Improving children's patient experience with a mobile hospital clowning application – Initial user experiences from the clowns' perspective

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Abstract

eHealth solutions are increasingly being developed to support patient care and improve patients' experiences (PXs). Recently, the coronavirus disease 2019 (COVID-19) pandemic and the shortage of nurses in several countries, including Finland, have further underscored the need for new digital services. In the context of children's hospitals, care-supporting services include hospital clowns who work to provide emotional support for children and improve their PXs. Hospital clowns are known to have a positive impact on children's PX.

The Finnish hospital clown organization Sairaalaklovnit ry has published its first mobile application *Sairaalaklovnit* to provide a digital contact platform to reach patients remotely via messages. The application is mainly targeted at child patients and includes both entertainment and messaging facets for communication between child patients and hospital clowns. The two main user groups for this application can be considered to be child patients and hospital clowns.

This article presents the data and results found during a study related to the user experience (UX) of the *Sairaalaklovnit* application. With the research questions, "Which aspects influence the UX of the hospital clown application?" and more specifically, out of the two user groups, "How do Finnish hospital clowns experience the new hospital clown mobile application?", this study aims to gain an understanding of how Finnish hospital clowns experience the newly developed application for expanding physical contact with patients into a digital form. The qualitative data used in this article were collected in the summer of 2022 through an online questionnaire (n = 5) and semi-structured interviews (n = 3) with hospital clowns.

The hospital clowns were mostly satisfied with the published application, but some deficiencies were mentioned. Most of the complaints were related to technical issues. However, the application was seen as a useful tool that can bridge physical and digital contact with children. The developer has been made aware of the technical issues and fixes expected in the future. For future research, it can be beneficial to rerun the UX study for the hospital clowns and possibly with a larger sample to see whether there have

been any changes after the technical issues have been solved. Moreover, studying how child patients, which constitute the other user group, experience the new application, can prove to be beneficial for possible future development.

Introduction

Healthcare organizations strive to provide high-quality care and support patients' needs [1]. In addition, they have acknowledged that the perceived quality of care is strongly influenced by the patients' experience (PX) [1–3]. At the same time, several countries need to solve how to continue providing these services as they face a shortage of nurses [4]. According to the World Health Organization, digital health services for improving PX should be considered as they can provide access to quality health services globally [5]. While digital health services can provide new types of services for patients, they can also improve the efficiency and cost-effectiveness of care [5].

PX has become an emerging concept that has gained significant attention. Although little is known about the PX of child patients and their families, some studies about the PX of children and teens in a hospital context can be found. The focus of these studies has been on the treatment of outpatients [6], experiences of hospitalization [7–11], elements of children's PX [12], development of a PX questionnaire for the context of children's hospital [13,14], and the design and use of digital services for child patients and their families [15–17].

Among healthcare professionals, hospital clowns also interact with child patients and their families in children's hospitals. Hospital clowns, commonly referred to as medical clowns or clown doctors, are performers working in a hospital setting to alleviate the fears or stress of the patients [18]. In particular, children can experience stress or anxiety that can be caused not only by their medical condition but possibly by being separated from their family and being in an unfamiliar situation. In these situations, hospital clowns work to provide emotional support and improve the PX using different performing arts [19,20]. Previous studies have shown that the presence of clowns can reduce the stress levels in children during invasive procedures, such as cannulation [21–23].

The coronavirus disease 2019 (COVID-19) pandemic and the lockdown have encouraged hospital clowns to think of new ways to interact with and support child patients in a safe way. Traditional hospital clowning happens in live contact with patients within the hospital premises. However, hospital clowning can also be performed in a digital form. Digital hospital clowning usually has the goal of deepening the interaction between clowns and patients outside of the live contacts. In some European hospital clown organizations, child patients are met and entertained through remote performances via live streams or posted videos [24]. In Finland, digital hospital clowning has mostly been video calls with individual patients [25]. In the Netherlands, hospital clowns have developed a unique mobile application for providing entertainment and communicating with children. The CliniClowns App enables the Dutch hospital clowns to host video calls with patients, have live streams with the audience interacting with the performance, and initiate a text chat to communicate with patients [26].

