Original Paper

Patient Perspectives on a Symptom Assessment App in Emergency Care: Interview Study Among Patients in the AkuSym Trial

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Abstract

Background: Symptom assessment apps (SAAs) allow laypersons to input their medical history and symptoms, generating a report of probable diagnoses and recommending next steps for medical care. Numerous and varied research findings exist regarding their diagnostic and triage accuracy, usability, acceptance, and user characteristics, including use in various settings. However, the perspective of low-acuity emergency patients on the benefits and challenges of using SAAs has not yet been explored.

Objective: This study aimed to explore patients' experiences and attitudes toward the use of SAA before consultation in the emergency department (ED) and to identify perceived benefits and challenges of integrating SAAs into emergency care from the patients' perspective.

Methods: We conducted semistructured interviews with self-referred, walk-in patients at 2 EDs and an ED-associated outpatient on-call practice in Berlin, who were allocated to the intervention group of the AkuSym trial. Participants had self-assessed their health complaints using the Ada Health SAA before their first encounter with the treating physician. Interviews were audio-recorded, transcribed, and analyzed using qualitative content analysis with deductively and inductively developed categories.

Results: Eighteen patients were interviewed between July 2022 and November 2022. Most participants stated that they would use an SAA again, including outside the emergency care setting. Key factors influencing reuse were precise symptom queries and clear, layperson-friendly medical content. Patients' trust in medical professionals was higher than in SAA assessments, and personal doctor-patient contact remained essential. The SAA was perceived primarily as a source of preliminary information and a supplement to doctor-patient contact. It helped participants reflect on and articulate their symptoms. Participants also saw potential for SAAs to support decisions about whether and where to seek medical care, to provide self-help recommendations for minor complaints, and to enable more informed participation in diagnostic discussions. Concerns included inaccurate or incomplete symptom input, difficulties understanding and interpreting SAA results, and receiving alarming or unclear information that could increase anxiety or complicate the subsequent consultation. Identified challenges included enabling information transfer through digital interfaces and ensuring data protection. Participants suggested solutions such as voluntary

access via waiting-room QR codes, linking SAA reports to electronic patient records, and guiding patients to appropriate health care services.

Conclusions: Meaningful integration of SAA use into emergency care requires a clear understanding of how SAA assessments should be used during the doctor-patient consultation, and ensuring accessibility for patients with limited digital health literacy. Such tools have the potential to improve health literacy and empower patients, potentially leading to more efficient health care use. Linking SAA reports to a public website that provides evidence-based, layperson-friendly information and contact details for appropriate health care providers could help patients understand their results and identify suitable care options.

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Introduction

Symptom assessment apps (SAAs) are designed for individuals seeking information on their health concerns. Users input their symptoms, and the SAA generates a report outlining probable diagnoses and/or suggesting next steps for medical care. Research on SAAs has covered their diagnostic accuracy and effectiveness in guiding patients to appropriate care levels, including use in primary care settings and emergency departments (EDs) [1-16]. Diagnostic accuracy varies considerably between SAAs [2,3,10,12,15], as does their capability to perform triage [10,15,17]. SAAs show deficiencies in both diagnostic and triage accuracy [8]. Their diagnostic accuracy has been found to be generally low [2,3,15] or acceptable when confined to patients with urgent symptoms [5]. The triage capabilities of SAAs are found to be more accurate than their diagnostic capabilities [3] and comparable to telephone triage capabilities [5,7,13]. However, SAAs tend toward risk aversion [2,8,9,12].

Studies have also examined the ease of use of SAAs [5,18-20] and identified the characteristics distinguishing users from nonusers [13,21]. The usability and/or acceptability of SAAs were positively perceived by laypersons [5,18-20,22,23]. User characteristics or predictors identified for SAA use were higher socioeconomic status [21,24], younger age [13,21], female sex [13,21,24], hypochondria, and self-efficacy [25].

Current literature addresses the impact of SAA use among healthy individuals, patients, and primary care physicians, as well as the impact on treatment consultations in primary care [19,20,23,26-30]. Most participants in a US cross-sectional survey perceived the tested SAA as a useful tool for receiving information on their health complaints and for getting closer to plausible diagnoses [24]. In an Italian study with patients and physicians of general practice settings, SAA use was positively viewed by patients, whereas general practitioners voiced criticism concerning "the usefulness of patients' self-management and reduction of unnecessary visits" [20]. Wetzel et al [28] determined neither positive nor negative associations between SAAs and primary care in a cross-sectional survey with a mixed method design among the German population.

In a mixed methods pilot observational study, Scheder-Bieschin et al [22] investigated the potential benefits of implementing an AI-driven symptom-assessment tool in EDs. The pilot confirmed strong feasibility, alongside high usability among both patients and health care providers, with strong endorsement for facilitating communication [22]. Additionally, the tool demonstrated clear potential to improve patient-provider interactions and contribute to ED efficiency [22]. However, this study was funded by the app developer, Ada Health. Independent, comprehensive studies examining patients' views on the application of SAAs in emergency settings are scarce. The current study aims to fill this gap by exploring patients' experiences and attitudes toward the use of SAAs before their consultation in the ED. Furthermore, we sought to uncover the possible benefits and drawbacks of adopting SAAs as a standard practice in emergency care from the patients' perspective.

