Research paper

Measuring patient trust in telemedicine services: Development of a survey instrument and its validation for an anticoagulation web-service

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Background: For many eServices, end-user trust is a crucial prerequisite for use. For the telemedicine context however, knowledge about the coming about and measurement of end-user trust is scarce.

Objective: To develop and validate the PAtient Trust Assessment Tool (PATAT): a survey instrument to quantitatively assess patient trust in a telemedicine service.

Methods: Informed by focus groups, we developed a survey that includes measurement scales for the following factors: trust in the care organization, care professional, treatment, and technology, as well as a scale that assesses a holistic view on trust in the telemedicine service. The survey was completed by 795 patients that use a telemedicine application to manage their anticoagulation treatment. Data were analyzed by means of Partial Least Squares Structural Equation Modeling (PLS-SEM).

Results: The measurement model yielded good to excellent quality measures, after the removal of one item. The causal model resulted in high explained variance (R² = 0.68). Trust in healthcare professionals and the treatment had a small effect on overall trust, while trust in the technology displayed a large effect. Trust in the care organization did not result in a significant effect on overall trust.

Conclusion: The PATAT is a valid means to assess patient trust in a telemedicine service and can be used to benchmark such a service or to elicit redesign input.

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1. Introduction

“Never trust anything that can think for itself if you can’t see where it keeps its brain,” is what Mrs. Weasley says to Harry and Ginny in Harry Potter and the chamber of secrets. And although she is referring to a talking book, the fear she experienced may just as well have concerned a telemedicine service. Such health services allow patients to self-manage a chronic disease, consult a healthcare professional, or educate themselves about a specific condition. For this goal, these technologies use personal medical data, apply complex algorithms, and retrieve input from sensors placed on patients’ bodies or in their houses. For many laypersons, all the things that happen ‘inside’ a telemedicine service are indistinguishable from magic, which is why trust can be considered to be a crucial prerequisite for use [1].

Telemedicine services are defined as health services that enable patients to receive treatment in their daily living environment, whereby distance is bridged by ICT, and at least one healthcare professional is involved [2]. Examples include teleconsultation services whereby patients talk with a healthcare professional via video-chat or online services that provide physical exercise videos according to a personal training schedule, created by a physical therapist. We see patient trust in a telemedicine service as a patient’s willingness to rely on such a health service (and the factors that make up this service) during their treatment. In other words, trust is the willingness of a patient to surrender oneself to a telemedicine service in exchange for personal gain (such as improved quality of care, or time savings). This trust is multi-dimensional, and is most likely to be the sum of trust in several factors that make up the telemedicine service, which can each be trusted to a smaller or larger degree. For example, trust in a telemedicine service may be affected by how much a patient trusts the doctor that prescribes the service or the visual design of the smartphone app that is a part of it.

Articles that discuss what makes up trust in a telemedicine service are scarce [3], while the articles that do address the issue,
mostly explain trust from healthcare professionals’ point of view. Professionals’ trust in electronic health care records appeared to be affected by perceived risk and information integrity [4], for an adverse event reporting system the subjective norm influenced trust [5], and finally, trust in any telemedicine application can be expected to be affected by personality traits, posit Brown and colleagues [6]. An article by Veinot and colleagues [7], describes how they developed requirements for developing a trustworthy digital intervention to promote the sexual health of African-American youth. They list a set of requirements that include functionalities such as optional anonymity, and the presence of credible information via a Question & Answer service.

End-user trust in online services has been studied in depth for contexts other than health and was found to be an important antecedent for the intention to use eGovernment services [e.g.,8] and eCommerce websites [e.g.,9]. Furthermore, trustworthiness, expertise and credibility are all factors that have been marked as important for creating persuasive systems designs – i.e., technologies that aim to change end-user attributes and/or behaviors- [10]. The coming about of trust in an online service has been reported in an elaborate, often-cited model of end-user trust in eCommerce by Mcknight et al. [11]. In this model, trust is explained by a myriad of factors, such as trust in the organization behind the technology, perceived website quality, and an individual’s disposition to trust. Other researchers have taken a more design-oriented approach and have focused on creating design guidelines for developing trustworthy websites and eServices. For example, Li and Yeh [12] uncovered the role of design aesthetics for creating trust in mobile commerce, Belk and colleagues [13] found that the mere presence of disclaimers increases end-user trust in eService, and Sillence et al. [14] concluded that visual appeal affects an end-user’s initial decision to mistrust a health information website, while credibility and the option to personalize content affect the end-user’s decision to trust such a website.