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A mobile hospital clowning application can be considered as an example of a digital healthcare-related service that aims to have an impact on improving PX, is used in a hospital context, and has two distinct end-user groups, in which user needs toward and user experience (UX) of the service vary. According to the principles of human-centered design [27], both user groups need to be involved in the design and evaluation activities of the interactive service to achieve high usability and UX. This article introduces a case study of such a service: the hospital clowns' experiences of a mobile hospital clowning application recently developed in Finland.

In Finland, hospital clowning is provided by a non-profit organization called Sairaalaklovnit ry, the Finnish Hospital Clowns Association. Hospital clowning is mainly offered on a weekly basis in the five university hospital cities around Finland [28]. The new hospital clowning mobile application is targeted at child users, but it is freely downloadable by anyone. In addition to the freely usable videos and podcasts, the app includes a locked messaging feature that is reserved for patients who wish to communicate with hospital clowns remotely. The messaging feature, called Balloon mail, is opened with a specific QR code distributed by the hospital clowns visiting the hospitals. The application currently has Finnish and Swedish language options. The application was introduced to the hospital clown organization in May 2022.

This research is conducted as a qualitative case study to better understand how a new digital form of the hospital clown service affects the work of the hospital clowns with child patients. Furthermore, this study aims to gain an understanding of how the hospital clowns experience the newly developed digital application and its introduction within the Finnish hospital clown organization. The research

questions were as follows: "Which aspects influence the UX of the hospital clown application?" and "How do Finnish hospital clowns experience the new hospital clown mobile application?"

Material and methods

In this case study, we applied a qualitative approach to better understand the UX of the hospital clowns' digital service. This study focused on the viewpoint of the hospital clowns. The data-gathering methods included semi-structured interviews and online questionnaires.

The semi-structured interviews were conducted remotely in August 2022 by the first author. The initial goal was to interview five out of the approximately 20 people working as hospital clowns in Finnish hospitals; however, only three hospital clowns were interested in taking part in the study. All three interviewees were working full-time as hospital clowns in different university hospitals around Finland. In addition, they had used the new hospital clowning application at least once before the interviews. One had also taken part in the application's development process and had tested the application prototypes before the application was published.

The interviews included 23 questions (see Appendix A) related to the background of the interviewees, how introducing the new application affected their daily work, their experiences with the published application, and possible suggestions for the application's future development. The interviews were held in Finnish, lasted between 30–45 minutes, and recorded with the consent of the interviewees.

An online questionnaire was also published to supplement the interview and collect further UX and insights from more participants. The online questionnaire was shared with the hospital clown

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organization on two occasions, once in June and once in August 2022, and a total of five responses were collected. The questionnaire was available for all hospital clowns. However, as it was anonymous, it cannot be verified whether the interviewees had also responded to the questionnaire. In addition, four more people opened the questionnaire form and began answering the questions but did not submit the questionnaire. The questions were similar to the ones presented in the interviews but in a more condensed form. The questionnaire was also in Finnish. Moreover, the online questionnaire included a set of standardized usability-related Usability Metric for User Experience (UMUX)-Lite [29] questions. The UMUX-Lite questionnaire was chosen because it only includes two questions, and the UMUX-Lite score is comparable with the widely used System Usability Scale (SUS) score [29,30]. The questionnaire is presented in Appendix B. Only two out of five respondents responded to the first two questions about how much the introduction of the app has affected the amount of their work and how the introduction has affected the content of their work. Given the few respondents, this part of the data was not analyzed.

The interviews were voice recorded and transcribed. Thematic analysis [31–33] was utilized in analyzing the interview data. The first author conducted the analysis with guidance from the second author. The analysis started with coding the transcripts. Afterward, the codes were categorized under main categories and subcategories to recognize the emerging themes related to the research questions.