In this study, we focus on the perspective of self-referred walk-in patients with acute symptoms triaged as low priority (Manchester Triage System levels 3 to 5), who were recruited from the randomized controlled trial (RCT) [31] of the same research project (AkuSym). Patients who were pre-examined and came to the ED or the outpatient on-call practice with a referral or with known symptoms (eg, from a chronic condition) were not suitable, as they already had a doctor-patient contact and/or an established diagnosis.

Our research was guided by the following 2 questions: How do patients perceive the use of an SAA before their consultation in the ED or in on-call practice? What are the perceived benefits and challenges of integrating SAAs into the emergency care process, according to patients?

Methods

Study Design

This study was conducted under the umbrella of the "Symptom Checker Apps in Acute Care" (AkuSym) project, which received funding from the German Federal Ministry of Health. AkuSym's methodology encompassed a cross-sectional survey, a multicenter RCT [31], focus groups involving physicians, and patient interviews.

The RCT component was executed across 3 locations in Berlin: 2 EDs at Charité-Universitätsmedizin Berlin (Campus Berlin Mitte and Campus Virchow Klinikum) and a statutory health insurance physicians' on-call practice located at the Jewish Hospital in Berlin. After triage, patients were screened for eligibility by the recruiting study personnel (study nurse, study research assistant, or study physician). Eligible and consenting participants were then randomly assigned by the blinded study team to either the intervention group or control group in a 1:1 ratio. Participants in the intervention group used an SAA on a tablet before their consultation with a physician, while those in the control group proceeded with their visit without using the SAA. Study personnel provided instructions on the use of the SAA (for the intervention group) and the tablet to complete the surveys (for both groups) and were available for assistance throughout the study. For the intervention, the SAA, Ada [32], was chosen from numerous options, based on existing literature regarding its accuracy for diagnosis and triage, its usability, the safety of its recommendations, the range of conditions and main complaints encompassed [5,10,18,33], and its availability in both German and English. None of the researchers were involved in the development of the SAA. Both patients and health care providers were given access to the assessment reports generated by the Ada app before the encounter. However, providers could decide at their discretion whether to view the report at all and, if so, how much of its content to incorporate into the consultation. Patients were not given specific instructions on whether to address the report during the consultation.

To gain insights into the intervention group's experiences and perceptions regarding the use of SAAs, and their potential benefits and challenges in emergency care, we conducted interviews with participants. These semistructured interviews were conducted primarily over the phone unless participants preferred in-person meetings, to facilitate timely discussions post-RCT participation, thereby ensuring participants' fresh recollection of their experiences with the SAA.

Participant Selection

Participants in the intervention group were contacted in case they indicated their interest in taking part in an interview when consenting to the RCT. The eligibility criteria included: (1) participation in the intervention group, (2) willingness to participate in an interview, and (3) proficiency in the German language. To ensure semantic equivalence and avoid data loss, distortion, or bias introduced by translation, all interviews were conducted in German. As shown in the demographics, approximately one-third of the sample reported a nationality other than German, indicating that diverse international perspectives were represented while maintaining methodological consistency.

The first 8 interviews conducted relied on convenience sampling to ensure a steady initial influx of participants. For the subsequent interviews, purposive sampling was used to actively balance the sample regarding age and sex. Since recruitment for the RCT was largely complete at that stage, this approach ensured that the total sample of interviewees mirrored the age and sex structure of the broader intervention cohort. The researchers had no prior acquaintance with the participants.

Data Collection

Semistructured interviews were conducted using a guide developed within the project team and discussed at an interdisciplinary researchers' workshop (Multimedia Appendix 1). The interview guide was developed deductively based on the study objectives and the patient journey, resulting in five thematic blocks corresponding to the chronological stages of the study on site: (1) description of the situation prior to study participation, including the reason for visiting the emergency room/on-call practice and participants' basic attitudes toward and expectations of using SAAs; (2) recalling the concrete use of the SAA during the study; (3) personal reaction to and handling of the SAA assessment report while waiting for the doctor; (4) subjective impression of the doctor-patient contact; (5) personal conclusions after treatment regarding the use of SAAs, adequate user groups, application scenarios, and potential and risks concerning the implementation of the SAA as a standard procedure in the acute care setting.

To facilitate the interviewee's speech and to focus on the research questions, each thematic block began with an introductory question, followed by several guiding questions. Each interview was audio-recorded. Before each interview, the participants gave their written consent. For telephone interviews, participants received the study information and consent form by mail, together with a prepaid return envelope, and returned the signed consent form to the Institute of General Practice and Family Medicine at Charité–Universitätsmedizin Berlin prior to the interview. For in-person interviews, participants received the documents in advance by email or mail, according to their preference. They either signed the consent form on site before the interview or brought the previously signed form to the interview. After each interview, the participants answered a short questionnaire on sociodemographic data (Table 1) and received a small expense allowance in the form of an online shopping voucher valued at €30 (€1=US $1.04 as of July 1, 2022). Data saturation was reached after 16 interviews; 2 additional interviews were conducted to confirm saturation, resulting in a total sample of 18 participants.