When it comes to telemedicine, the end-user (in this case a patient) often does not pay for the service, in contrast to other contexts, such as eCommerce. Furthermore, a telemedicine application is often part of a wider service: medical treatment. The outcome of the service is often of high personal importance and the collection and processing of highly personal data is a prerequisite for service provision. As a result, the formation of patient trust in telemedicine is a unique situation [15,16] and should be treated in a unique manner in research and design. Having the means to assess patient trust in a telemedicine service marks an important step, as it allows for benchmarking different telemedicine services with respect to patient trust. It can also be used to discern features that make a telemedicine service trustworthy or not. Such insights are crucial for developing a body of knowledge on how to design telemedicine services that patients will trust. Ultimately, this will result in higher use, leading to a more effective or efficient treatment. In this article, we discuss the development and validation of a survey instrument to assess patient trust in a telemedicine service: the PAtient Trust Assessment Tool (PATAT). In Section 2, we explain how we have developed the survey instrument and introduce the validation context. Section 3 presents the results of this validation in the forms of a measurement model and a causal model. Section 4, finally, includes our discussion and a set of limitations. Section 5 contains our concluding remarks.

2. Method

2.1. Exploring the concept of trust

First, we explored the concept of trust in telemedicine services via focus groups with patients of two rehabilitation centers in the Netherlands. The setup of these focus groups and their results are reported in [16]. During these workshops, we asked the participants to map what, for them, makes up trust in a patient portal for rehabilitation care that utilizes a wide range of features (e.g., an electronic patient record, services for exercising at home via the provision of a personal schedule and online instruction videos, and daily activity monitoring by incorporating activity sensor data). The focus groups resulted in an overview of factors that potentially affect patient trust in a telemedicine service, and what makes up these factors.

2.2. Trust factors

Based on the focus groups we held with patients, we listed four main factors that, together, we expect to shape a patient’s trust in a telemedicine service. They are:

Trust in the care organization. An individual’s belief that a healthcare organization acts for the individual with the individual’s best interests in mind [17].

Trust in the care professional. An individual’s belief that a care professional (or a team of care professionals) acts for the individual with the individual’s best interests in mind.

Trust in the treatment. An individual’s belief that the treatment he or she is receiving is effective.

Trust in the technology. An individual’s belief that using a specific technology is safe and secure [11].

Following Mcknight et al. [11], and as shown in Fig. 1, we expect these factors to affect the trusting belief: A patient’s perception of how trustworthy a telemedicine service is. A positive trusting belief leads to a positive trusting intention (the willingness to trust the telemedicine service). Once a person has a positive trusting intention he or she is expected to display trust-related behavior (such as using the telemedicine service or sharing personal data via the technology).

The survey instrument to assess patient trust in a telemedicine application (the PATient Trust Assessment Tool, or PATAT), focuses on assessing the patient perceptions of the factors that make up trust in a telemedicine service, as well as a holistic view on trust in the telemedicine service (the trusting belief). Trusting intention and trust-related behavior lie outside the scope of the survey instrument (and thus, this study), as we see trusting belief as the key towards trust-related behavior.

2.3. Measurement scale construction

We created a survey instrument in which each factor of the theoretical model was assessed by means of five statements, accompanied by a five-point Likert scale with five check boxes, ranging from disagree (1) to agree (5).
Trust in the care organization was assessed by three self-devised items (following the focus group: a good reputation, carefully handling personal information, and coming into action when something goes wrong) and two items taken from Walker and colleagues [18]: questioning whether a patient feels at home at the care organization, and whether or not the care organization takes a patient’s specific needs into account.

Trust in the healthcare professional also included three self-devised items that according to the focus group results, affect trust in this factor (the professional's competence, his or her openness towards the patient, and his or her discreteness while handling patient data), as well as two items taken from Thom et al. [19]. These items focused on a patient’s tendency to follow a healthcare professional’s advice, and the patient’s estimation that his or her healthcare professional does everything in his or her capability to provide good medical care.

Trust in the treatment was operationalized by creating items for each aspect that makes up this kind of trust, according to the focus group participants: quality of the treatment, clarity of what the treatment entails, and the degree to which the decision for a specific treatment was a collaborative decision between the healthcare professional and the patient. Quality and clarity were assessed both by two items, due to the fact that they were named far more often as ‘important’ than shared decision making during the focus groups.