The questionnaire data were automatically analyzed by the Webropol platform. The figures and graphs created by the platform aided the researcher in interpreting the responses. In addition, the UMUX-Lite questions were analyzed according to the guidelines, resulting in a score between 0–100 and converted into a SUS-comparable score [34]. The answers to the open-ended questions were combined and the main points were gathered.

Results

The results were divided into four themes: application usage, UX of the service, development ideas, and survey results.

Application usage

All of the interviewees had used the application as part of their daily tasks in hospital clowning. Checking the application for new messages at least once a day was everyone's responsibility; hence, everyone had allocated some time for using the application. The application was mainly used on either the individuals' work phones or with the phone shared with the whole hospital clown team. This was mentioned to allow hospital clowns to differentiate work and personal phone usage easier as there was no temptation to check the messages outside of working hours. As the interviewees used the application as part of their work, they mentioned that they rarely or never used the entertainment features without face-to-face contact with children even though the messaging feature was used to upkeep remote contact with patients.

The interviewees were not able to tell whether the application had an effect on the physical contact with child patients or if the hospital clowns were perceived as more approachable than before. However, according to one interviewee, it had been reported that children seemed to have become more familiar with hospital clowning in general after using the application. With some children, it was also noticed how the written stories in the messages had carried over to physical contact, showing that the application had reached its goal of bridging

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digital and physical contacts. Interviewees also mentioned that they had used or heard other clowns using the application during the contacts with children and one interviewee gave an example of messages talking about eating ice cream and how the same discussion had continued when the clown pair visited the child in the hospital. In the questionnaire's free-form feedback question, some comments were given about how the application has been a joyful addition to the clowns for use in contacting the children.

UX of the service

All interviewees considered the messaging feature, called Balloon mail, as the main part of the application because it provided a means of communication between the hospital clowns and patients. According to Interviewee 1, *"Balloon mail, as a feature, is the main thing in the application because it helps create a connection [with children]. It continues or builds the foundation for future contacts [at the hospital]."* However, the messaging feature included major technical issues. Interviewee 2 pointed out, *"The issue with Balloon mail is that you can never be certain that the message has really been delivered."* The topic of technical issues was clearly present in the questionnaire as well. Three out of the five respondents answered the questionnaire's free-form feedback question and mentioned their annoyance of technical issues affecting their work and use of the application. Practical examples were given to support or justify the clowns' annoyance caused by these issues.

All interviewees mentioned the technical challenges in using the application. In addition to the messaging feature, different types of technical issues were noticed in other features, such as creating one's own profile card. For example, an Android-specific issue with some visual elements' alignment was noticed. These elements were not

aligned as well as in the iOS version, causing annoyance toward this specific feature. This issue was also observed in the questionnaire, where two out of the five respondents listed creating profile cards as one of their least favorite features. Two out of the three interviewees presented their concerns related to the effects of technical issues on the UX of the application. One interviewee mentioned that they are worried that these issues will mitigate the child users' excitement toward the application.

Concerning the positive aspects of the application, the interviewees listed their favorite features within the application. The starting view was mentioned as one of the favorite features by all interviewees. It was seen as appealing and seemed to work flawlessly. It was also mentioned in the questionnaire by two out of the five respondents as one of their favorite features. One interviewee mentioned that its visual look represents the whole application and the hospital clown organization really well. The animations and interactivity in this view were liked by the hospital clowns. One interviewee mentioned that it seemed that children liked it as well. The messaging feature was also listed as a favorite because it offered a new way to contact patients despite its issues. In the questionnaire, the messaging feature was the most liked feature by the respondents (n = 3/5).

Development ideas

When discussing possible future development ideas for new features, the interviewees listed some, including live streaming of hospital clown content, a game to introduce hospital spaces and procedures, and video calls between clowns and patients. All the suggestions can be categorized under three themes: interaction, entertainment, and guidance (see Table 1).