Table 1. Participant demographic data (N=18).

Characteristic	Value
Sex, n	
Male	8
Female	10
Age (y), mean (SD; min-max)	35.6 (12.94; 19-64)
Highest school-leaving qualifications, n	
Lower secondary education	3
Secondary education	5
General qualification for university entrance/vocational baccalaureate diploma	10
Highest educational qualifications, n	
No professional training (until now)	3
Vocational school/apprenticeship [34]	5
Technical school/master school/specialist academy	1
University/university of applied sciences	7
Other	2
Country of birth, n	
Germany	13
Other European Union country	3
Non–European Union country	2
Study center, n	
Charité Universitätsklinikum Campus Berlin Mitte	6
Charité Universitätsklinikum Campus Virchow	8
On-call practice of the KV-Berlin[a]	4

[a]KV-Berlin: Kassenärztliche Vereinigung Berlin (Association of Statutory Health Insurance Physicians Berlin).

Data Analysis

We used qualitative content analysis, following the approach outlined by Kuckartz [35] for our data analysis. Initial codes were deductively generated based on the interview guide. As the coding proceeded, additional codes were inductively derived from the content itself. CS, DK, and HN were involved in the coding process, comprising 4 "coding rounds," including a test coding session. The transcripts were coded independently by the 3 researchers (CS, DK, and HN) and then cross-checked. Discrepancies were discussed within the team, and several adjustments to the categories were made before finalizing the code book. Codes with the same content were grouped together. Each code was paraphrased and interpreted.

The software MAXQDA (version 2022; VERBI GmbH) facilitated the data analysis process, with coding and analysis of the transcripts performed in German. For the purposes of this paper, quotes from the interviews were translated into English by CS, with support from the AI translation software DeepL Pro (DeepL SE).

Ethical Considerations

Ethical approval was granted by the ethics committee of Charité–Universitätsmedizin Berlin (EA2/284/21). Data safety was adhered to in line with the General Data Protection Regulation [36] and local law. All participants provided written informed consent prior to their interviews. The study was prospectively registered in the German Clinical Trials Registry (DRKS00028598). We followed the COREQ (Consolidated Criteria for Reporting Qualitative Research) [37] and the SRQR (Standards for Reporting Qualitative Research) guidelines [38] to ensure comprehensive and transparent reporting of our qualitative research findings.

Results

In total, 18 interviews were conducted in the period from July 2022 to November 2022. Of these, 17 interviews were held on the telephone, and 1 interview was conducted face-to-face. The length of the interviews ranged from 12 to 56 minutes. The shortest interview, lasting 12 minutes, involved a participant who strongly rejected the SAA and provided brief responses.

Demographics

The 10 female and 8 male participating patients had an average age of 35.6 (SD 12.94) years. Most interviewees attained the highest level of school-leaving qualifications (n=10) and the highest level of educational qualifications (n=8). All 18 interviewees had their place of residence in an urban area. Nearly one-third of the interviewees were born abroad. For details see Table 1.

Overview of Categories

Our analysis led to the creation of a system comprising 5 principal categories, as detailed in Table 2. Each of these main categories was further divided into 2 to 7 subcategories. The system of categories, including the definitions of the 5 main categories and their respective subcategories, can be

found in the appendix (Multimedia Appendix 2). A table of selected interview quotes is also included (Multimedia Appendix 3).

Table 2. Overview of categories and subcategories.

Category	Subcategories
Health-related information gathering	• Previous experience with SAAs[a] • Experience with alternative/present information paths/types • Basic attitude toward digital information gathering, particularly regarding SAAs
Doctor-patient relationship	• Evaluation of the doctor-patient relationship during the study • Impact of SAA use on doctor-patient interaction during the study • Basic attitude of patients toward medical doctors • Differences/comparison between SAA and standard medical care • Patients' trust in SAA, medical professionals' expertise, and their own health literacy • Tension/dilemma between informed patients and medical expertise • Patient dissatisfaction with missing/unclear diagnosis
Experiences with using the SAA "Ada"	• Congruence or incongruence of the "SAA diagnosis" with the medical diagnosis/with own assumption • Patients' expectations toward the SAA before the first use • Influence of SAA assessment report and the entire SAA use on own understanding of disease and emotional state • App: positive issues/advantages • App: negative issues/disadvantages • Suggestions for improvement and requests regarding the use of the Ada app • Personal conclusions after SAA use
User groups/application scenarios for SAAs	• Appropriate users + "necessary competencies" • Inappropriate users + "impeding/aggravating properties" • Application scenarios/criteria
Future/potential integration of SAAs in the care setting	• Advantages/potentials of (future) SAA use • Disadvantages/risks of (future) SAA use

[a]SAA: symptom assessment app.

Patient Perspectives on Using an SAA Prior to Consultation in the ED or on-Call Practice

We present detailed findings from the 4 subcategories that yielded data directly relevant to our research questions.

