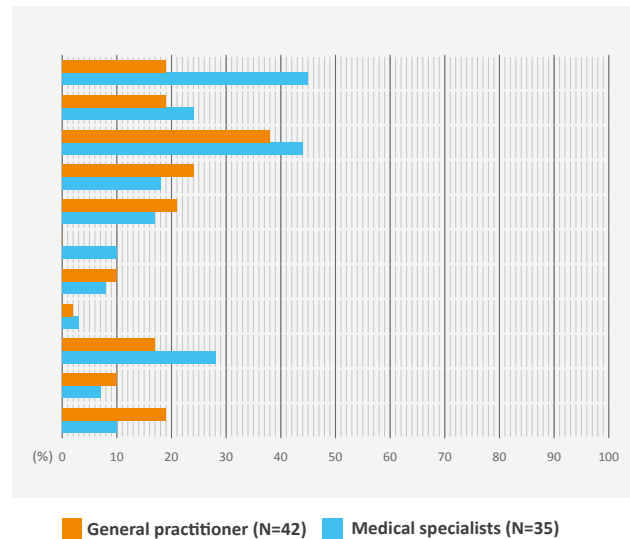
It takes me a lot of time to track/monitor health values
It takes me a lot of time to follow up on notifications
It takes my support staff a lot of time
It causes patients and/or those around them to initiate contact more often
It is a cause for concern for patients and/or those around them
I find it difficult to work with
I get unreliable data
The application is not secure
I find it difficult to assess which patients will be able to use it
Other disadvantages
I don't experience any disadvantages

■ General practitioner (N=42) ■ Medical specialists (N=35)

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