Trust in the technology was assessed by four self-devised items, again as a result of the focus groups. These items focused on control, anonymity while using the technology, preservation of data, and usability. Finally, we supplemented these items by one item, taken from Carter and Bélanger [8], which questions the respondent’s view on the trust induced by legal policy and technological safeguards.

Trust in the telemedicine service, finally, was assessed via three items taken from De Ruyter and colleagues [20] Trust in eService scale, and two self-devised items, targeting a holistic view of trust.

Before deploying the survey among a large sample of patients, we pre-tested the survey instrument for clarity and legibility with seven patients from a rehabilitation center in the Netherlands who make use of the center’s telemedicine services. All pretest participants were asked to complete the survey and to think-aloud while doing so. This way, every difficulty or misunderstanding could be elicited. As a result of the pre-test, one item was reworded to make it easier to read and one item was changed as the participants interpreted it differently from what we intended. Finally, several participants stated that they needed some experience with the telemedicine service under investigation before being able to complete the entire survey. The final survey can be found in Table 1.

### 2.4. Validation context

The survey was spread among patients using an online Anticoagulation service. This telemedicine service allows for patients to determine their International Normalized Ratio (INR) value (a prothrombin time measurement) themselves and to enter it into their personal online dossier via PC, tablet or smartphone on a website. Alternatively, a trained professional can do the test if the patient is unable to. The results of the test are monitored by healthcare professionals at a distance and they adjust the anticoagulant treatment if necessary, which is communicated via a telecommunication module on the website to the patient. How often a patient needs to use the service depends on his or her individual situation. While a set of patients needs to use the service on a weekly basis, others can do with less frequent use. Patients are provided training services alongside the telemedicine service that focus on explaining anticoagulation treatment and self-management. The service provides many benefits for patients as it allows them to test their INR at any place and any time (instead of having to make an appointment and visit a test site) and provides a gain in efficiency for anticoagulation clinics and healthcare professionals. Fig. 2 provides a screenshot of the service.

Two healthcare organizations that provide care to patients with thrombosis and that make use of the online anticoagulation service participated. For each organization, an online survey was created using Surveymonkey. The organizations then invited their patients to participate by sending out a web link to the survey. Prior to participating, patients provided informed consent. Then they answered some methodological questions, after which they were presented the PATAT. The nature of this internet-based survey among voluntary patients did not require formal medical ethical approval, according to Dutch law.

### 2.5. Statistical analyses

We used descriptive analyses to describe the participants’ demographics. Validation of the measurement model and assessment of the causal model was done by means of Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 3.0. Guidelines for model development and quality criteria were taken from Hair Jr. et al. [21]. Missing items were dealt with by replacing

<table>
<thead>
<tr>
<th>Table 1</th>
<th>The PATient Trust Assessment Tool (PATAT).</th>
</tr>
</thead>
</table>
| Trust in the care organization | 1. [Care organization] has a good reputation  
2. [Care organization] they handle my personal information carefully  
3. [Care organization] they take action when something goes wrong  
4. [Care organization], I feel at ease  
5. [Care organization], they take my specific needs into account |
| Trust in care professional | 6. I trust my [doctor’s] judgment about my medical care  
7. My [doctor] provides me with all the information on all potential medical options  
8. My [doctor] keeps all my medical information private  
9. I always follow my [doctor’s] advice  
10. My [doctor] does not do everything [he or she] should about my medical care |
| Trust in treatment | 11. The treatment I receive is effective  
12. It is clear to me what the treatment I receive entails  
13. Together, my [doctor] and I made the choice for this treatment  
14. The treatment I receive is not helping me enough  
15. It has been explained well to me what my treatment entails |
| Trust in technology | 16. When I use [the website], I am in control  
17. Everything that I do on [the website] remains private  
18. The personal information that is stored at [the website] will not get lost  
19. [the website] is easy to use  
20. Legal policy and technological safeguards make [the website] a safe environment |
| Trust in telemedicine service | 21. I can trust [this website]  
22. I can trust that possible problems with [this website] will be solved properly  
23. I can trust this service less than other online services, such as Bol.com and the website of my municipality  
24. I feel at ease when working with [this website]  
25. I do not like to enter my personal data on [this website] |

Note: the terms ‘doctor’ and ‘website’ should be adapted to the application context (e.g., doctor may be replaced by physical therapist, or website with smartphone app).
them by means. Those interested in detailed explanations of the statistical analyses and the criteria we used, are advised to refer to Hair Jr. et al. [21].