Impact of SAA Use on Doctor-Patient Interaction During the Study

Of the 18 interviewees, 3 (16.7%) reported that the use of the SAA had an influence on the doctor-patient interaction; specifically, they felt better prepared and more reassured when their suspected diagnosis was confirmed by the SAA, or they appreciated the opportunity to compare the results with the physician's assessment:

> *I definitely think that, yeah, you already have it in the back of your mind. And I think that you also somehow go into a conversation like that differently, because you already have some information about what it could be, and then, of course, you compare that with the information the doctor gives you.* [ID13, 59]

Two participants were uncertain about its impact, while the majority, 13 out of 18 (72.2%), stated that the use of the SAA had no influence on the doctor-patient interaction. Moreover, 16 participants reported that the use of the SAA was not addressed during the consultation, neither by the physician nor by the patient. Participants cited different reasons for this, including not feeling the need to address it because they considered the physician's assessment plausible or identical to the SAA's or to their own assessment, not bringing it up because the doctor did not, not thinking of it, forgetting to mention it, feeling that the doctor was under time pressure, being too tired to discuss it, or feeling that the SAA use did not play any role in the encounter:

> *I have to admit, the moment I was sitting in that room waiting for the doctor—or when the doctor walked in—I wasn't really thinking about the app anymore. It had faded into the background.* [ID04, 51]

Two participants mentioned their involvement in the AkuSym study to their doctors; however, the use of the SAA itself was not discussed. One participant had prior experience with a different SAA. Of the 18 interviewees, 17 (94.4%) stated that they would consider using an SAA again in the future, including remote use.

Patients' Trust in Medical Professionals' Expertise, the SAA Assessment, and Their Own Health Literacy

The possibility of an SAA substituting for direct doctor-patient interaction was not a focus of the study, a detail made

clear to participants from the start. However, many interviewees still linked SAA use to traditional medical care, viewing it as an alternative form of consultation. They ultimately viewed SAAs as a supplement to, or a second opinion for, the traditional doctor-patient dialogue, rather than a replacement. This preference was deeply connected to a greater trust in doctors over SAAs and was attributed to the value of physical examination and the belief that an app cannot match the quality of medical care and information provided by a human doctor:

> *Well, I would say this: the trust in a doctor who can see with their own eyes or maybe even hear how I am doing is definitely higher than the trust in an app.* [ID01, 82]

Interviewees skeptical about the trustworthiness of SAAs also voiced concerns about the credibility of advice given by SAAs, like being urged to seek emergency care. Some interviewees doubted their capacity to accurately understand the SAA assessment in terms of its content and medical jargon. They believed it was nearly impossible for nonexperts to determine the relevance or accuracy of any diagnosis proposed in an SAA assessment report to their specific situations. According to them, diagnosing is strictly a doctor's responsibility:

> *Well, I would say that the language is more scientific, medical, so to speak. And as a layperson, it would be difficult for me to say, okay, it is this or that or that? I would really say that a doctor definitely has to make the decision.* [ID10, 19]

Apart from comprehending the SAA assessment, some interviewees doubted their ability to correctly input data into the SAA's symptom query. As a result, certain participants expressed concern that doctors might be swayed by inaccurate outcomes in the SAA report caused by improper data entry. Concurrently, they anticipated that their doctor would identify any inaccuracies in data entry. They wished for doctors to maintain trust in their professional judgment when diagnosing (ID04, 69).

Nonetheless, most interviewees valued the use of an SAA for offering preliminary findings or an initial evaluation (ID13, 11). Moreover, a few expressed a preference for SAAs over search engines when seeking evidence-based information on health issues (ID10, 87).

Advantages and Potential of (Future) SAA Use

Care Recommendations and Guidance

When discussing the potential benefits of integrating SAAs into the standard practice of emergency medical care, many interviewees noted that, if proven reliable, these tools could help determine the necessity and type of medical assistance required, such as whether to consult a general practitioner, visit the ED, or an outpatient on-call practice.

Furthermore, the study participants expressed a desire for SAAs to provide self-help tips or action recommendations for minor ailments. They believe that a more informed approach to seeking medical care could help reduce unnecessary medical consultations, including visits to the general practitioner or the ED:

> *I think I would also use this to assess in advance whether it is serious enough that I need to see a doctor. Or is it so bad that I need to go to the emergency room? Wouldn't the general practitioner be sufficient for now? Or could I perhaps help myself first? I think this could also help prevent unnecessary doctor visits.* [ID13, 67]

Additionally, the importance of possessing preliminary information to actively participate in the diagnostic process was highlighted. According to the participants, this involves discussing potential diagnoses collaboratively with the physician, on an equal basis, while still honoring the physician's professional expertise (ID13, 81).

The precision and detail of the particular SAA's symptom query were appreciated. A few mentioned that it allowed them to share more details about their symptoms than is typically possible in a doctor-patient conversation, which can be limited by time constraints (ID14, 62). An advantage pointed out by many participants was that the SAA use enabled them to reflect on and articulate their symptoms more thoroughly:

> *It definitely gave me a sense of more security. I believe that having an overview in my mind of what points have actually occurred, what the symptoms are, was also good for me to gain clarity. Since when have I had which symptoms, and so on.* [ID14, 56]

Some interviewees believed that being able to describe their symptoms more accurately, or having fewer questions after using an SAA, could lead to more time-efficient medical consultations.