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Usability and usefulness ratings

Based on the questionnaire responses, all respondents had used the application as part of their daily tasks. All five replied to the two UMUX-Lite questions about the application's usability and usefulness (see Table 2). The average score for the first statement "The hospital clown application's features met my requirements" was 3.0 (on a five-point Likert scale from 1 = strongly disagree to 5 = strongly agree) and for the second statement "The hospital clown application is easy to use" was 4.4. Based on these, the calculated average UMUX-Lite score for the application was 67.5 (on a scale of 0–100).

Table 1. Future feature suggestions from the interviewees.

Theme	Suggestion
Interaction	Live streaming hospital clown content
	Video calls with children
Entertainment	Mobile game with hospital clown characters
	Play guides or instructions for playing
Guidance	Exploring the hospital floor plan
	Introducing different medical procedures in a fun way (step-by-step guides)

Table 2. Survey results concerning the introduction of the mobile hospital clowning application, its usability, and its usefulness.

Question	Average score	Individual scores
UMUX-Lite: The hospital clown application's features met my requirements. (1 = strongly disagree - 5 = strongly agree)	3.0 (n = 5)	2 (n = 2), 3 (n = 1), 4 (n = 2)
UMUX-Lite: The hospital clown application is easy to use. (1 = strongly disagree - 5 = strongly agree)	4.4 (n = 5)	4 (n = 3), 5 (n = 2)
UMUX-Lite: Average score (0–100)	67.5 (n = 5)	50 (n = 2), 62.5 (n = 1), 87.5 (n = 2)

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Discussion

As PX has risen to consciousness and its effect on the perceived quality of care has been noticed [1–3], more attention has been allocated to digital services for improving children's PX [14–15]. In addition to healthcare professionals, hospital clowns interact with children and affect their experiences in hospital environments [16]. In this study, a qualitative research approach was applied to investigate the initial UX of a recently launched mobile hospital clowning application from the clowns' perspective. The study aimed to identify which aspects influence the UX of the hospital clown application, particularly how the Finnish hospital clowns experience the new hospital clown mobile application.

The developed application was adopted into use, and the hospital clowns were generally content with it. For child users, the application offers different types of entertainment and information related to hospital clowns, in addition to sending and receiving personal messages. Sometimes, as part of face-to-face contact and play, the entertainment features can be used together with the children. However, these entertainment features were rarely or never used by the hospital clowns independently without the child contact.

According to the hospital clowns, messaging is the main feature of the application. The hospital clowns were content with the concept of having remote personal messaging with the children. However, hospital clowns use the application only at work. The messaging feature can be considered as a type of solution to answering the children's need for communication channels [15] and ways to alleviate their fears [6]. However, in its current state, the feature has various technical issues that hinder or prevent the sending of messages. For the hospital clowns, these issues are an annoyance they need to cope with and fear that child users may lose their excitement toward the application when facing such problems.

The survey results indicated an average usability and usefulness score of 67.5 for the application, which refers to an average SUS score on a scale of 0–100 [32–33]. As a reference, the evaluated system's SUS score should be above 80.3 to get into the top 10 % of the calculated SUS scores [33]. This result means that there is still room for improvement [32–33] even though the application is working for its intended purpose. It should be noted that with such a small sample size (n = 5), the SUS score might not be as meaningful as it could be with a bigger sample.

Regardless of the technical issues, the hospital clowns have begun using the application as part of their daily tasks and given it positive feedback. The application has been noticed to bridge digital and live contacts with patients, and the stories carry over from messages into physical play. It was mentioned that the hospital clowns are excited to use the application and gain a new level of intimacy with patients by sending and receiving personal messages. Furthermore, suggestions of new features by the hospital clowns included new ways to interact with children, such as live-streaming hospital content and video calls, entertaining hospital clown-themed games, and guidance on hospital premises and medical procedures via the application.