3. Results

3.1. Demographics

In total, 3933 invitations to complete the online survey were sent out. This resulted in 856 participants. This sample included entries that were incomplete. Those entries that included 10 or more missing values were omitted from analyses. Mostly this referred to participants who abandoned the survey after answering the questions about demographics. As a result, 61 participants were excluded, leading to 795 surveys that were analyzed and a response rate of 20.21%.

Of these 795 participants, 537 were male (67.5%) and 258 were female (32.5%). Their average age was 68 years (Std Dev 11 years). The majority of the patients (630, or 79.2%) measured their INR value themselves; 165 patients (20.8%) did not. Next, 604 patients (76.0%) entered their INR values into the digital logbook themselves, while 191 patients (24.0%) did not. Finally, when we asked them how often they make use of the digital logbook, 15 patients (1.9%) answered ‘daily’, 51 patients (6.4%) answered ‘a few times a week’, 174 patients (21.9%) answered ‘once a week’, 464 patients (58.4%) answered ‘a few times a month’, and 91 patients (11.4%) answered ‘(almost) never’.

3.2. Measurement model

The first step in determining the quality of the measurement model was to determine the outer loadings of the individual items. This was done to determine the convergent validity of the measurement scales. Basically, outer loadings indicate to what degree a set of items share communality and how much of the construct’s variance can be extracted from each single item that measures the construct. All items except one resulted in satisfactory scores. The item Trust in care professionals 5 had a very low outer loading (0.39). This specific item was negatively worded and quite long and may therefore have been misunderstood by the participants. We therefore removed the item from the measurement model. Table 2 shows the cross loadings of the remaining items. It shows that the items assess their latent variable well and do not cross load on other variables (which would suggest that an item measures a different variable than the one we anticipated).

Next, we determined scale reliability by assessing the composite reliability (a criterion for internal consistency that takes into account the different outer loadings of the items that make up a construct), average variance extracted (AVE; the average variance in the items that can be explained by the common factor), and

<table>
<thead>
<tr>
<th>Item</th>
<th>TO</th>
<th>TT</th>
<th>TCP</th>
<th>Ttech</th>
<th>TTS</th>
</tr>
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<td>TO1</td>
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<td>0.57</td>
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<td>0.45</td>
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<tr>
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<td>0.50</td>
<td>0.59</td>
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<td>0.84</td>
<td>0.57</td>
<td>0.43</td>
<td>0.47</td>
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<tr>
<td>TT2</td>
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<td>0.48</td>
<td>0.37</td>
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<tr>
<td>TT4</td>
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<td>0.57</td>
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<td>0.79</td>
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<td>0.49</td>
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<td>0.40</td>
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<tr>
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<tr>
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<td>0.26</td>
<td>0.26</td>
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</tbody>
</table>

Note: TO = Trust in the Organization; TT = Trust in the Treatment; TCP = Trust in Care Professionals; Ttech = Trust in the Technology; TTS = Trust in Telemedicine Service; factor loadings of each item on their own construct are displayed bold.
Table 3
Scale reliability for the constructs.

<table>
<thead>
<tr>
<th></th>
<th>Composite reliability</th>
<th>AVE</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
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<tr>
<td>Trust in the organization</td>
<td>0.93</td>
<td>0.74</td>
<td>0.91</td>
</tr>
<tr>
<td>Trust in the treatment</td>
<td>0.87</td>
<td>0.58</td>
<td>0.81</td>
</tr>
<tr>
<td>Trust in care professional</td>
<td>0.89</td>
<td>0.68</td>
<td>0.84</td>
</tr>
<tr>
<td>Trust in technology</td>
<td>0.90</td>
<td>0.64</td>
<td>0.86</td>
</tr>
<tr>
<td>Trust in telemedicine service</td>
<td>0.85</td>
<td>0.56</td>
<td>0.79</td>
</tr>
</tbody>
</table>

Cronbach’s alpha (a traditional criterion for internal consistency) for each construct. Results can be found in Table 3. As composite reliability scores should be >0.708, AVE scores should be >0.5 and Cronbach’s alpha should be >0.7, we can conclude that the measurement scales are reliable.