Moreover, some participants suggested that SAAs, due to their AI algorithms, might excel at generating differential diagnoses compared with doctors. They speculated that comparing the SAA report with a physician's evaluation could also offer practitioners valuable insights, ensuring that all potential diagnoses are considered or providing fresh perspectives (ID01, 90).

Building on these perceived benefits, participants also reflected on how SAAs could be practically integrated into the emergency care process. Their suggestions covered 4 key areas: accessible and voluntary use, integration into clinical encounters, care navigation, and digital infrastructure and data sharing.

Accessible and Voluntary Use

It was suggested that SAA use in the waiting room should be optional, as not every patient may be able to use the SAA due to a lack of technical skills or poor health conditions. Given the widespread use of smartphones, it was proposed to offer a QR code to patients in the waiting room for voluntary SAA use to support the medical assessment process (ID10, 85).

Integration Into Clinical Encounters

When using the SAA remotely, the question was raised as to whether patients needed to present their SAA reports during treatment discussions or whether health care providers can access this information in advance. One participant suggested making the SAA report available to the ED/doctor via a connection to the electronic patient record. However, some participants questioned the utility of providing doctors with the SAA report because it had not been discussed during their consultation (ID09, 68).

In addition, it was suggested that it could be beneficial for medical treatment if the same SAA used for recording symptoms remotely is also used in the waiting room, particularly when tracking symptoms over extended periods. To support this, a diary feature was proposed, as recalling and describing intermittent or recurrent symptoms during doctor-patient interactions can be challenging.

Care Navigation

If the SAA recommends seeking medical aid, some participants wished to be directed to the appropriate level of health care (general practitioner, on-call practice, and ED) and to receive the respective phone numbers or addresses (ID09, 60) and (ID10, 81).

Digital Infrastructure and Data Sharing

Participants raised questions about how to implement digital interfaces for transferring SAA-generated information to health care professionals while ensuring data protection and security.

In the context of digitalization efforts in Germany, there was a suggestion to develop a central online portal that consolidates various health care services. This would offer a unified access point for all health care apps and services (ID10, 115).

Disadvantages and Risks of (Future) SAA Use

When exploring the downsides and risks associated with using SAAs, patients interviewed frequently highlighted the absence of a human element and the importance of having direct, personal conversations with a doctor about their concerns:

> *Well, I'd rather go to the doctor because I prefer face-to-face rather than entering something into a machine and having it spit something out for me.* [ID02, 13]

> *I think it's a clear disadvantage that it lacks a bit of humanity. I mean, when it comes to illnesses, it's of course very important that there is a certain form of humaneness involved. And an app, well, of course, it hardly has that.* [ID05, 78]

Patients implicitly worried that the app could become a substitute for the doctor, although the SAA was explicitly meant as a supplement in the trial.

Some interviewees found the symptom query of the SAA to be imprecise and incomplete (ID17, 12), voicing concerns that this might lead to inaccuracies or omissions in the information conveyed to doctors. A few participants also worried that their ability to use the app accurately could be affected by poor physical or psychological condition while in the waiting room, potentially leading to incorrect symptom reporting (ID14, 74). Both concerns raised fears that doctors might make incorrect diagnoses, especially if they relied on the SAA's assessment while being distracted or overworked (ID14, 78).

Without having experienced it themselves, participants suggested that alarming diagnoses indicated by the SAA could heighten anxiety and worry, particularly in patients prone to anxiety. It was assumed by some interviewees that this could complicate the treatment consultation, as doctors might need to first address the patient's anxiety instead of proceeding with medical history taking and providing information (ID18, 75). Additionally, the doctor-patient interaction might be prolonged unnecessarily if patients seek further explanations, for example, regarding why certain differential diagnoses suggested by the SAA were dismissed.

The main findings of this study are summarized in Table 3.

Table 3. Main findings from patient interviews on symptom assessment app (SAA) use prior to consultation in the emergency department (ED) or on-call practice.

Subcategory	Main findings
Impact of SAA use on doctor-patient interaction during the study	• Influence on interaction: only 3 out of 18 interviewees felt the SAA influenced the interaction (eg, feeling reassured or being able to compare results). 13 stated it had no influence, and 2 were unsure whether it had an impact. • Lack of discussion: 16 out of 18 participants did not discuss the SAA with their doctor, due to the perceived plausibility of SAA assessment or the physician's assessment, time pressure, tiredness, forgetting to mention it, or finding it irrelevant to the encounter. • Future Intentions: 17 out of 18 would consider using an SAA again in the future (including remotely).
Patients' trust in medical professionals' expertise, the SAA assessment, and their own health literacy	• Role of SAAs vs doctors: SAAs are viewed strictly as a second opinion or preliminary tool, never a substitute for human doctors. According to participants, physical exams and human empathy generate substantially higher trust in traditional medical care.