These findings are valuable as it could be considered that this type of application can be a solution for COVID-19-type pandemics or other situations where hospital clowns cannot visit the hospitals in a traditional manner but need to reach the patients remotely, as discussed in the publication [23] related to the European hospital clown organizations' operations during the COVID-19 pandemic. Other hospital clown organizations can also benefit from

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having a digital platform for remote hospital clowning with patients.

The findings from this study underline the importance of digital healthcare-related services with high technical quality and the impact of experienced technical challenges on the overall UX. The studied application was recently launched, targeted toward child patients to support their communication with hospital clowns. From the clowns' perspective, the messaging feature was one of the key features of the new digital application. However, the feature has severe technical issues. The UX of the application from the child patients' viewpoint has not yet been investigated. Having such a vulnerable end-user group, it would be even more important to guarantee the application's technical quality, high usability, and engaging UX before it is introduced and implemented for wider use.

Limitations of the study

Our qualitative research had a very limited number of participants, which can be considered the main limitation of the study. However, there are only about 25 hospital clowns in total in Finnish hospital districts. Out of the five Finnish university hospitals, clowns from three different hospitals around Finland were interviewed. This study on the initial experiences of the recently launched application aimed at a sample of five interviewees and up to 15 respondents for the questionnaire. However, these goals were not met, mostly due to the timing of the data-gathering challenges related to the summer holiday period.

The questionnaire was marketed in two of the organization's internal weekly newsletters in June and August 2022. Nine respondents had opened the questionnaire link and even started answering the questions, but only five had submitted the filled out form. The assumption for people leaving the

questionnaire unanswered was that the first questions were related to the experiences of the development process and introduction of the application. Only a handful of hospital clowns had taken part in the development process; thus, it might have caused people to think that the questionnaire is not intended for them if they had not been part of the development process at any point. In the questionnaire design, it should be considered whether these development related questions should be given to clowns at all as the majority of the application users did not participate in the development process. The small number of hospital clowns around Finland might also cause respondents to hesitate participating in the questionnaire and study due to fears related to anonymity and possible community pressure. The hospital clowns in the Helsinki university hospital had a full break in their activities from June to August 2022; hence, there were fewer clowns using the application at that time, which may have caused them to skip the questionnaire completely even if they had received the link. The data-gathering period was limited to a few months. The data could not be gathered before June as the application's development was delayed on multiple occasions and was published in May instead of February 2022. The reason for not continuing the data gathering after August was the deadlines for the master's thesis this study was part of, as the data were to be gathered before September 2022.

During this study, a version of the validated UMUX-Lite questionnaire with five-point Likert scale statements was implemented in the online questionnaire. The questionnaire was open from June to August 2022 and the responses were analyzed in late August. At the time of the questionnaire, the application still included the technical difficulties that were also mentioned during the interviews with the hospital clowns. The technical issues may have

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affected the average UMUX-Lite score calculated from the responses. As recommended for the UMUX-Lite questionnaire [28], repeating the UMUX-Lite questionnaire with the same user group and possibly with a greater sampling after the technical issues have been solved could provide a better view of the application's usability. Given that the questionnaire parts related to application's usability are planned for use with child users in the future and to ensure that the two user groups' UMUX-Lite scores can be comparable, the simpler UMUX-Lite questionnaire was chosen over the UMUX questionnaire to make it easier for the younger respondents to answer the questionnaire.

Future research

To combat the frustrations caused by technical issues, the application requires some updates in the future. Based on the interviews with the hospital clowns, the developer is aware of the issues, and fixes are already underway. Thus, time will tell how reliably the future hospital clowning application will function and what it looks like. One of the interviewees mentioned that in case the application would be developed further, they would like to have an ideation round with the whole organization that includes the 25 hospital clowns so that all the hospital clowns using the application can voice their ideas and opinions even without actively taking part in the development process and meetings. Further research can be conducted to follow the development process of the application, including the possible implementation of the new features mentioned as future feature suggestions in the study and improvements in the UX of hospital clowns.