Then, we checked for multicollinearity by determining the collinearity statistics for the latent variables that explain the endogenous variable. For the case of SEM-PLS, these statistics are Tolerance and the Variance Inflation Factor (VIF). Both criteria provide an indication of how much of a construct’s variance can be explained by items that do not belong to this construct. The results for our measurement model can be found in Table 4. As tolerance scores should be >0.20 and VIF scores should be <5.00 to rule out multicollinearity, we can state that in our case multicollinearity is not a problem.

As a final step in determining the quality of the measurement model, we determined the significance and relevance of the indicators for their latent variable. As PLS-SEM does not assume data to be normally distributed, a nonparametric bootstrap procedure was used so that coefficients could be tested for significance. When you apply a bootstrapping procedure, you draw a large number of subsamples from the original sample, whereby the drawn sample is returned to the sampling population before drawing the next subsample. We conducted a bootstrap procedure with 5000 bootstrap samples to see whether or not the contribution of each item to the measurement of a construct is significantly greater than zero. We have dealt with sign changes (arbitrary differences between the loadings and path coefficients based on the bootstrapping samples on the one hand, and the original sample on the other) by accepting them and accepting the negative impact they may have on the significance level of the individual indicators, as this is the most conservative approach. Except for five items, all items in the survey contributed significantly to the latent variable to which they are linked (i.e., they had a significant outer weight). For the five non-significant items we assessed the outer loading. We did this to determine whether these items have an absolute contribution to the construct, now that they appeared not to have a relative contribution. All of these items had significant outer loadings >0.5, indicating that they do have an absolute contribution. They were therefore retained in the measurement model.

In all, based on the results reported above, we can state that the measurement model of the Patient Trust Assessment Tool (PATAT) is good to excellent, once we remove item Trust in the care professional 5.

Table 4
Collinearity statistics.

<table>
<thead>
<tr>
<th></th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust in the organization</td>
<td>0.53</td>
<td>1.88</td>
</tr>
<tr>
<td>Trust in the treatment</td>
<td>0.54</td>
<td>1.86</td>
</tr>
<tr>
<td>Trust in care Professional</td>
<td>0.44</td>
<td>2.27</td>
</tr>
<tr>
<td>Trust in technology</td>
<td>0.60</td>
<td>1.66</td>
</tr>
</tbody>
</table>

Fig. 3. Causal model for explaining trust in an telemedicine service *p<0.05; **p<0.01.

3.3. Causal model

After the development of a valid and reliable measurement model, we determined the causal model. Again, we apply a bootstrapping procedure with 5000 bootstraps to determine t-values and significance levels for the path coefficients. This has led to the causal model depicted in Fig. 3.

The figure shows that trust in a telemedicine service can be explained to a substantial degree by the exogenous variables in the model (given the R² of 0.68). We found that one antecedent of Trust in the telemedicine service does not significantly affect it, namely Trust in the care organization. Next, we determined the effect sizes of those antecedents that do significantly affect Trust in the telemedicine service by assessing f². This was done by determining the change in R² between a complete model and models in which, each time, a different exogenous construct was removed. This resulted in the following changes in R²:

- Trust in care professional: 0.004 (small effect size)
- Trust in treatment: 0.009 (small effect size)
- Trust in technology 0.243 (medium to large effect size)

Based on the significance level and effect sizes, we can state that Trust in the technology is the most important antecedent of Trust in the telemedicine service. Trust in the treatment and Trust in the care professional also affect Trust in the telemedicine service, but to a far lower extent.

Finally, we determined Stone-Geisser’s Q² value to determine the model’s predictive relevance for each endogenous variable (and as we only have one endogenous variable in our model, the predictive relevance consists of how well the model predicts Trust in the telemedicine service). The resulting Q² value for this variable is 0.37, which stands for large predictive relevance.

4. Discussion

In this article, we discuss the development and validation of the PATent Trust Assessment Tool (PATAT), which consists of a survey instrument to determine patient trust in a telemedicine service. The survey was optimized and validated by means of a large-scale study among thrombosis patients using an online anticoagulation service with near-person INR testing.
The results of this large-scale validation show that the PATAT is a valid and reliable survey instrument with quality metrics that are good to excellent. Furthermore, the causal model that we developed shows that the instrument explains trust in a telemedicine service to a substantial degree for the case of the online anticoagulation service under investigation, with trust in the technology as the most important antecedent of trust in the telemedicine service in general. Trust in the treatment and trust in care professionals also affect trust in a telemedicine service, but to a smaller extent. Surprisingly, trust in the care organization providing the technology did not affect trust in the telemedicine service in this case.