Subcategory	Main findings
Advantages and potential of (future) SAA use	• Challenges for laypersons: complex medical jargon makes it difficult to evaluate SAA accuracy; concerns exist about inputting data correctly and potentially misleading the doctor. • Perceived value: valued for providing initial findings, self-help information, and being preferred over general search engines for obtaining evidence-based health information. • Care guidance and efficiency: helps determine the appropriate level of medical assistance needed (general practitioner, ED, or self-care) to reduce unnecessary visits. • Preparation and articulation: enables patients to reflect on, structure, and detail their symptoms more thoroughly, fostering active and equal participation in diagnostic discussions. • Clinical advantages: AI algorithms may assist in generating comprehensive differential diagnoses and fresh perspectives that doctors might overlook. • Patients' suggestions for integrating SAAs into emergency care: ◦ Accessible and voluntary use: keep SAA use completely optional in waiting rooms via QR codes to accommodate varying tech skills and health conditions. ◦ Clinical integration: connect SAA reports to electronic patient records, use the same SAA consistently across settings (remotely and in the waiting room), and implement a diary feature for tracking intermittent symptoms over time. ◦ Care navigation: direct users to appropriate care levels and provide immediate contact numbers or addresses when medical aid is advised. ◦ Digital infrastructure: establish secure data-sharing interfaces and a unified central online portal for health services.
Disadvantages and risks of (future) SAA use	• Lack of human element: absence of personal, face-to-face empathy, and human touch during vulnerable moments of illness. • Inaccuracies and misdiagnosis: flawed queries or improper data entry (eg, due to poor patient condition) could mislead doctors if relied upon blindly. • Increased anxiety: alarming automated diagnoses could heighten patient anxiety. • Prolonged consultations: consultation time could increase if doctors need to address patients' concerns about alarming app-generated diagnoses or explain why certain app-suggested differential diagnoses were not considered clinically relevant.

Discussion

Principal Findings

This study examined the patient perspective on SAA use in the emergency care setting. Experiences and assessments made by our study participants concerning this topic were mixed and partially conflicting; for example, some interviewees found the symptom query of the app very precise, while others found it somewhat inaccurate or nonexhaustive. However, even those participants who criticized or mentioned insecurities regarding the process of symptom input or the comprehension of their SAA report intend to reuse the SAA again. Whereas some interviewees believed that the use of an SAA could enhance the efficiency of doctor-patient interactions, some of them also expressed concerns that SAA usage might complicate the treatment conversation. Such a variety of findings concerning the patient perspective on SAA use is congruent with the subjective perspectives of SAA users investigated by Müller et al [30]. The authors revealed a "broad spectrum of experiences but also inconsistent aspects" among their interviewees who had previous experience with SAAs, though apart from the emergency care process [30].

The majority of our interviewees reported that the findings presented in the SAA report had no impact on their conversation with the doctor. This could be due to the fact that the report was not discussed during the consultation, either by the physicians or the patients. A comparison with the results from the physician focus groups, which have been conducted as part of the AkuSym project but are not yet published, may offer further insights into these dynamics. The impact of SAA use on the doctor-patient interaction may also have been limited by the fact that not all physicians reviewed the SAA report prior to seeing their patients, as shown in the RCT conducted within the AkuSym project [31]. Nevertheless, our interviewees frequently stated that using the SAA helped them feel better prepared for the doctor-patient contact, either because it prompted them to reflect on their symptoms or on the diagnoses presented in the report, or because they found it helpful to have preliminary information. The aforementioned RCT did not show any statistically significant positive or negative effects of SAA use prior to the consultation, neither on the doctor-patient relationship nor on patient satisfaction [31]. However, although no measurable effects were found, the influence of the SAA was more frequently perceived as positive rather than negative by both physicians and patients [31].

All but 1 participant in our study concluded to use an SAA again for obtaining preliminary information about health complaints. They expressed a high interest in information on possible causes of their symptoms to decide whether and what kind of professional medical help should be sought or to know whether and what kind of self-help measures are

applicable in case of acute but mild or minor complaints. These findings are similar to the results from a feasibility study in general practices in Italy: half of the participating patients concluded to reuse the SAA from home, valuing it as a potential tool for gaining information on initial health complaints, reducing unnecessary medical consultations, and supporting their physicians [20,23].

Our study participants' interest in information about health complaints relates to their striving for health literacy and patient empowerment. Cerezo et al [39] describe patient empowerment as "an enabling process involving a shift in the balance of power, or as an outcome of this process." The statements of our study participants support the assumptions of Altendorf et al [40], who argue that following the evidence-based health information provided by SAAs can strengthen patients' health literacy, thereby facilitating their empowerment. Health care providers and patient-centered care can further enhance the empowerment process, for example, by providing understandable information [41]. A precise and exhaustive symptom query or the provision of comprehensible content and medical terminology for laypersons were key criteria for our study participants to use an SAA again for online health searching.

The findings on health literacy and patient empowerment discussed above conform to the results of a scoping review exploring the impact of SAA use on health care professionals in primary care [26] and to the aforementioned Italian feasibility study in primary care [20,23]. Radionova et al [26] identified 2 potentials of SAAs for layperson empowerment: (1) "providing laypersons with knowledge" on health-related issues as assumable superior alternative to search engines and (2) "layperson activating potential" as laypersons might become more active by assuming self-management and responsibility. Wiedermann et al [23] concluded that SAAs have the potential to empower patients through "offering a sense of agency and participation".