Given that the application is mainly targeted at child patients, the design and development of the application could have benefitted from having children take part in the development process as, for example, testers when interactive prototypes of the application were produced. As mentioned previously, in human-centered design principles, including users in the design and evaluation activities can enhance the usability and UX of the finished system [26]. In the future, it is important to study how the application meets the needs and expectations of child patients and to ensure that the application is usable by children.

Furthermore, this study did not consider the effects of the new application on the hospital clown organization on everyday work. Studies related to the effects of introducing a new application in performance-based work with child patients can provide an understanding on how this type of work can be digitized.

Conclusions

The research objective for this study was to understand how the hospital clowns, as one user group, experience the newly developed hospital clowning mobile application, which aims at supporting and improving the PX of child patients. To answer the research question, a qualitative research approach utilizing semi-structured interviews and an online questionnaire was conducted with Finnish hospital clowns.

The hospital clowns were content with the application and its features. However, their initial experiences of use indicate that the application's usability and UX are affected by technical issues that include but are not limited to the ones that complicate the use of the main function and messaging between hospital clowns and child patients. Based on the results, the usability of the recently launched application seemed to be on an average level. Improvement suggestions included both bug fixes and ideas for new features that can be added to the application to provide new digital ways to interact with children. In addition, the clowns suggested that the

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mobile application could include entertainment and guidance for navigating the hospitals and preparing for medical procedures.

Based on the findings, mobile hospital clowning application may have the potential to expand physical contact with patients into a digital form and provide new ways for the clowns to give emotional support for children and improve their PX. However, it is important to guarantee that the application, used in the healthcare context with child patients, has high quality and usability for both main user groups, namely, the hospital clowns and the child patients, to have a pleasant UX.

Conflict of interest statement

The authors declare no conflict of interest.

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Appendices

Appendix A. Interview questions.

* Optional questions to deepen the answer to the previous question.

No.	The English translation of the question	The goal of the question
1	How long have you worked as a hospital clown?	Interviewee's background
2	Do you work as a hospital clown in a specific hospital, or do you visit multiple hospitals?	Interviewee's background
2*	How often do you visit a hospital as a hospital clown? (Daily, weekly, monthly)	Interviewee's background
3	As a hospital clown, do you focus more on contact with children, or do you meet other patients in the hospital?	Interviewee's background
4	How would you describe an average workday as a hospital clown?	Interviewee's background
4*	What types of units do you visit? Do you only visit wards, or do you visit intensive care units and surgeries too?	Interviewee's background
5	Who do you meet in the hospital (e.g., child patients, parents, adult patients, etc.)?	Interviewee's background
6	Have you taken part in the development of the hospital clown application (e.g., by joining the meetings between hospital clowns and the development team, writing in the Slack channel, or offering ideas or wishes)?	Participation in the app development
6*	What kind of role did you have in the development project?	Participation in the app development
6*	Did you feel that your participation influenced the development of the application? Why?	Participation in the app development
6*	How did you experience the communication and interaction between the hospital clowns and the development team?	Participation in the app development
6*	Is there anything you would like to change in the development process if the project was started from scratch?	Participation in the app development