Of course, patient trust in the telemedicine service is only part of the picture. Healthcare professionals are another important primary end-user group and their trust is crucial for the success of the telemedicine service. Do they trust patients to honestly and correctly provide measurement data? Do they think that their personal data is stored safely? Development of a survey instrument to assess healthcare professionals’ trust is therefore an important next step in order to create a complete toolkit for assessing trust in telemedicine services.

4.1. Limitations

The main goal of this study was to develop and validate an instrument for assessing patient trust in a telemedicine service. For this goal, using one case (an online anticoagulation service) was sufficient. But for developing a general, causal model that explains trust in a telemedicine service, using one case only is not. As other (types of) telemedicine services may yield different causal models, this study should be replicated in other health contexts. For example, trust in the organization might be an important antecedent of trust for contexts where healthcare organizations handle very sensitive data (e.g., healthcare organizations providing online services for treating alcohol addiction). Furthermore, the response rate for our survey invitation was 20%, which means that for fully grasping the coming about of trust for this case, a non-response analysis, focusing on the non-responders’ trust in the service, is necessary. Application of the PATAT among multiple types of telemedicine services is a necessity for coming to a general causal model of patient trust in telemedicine services; assuming that it is possible to create one model only, in contrast to multiple models for multiple types of telemedicine services.

Next, there may be factors that explain trust in a telemedicine service, outside those that are assessed in the PATAT. For example, person characteristics (e.g., a person’s general propensity to trust someone or something) may affect this trust. It is possible that inclusion of these factors might further improve the explanatory power of the survey instrument. However, since the application of the PATAT resulted in a high explained variance for trust in the telemedicine service, we think that the instrument is already a very suitable means for assessing and explaining the phenomenon.

Finally, trust may not be a constant factor and may change over time. For example, experience with the technology, noticing the effect of the treatment, incidents such as hackers breaking into the system, or technological problems (such as a website being down) may have a profound effect on patients’ trust in a telemedicine service. Additionally, the coming about of trust in a telemedicine service may be different for first time users or patients that have a lot of experience with the technology (as were most of the patients included in this study). As of yet, the temporal effects of use on patients’ trust in a telemedicine service are unknown. We are looking forward to seeing longitudinal studies that disclose these effects.

5. Concluding remarks

Patient trust in telemedicine services is a highly under investigated field. Nonetheless, trust is an important antecedent of end-user acceptance of digital services and may, thus, be highly important for patients when making the decision to use a telemedicine service or not. Especially now that telemedicine services are becoming pervasive and the collection of huge amounts of personal data has taken a flight, trust will become a more important aspect of telemedicine design. We think that the creation of the PATient Trust Assessment Tool marks a big step forward in researching trust in telemedicine services. It allows researchers and practitioners to determine how trustworthy patients think a telemedicine service is. It can, therefore, be used for benchmarking purposes or to determine whether redesign of a telemedicine service is necessary and on which aspect of the service this redesign should focus. We hope that, ultimately, the survey instrument will contribute to a body of research that, collectively, will provide a set of heuristics for designing telemedicine services that patients can trust.

Summary points

What was already known on this topic?

- For many services, end-user trust is a crucial prerequisite for use.
- For the telemedicine context, knowledge about the coming about and measurement of end-user trust is scarce.

What this study added to our knowledge

- Patient trust in a telemedicine service can be assessed and explained for a large part by administering the PATient Trust Assessment Tool (PATAT).
- Trust in a telemedicine service is the result of trust in several sub-factors.
- When explaining the trust for a telemedicine service to manage anticoagulation treatment, we found that trust in the technology, trust in healthcare professionals, and trust in the treatment affect trust in the telemedicine service.
- Trust in the care organization providing the telemedicine service appeared not to affect trust in the telemedicine service to manage anticoagulation treatment.

Author contributions

LvV drafted the survey instrument, designed the validation study, collected and analyzed the data, and drafted the manuscript as the lead writer. MT drafted the survey instrument and critically reviewed the manuscript. HH drafted the survey instrument. All authors approved the final version of the article.

Conflict of interest

None.

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