Our participants' aim for patient empowerment and health literacy did not challenge the authority of medical professionals. On the contrary, having experienced the use of an SAA, the interviewed patients clearly stressed out that they continue to have most trust in the expertise of a medical doctor. Similarly, Müller et al [30] figured out that SAA users prioritized their own judgment and the physicians' assessment over the app findings.

Although it was emphasized beforehand that the study's purpose was not to determine whether the SAA could replace doctor-patient contact, participants repeatedly underlined that the use of the SAA could not replace this contact. This attitude was strongly linked to the higher level of trust in doctors, as well as to the importance placed on "the human touch" that comes with personal doctor-patient contact. Consequently, participants perceived the SAA not merely as a supportive tool, but as a potential third actor within the clinical encounter, aligning with the assumptions of Sauerbrei et al [42]. To ensure that the implementation of AI tools positively influences the patient-doctor relationship, the authors recommend actively shaping their role through assistive use and adapting medical education accordingly [42]. This perspective also resonates with work on eHealth ethics in primary care describing a triangulated relationship between patient, eHealth, and primary care professionals, and calling for renewed reflection on the role of human interaction and how shared decision-making is shaped within this triad [43].

Our interviewees not only shared their opinions on the potential integration of SAAs into the emergency care process but also provided suggestions for their practical implementation. One of these suggestions was offering voluntary SAA use via a QR code displayed in the waiting room, while another proposed making the SAA report available to health care providers through the electronic patient record. Such options could be helpful in further exploring the potential of SAAs to contribute to a more efficient medical assessment process for patients assigned a low triage level in an emergency care setting. To implement these options, however, it would be necessary to address challenges in information transfer related to digital interfaces, as well as data protection and security regulations. This was also pointed out by our interviewees.

If the SAA is to be integrated as a standard procedure in emergency care, attending physicians should be instructed to actively address the SAA results during conversations with patients. This is important to avoid patients questioning the purpose of using the SAA prior to their conversation with the treating physician, a concern expressed by some of our participants. How extensively physicians discuss the SAA results with patients could remain flexible.

Further challenges to the use of SAAs in emergency care relate to patients' digital health literacy. Bundsgaard Andersen et al [44] identified a substantial digital divide among patients receiving emergency care, with 43% (203/468) demonstrating low digital literacy. Patients with lower levels of digital literacy were older, frailer, had more hospital admissions during the preceding year, and were less likely to have attained a high level of education [44]. This high proportion suggests that limited digital literacy may constitute a relevant barrier to effective SAA use and potentially contribute to disparities in patients' access to and engagement with these tools.

In a scoping review of eHealth literacy in emergency care, Paller et al [45] reported heterogeneous findings, highlighting demographic and language factors as areas requiring further investigation. The authors recommend that health care providers consider patients' prior internet use and provide appropriate guidance during the ED encounter [45]. They also advocate educating both patients and health care professionals on the effective use of online health information [45].

These findings suggest that the integration of SAAs into emergency care should account for differences in patients' digital health literacy and ensure that the information provided through such tools is accessible and understandable to diverse patient groups.

In the SAA used in this study (Ada), it is possible to save individual symptom queries, but it does not include the diary feature suggested by 1 participant for tracking symptoms over extended periods. However, there exists a wide range of SAAs, including those that provide recommendations for actions, as well as more extensive functions, such as symptom diaries [26].

If seeking medical aid is recommended as part of the SAA assessment, some interviewees requested to be provided with the contact details of the appropriate health care providers. In Germany, SmED (Structured Initial Medical Assessment in Germany [*Strukturierte medizinische Ersteinschätzung in Deutschland*]; in4medicine AG)-Patient is a chatbot for the structured initial medical assessment of patients [46]. This is a digital tool that can support those seeking adequate medical help for treating their symptoms. After guiding users through a symptom query, it provides an initial assessment recommendation and contacts for health care providers in the surrounding area, including EDs, on-call practices, and general practitioners. In contrast to SAAs, it does not offer any treatment recommendations or self-help tips. To date, no empirical studies have been conducted specifically on SmED-Patient. However, "SMASS" (Swiss Medical Assessment System; in4medicine, Inc), which serves as the basis for SmED-Patient, has been evaluated as safe for use in clinical routine [47].

One participant's suggestion goes beyond the integration of the SAA into emergency care: the idea of developing an online portal centralizing all health services and apps. An evidence-based health information web portal [48,49] was implemented by the Dutch College of General Practitioners in 2012 and, 2 years later, resulted in a 12% less health care usage [50]. Although not app-based, the project exemplarily shows that the provision of evidence-based online health information using understandable language can improve resource use in the health care system, potentially through higher health literacy and patient empowerment.

Based on our study findings, we suggest linking the SAA report to a public website that provides further evidence-based, layperson-friendly information, as well as contact details for the appropriate health care providers.

Strengths and Limitations

Qualitative interviews facilitate a thorough examination of personal views on a particular subject. Consequently, the findings from this study enrich the other components of the AkuSym project and expand current knowledge of SAAs. Researcher bias was mitigated through a collaborative coding process involving 3 independent coders.

One limitation of the study concerns the relatively short duration of the interviews. This may be partly due to the interview guideline, which did not focus on biographical aspects or long-term experiences, topics that might have elicited more extensive responses. Additionally, the use of the SAA lasted no more than 10 minutes. Except for 1 participant, none of the interviewees had prior experience using an SAA, which further limited the extent they could report based on past use.