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No.	The English translation of the question	The goal of the question
7	Do you think the introduction of the application within the organization was sufficiently informed?	Introduction of the app within the organization
8	Was the introduction of the application guided (e.g., did you receive written or oral instructions on how to install and use the application)?	Introduction of the app within the organization
9	Are you aware of who is responsible for maintaining and updating the application (e.g., who is responsible for uploading videos, podcast episodes, or clown cards into the application)?	Responsibilities within the organization
10	Do you have any responsibilities related to maintaining or updating the application?	The app's effect on the work
11	Have you taken the usage of the application as part of your work tasks as a clown?	The app's effect on the work
12	Do you use the application on your own device or does your team have a shared device for using the application?	The app's effect on the work
13	What for do you use the application in your work?	The app's effect on the work
14	How often do you use the application?	The app's effect on the work
15	Have you noticed that the usage of the application affects the clown's work (e.g., do the clowns use the app during the contacts with children, or do the children talk about the app) (or give feedback during the contacts)?	The app's effect on the work
16	Have you experienced that the app influences the interaction between you and the children (e.g., are the children more willing to take contact)?	The app's effect on the work
17	How do you experience the application in general (e.g., is it simple or are there challenges)?	The user experience of the application
18	What other app features have you used?	The user experience of the application
19	How was your experience with the Balloon mail/messaging feature?	The user experience of the application

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No.	The English translation of the question	The goal of the question
20	What app features are you satisfied with?	The user experience of the application
20*	Why?	The user experience of the application
21	What app features are you dissatisfied with?	The user experience of the application
21*	Why?	The user experience of the application
22	Is there something you would like to add to the application? Why?	Future development ideas
22*	Is there something you would like to remove from the application? Why?	Future development ideas
23	If the application will be developed further, what are your wishes for the future development process? E.g., weekly meetings.	Future development ideas

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Appendix B. Questionnaire questions.

* Questions are only shown to the respondent if they had answered "Yes" to the previous question.

No.	Type of the question	The English translation of the question	The goal of the question
1	Multiple choices (choose one)	Have you ever taken part in any other software development projects before the hospital clown app's development? Yes No I don't know	Respondent's experience in software development
2	Multiple choices (choose one)	Have you been actively participating in the development of the hospital clown application? (E.g., setting requirements for the application or affecting the development's direction in any other way) Yes* No	Respondent's experience in software development
2*	Rating scale 1-10	Rate the app's development process as a whole on a scale of 1–10. (1= I am completely disappointed in the process – 10 = The process has exceeded my expectations)	Respondent's experience in software development
3	Multiple choices (choose one)	Have you participated in a discussion related to the app's development? (E.g., the meetings with the development team or conversations on Slack) Yes* No I don't know	Respondent's participation in discussions
3*	Multiple choices (choose any)	What channels have you used for app development-related discussion? Email Slack or other chat platforms Google Meets or other remote meeting platforms Face-to-face meetings Traditional phone calls Other, specify:	Respondent's participation in discussions
3*	Rating scale 1-10	How suitable were these channels as discussion channels? (1 = Not suitable at all – 10 = Extremely suitable)	Respondent's participation in discussions
4	Multiple choices (choose one)	Have you used the hospital clown app as part of your work as a clown? Yes	Introduction of the app

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No.	Type of the question	The English translation of the question	The goal of the question
		No	
5	Multiple choices (choose one)	Has the introduction of the app within the hospital clown organization affected the amount of your work? Yes* No I don't know	Introduction of the app
5*	Rating scale 1-10	How much has the introduction of the app affected the amount of your work? (1 = Significantly reduced – 10 = Significantly increased)	Introduction of the app
6	Multiple choices (choose one)	Has the introduction of the app affected the content of your work? Yes* No I don't know	Introduction of the app
6*	Rating scale 1-10	How has the introduction of the app affected the content of your work? (1 = Only a slight effect – 10 = Significantly affected)	Introduction of the app
7	Likert scale (5-point)	The hospital clown app's features met my requirements (1 = Strongly disagree – 5 = Strongly agree)	UMUX-Lite question
7	Likert scale (5-point)	The hospital clown app is easy to use (1 = Strongly disagree – 5 = Strongly agree)	UMUX-Lite question
8	Textbox	What are the three features of the hospital clown app that you are most satisfied with?	Features
9	Textbox	What are the three features of the hospital clown app that you are most dissatisfied with?	Features
10	Textbox	General feedback	General feedback