However, this aspect can also be seen as a strength of the study: the perspectives gathered primarily reflect the impressions of first-time users who did not actively seek out the SAA themselves. While the sample is not representative in a statistical sense, it may still offer valuable insights into how individuals in the general population might perceive SAAs when encountering them in a broader, system-integrated context.

All 3 study sites were in a central city district of Berlin. The findings of this study, therefore, might not be directly applicable to more rural regions, where outpatient on-call practices are organized differently, or to health care systems with more integrated solutions, such as that in the Netherlands [48,49]. However, the accessibility of a digital tool can be considered a strength in rural regions, where access to traditional health care is often more difficult than in urban settings. Specifically, using an SAA may prompt someone to drive the distance to care when they might not have done so otherwise.

The study participants sought medical assistance in the ED or the on-call practice on their own, without referral from another doctor and without showing symptoms being part of a known chronic disease. They thereby met the recruitment criteria of the RCT. This probably explains the mean age of the interviewees representing the group of middle adulthood. Besides that, people using digital and online assessment services, including SAAs, are more likely to be "younger and more highly educated" [2]. Also in this study, the interviewees showed high levels of school leaving and educational qualifications. A notable proportion of our study participants (n=7) held a university degree. This characteristic was also observed in the underlying RCT population from which the interviewees were recruited, suggesting that the relatively high level of educational attainment in our qualitative sample may partly reflect the educational characteristics of the RCT population. Given that higher educational attainment is closely linked to increased health literacy [51], this demographic characteristic may have contributed to a more positive perception of the SAA. Consequently, the target group of the interviews for this study was met, but the results obtained from the interviewees are not transferable to other groups.

Conclusions

This qualitative study explored patient perspectives on SAA use in emergency care, particularly the perceived benefits and challenges of integrating SAAs into the emergency care process. Participants valued the SAA for providing preliminary information about their health complaints and helping them reflect on and articulate their symptoms. They also saw potential for SAAs to support decisions about whether and what type of medical care might be appropriate, provide self-help recommendations for minor complaints, and enable more active participation in discussions with physicians. However, these benefits depend on reliable, comprehensive, and layperson-friendly information.

Participants also identified potential drawbacks and risks associated with SAA use in emergency care, including difficulties with symptom input and with the interpretation of SAA assessments, as well as the potential for alarming or unclear information to increase anxiety or complicate the subsequent consultation. The meaningful integration of SAAs into emergency care requires a clear understanding of how SAA assessments should be used during the doctor-patient consultation. Challenges include ensuring secure information transfer and data protection, as well as accessibility for patients with limited digital health literacy. Participants suggested practical measures to address these challenges, including voluntary access to SAAs via a QR code in the waiting room, linking SAA reports to the electronic patient record, and guiding patients to appropriate health care services.

The findings of this study suggest that SAA use may support health literacy, patient empowerment, and more informed decisions about seeking care, potentially contributing to more efficient use of health care. Linking SAA reports to a public website that provides evidence-based, layperson-friendly information and contact details for appropriate health care providers could help patients understand their results and identify suitable care options. Further research should investigate how such approaches can be implemented and evaluated in emergency care, including remote use, while keeping personal doctor-patient interaction at the center of care.

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Generative AI Use

The authors attest that there was no use of generative AI technology in the generation of text, figures, or other informational content of this manuscript.

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Data Availability

The datasets generated or analyzed during this study are available from the corresponding author upon reasonable request.

Authors' Contributions

Conceptualization: FB (lead), MLS (colead)
Supervision: CH, KS
Funding acquisition: FB, AS, KS, MLS, MM, MK, HN
Investigation: AS, MB, MM, CS (supporting contributions from DK and CW)
Formal analysis: CS, HN, DK
Writing – original draft: CS, HN
Writing – review & editing: MLS, MK, AT, AS, MB, MM, CH, KS
All authors reviewed the final manuscript.

Conflicts of Interest

CS, DK, AT, KS, CW and CH have reported no conflicts of interest.
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MB reports grants from Thermo Fisher BRAHMS, and Roche Diagnostics outside the submitted work.
MK invests in ETFs that hold shares of various companies in the technology and health care sectors, and holds stocks in organizations that do not gain financially from the publication of this manuscript but might do so in the future;
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Multimedia Appendix 1

Interview guide for the AkuSym interview study.
[PDF File (Adobe File), 98 KB-Multimedia Appendix 1]

Multimedia Appendix 2

Codebook for the AkuSym interview study.
[PDF File (Adobe File), 200 KB-Multimedia Appendix 2]

Multimedia Appendix 3

Selected quotes from the AkuSym interview study.
[PDF File (Adobe File), 102 KB-Multimedia Appendix 3]

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Abbreviations

COREQ: Consolidated Criteria for Reporting Qualitative Research
ED: emergency department
RCT: randomized controlled trial
SAA: symptom assessment app
SMASS: Swiss Medical Assessment System
SmED: Structured Initial Medical Assessment in Germany
SRQR: Standards for Reporting Qualitative Research

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