Jurnal Kesehatan dr. Soebandi
ISSN : 2302-7932 (Print)
ISSN : 2527-7529 (OnLine)

The Usability Study Of A Newly Developed Mobile Application Guided Imagery In Indonesian (GIANESIA) For Anxiety In Preoperative Patients

Ina Martiana[1*], Achmad Sya`id[2]
[1,2] Faculty of Health Science, Universitas dr. Soebandi, Jember, East Java, Indonesia
*Corespondence Author : martiana.im@gmail.com

ABSTRACT

Introduction: Patients were commonly feel anxiety before surgical procedure. The anxiety caused by the lack of knowledge or experience in the surgical procedure or safety threats. Guided imagery was a therapy using imagination to overcome the anxiety. Most of the similar apps were provide in English, none in Indonesian language. So, the built of therapy app in Indonesian verse might be more helpful for Indonesians. **Objective:** The aim of this study was to evaluate a mobile app 'guided imagery in Indonesian (GIANESIA)' for ease of providing therapy to patients. **Methods:** This study was a quantitative study using descriptive analytical. A total of 6 experts and 41 users were participated in this study. A consecutive sampling with criteria inclusion such as age above 18 and have preoperative procedure was used in this study. The experts were given a form to evaluate and users were given a modified questionnaire of system usability scale (SUS). **Results:** The results shows 97.6% of users was satisfied using the app (mean+SD=83+15.69). All of experts were considered the language in therapy, the appearance of the app, the ease of use, and the content were good. The experts gave suggestions for unseen buttons, lack of information for scoring, unbalanced audio, and confusing in satisfaction message. This GIANESIA app was useful for users with total SUS score >68 which means this app can be used for wider audience. 83.3% of the experts also conclude high satisfaction score >68, so the app and the therapy deserves to be implemented in preoperative patients. **Conclusion:** This application can be the latest breakthrough to support nursing interventions to make it easier for Indonesia nurses to work. The application improvements need to be made for better quality.

ABSTRAK

Latar belakang: *Pasien dengan rencana operasi seringkali merasa cemas. Kecemasan yang muncul disebabkan kurangnya pengetahuan dan pengalaman tentang prosedur operasi atau adanya ancaman keselamatan. Terapi guided imagery atau imajinasi terbimbing merupakan terapi menggunakan imajinasi untuk mengurangi kecemasan. Kebanyakan aplikasi serupa menyediakan terapi menggunakan bahasa Inggris, dan tidak ada yang berbahasa Indonesia. Membangun terapi ini berbahasa Indonesia akan sangat bermanfaat untuk pengguna.* ***Tujuan:*** *untuk mengevaluasi aplikasi GIANESIA (Guided Imagery berbahasa Indonesia) untuk menyediakan terapi yang bermanfaat untuk pasien.* ***Metode:*** *Penelitian ini merupakan penelitian kuantitatif menggunakan analisis deskriptif. Total responden terdiri dari 6 ekspert dan 41 pengguna atau pasien. Teknik sampling consecutive sampling dengan kriteria seperti usia >18 tahun dan memiliki rencana operasi. Para ekspert mengevaluasi aplikasi ini menggunakan form yang terdiri dari 5 aspek penilaian yaitu bahasa, penampilan, kemudahan penggunaan, isi konten terapi, dan kepuasan penggunaan. Sedangkan para pengguna/ pasien menilai mengunakan system usability scale (SUS).* ***Hasil:*** *Hasil yang didapatkan yaitu 97.6% pengguna merasa puas dengan aplikasi ini (mean + SD=83 + 15.69). Semua ekspert menyatakan 4 aspek sangat bagus. Adapun beberapa kekurangan yang dinilai yaitu tombol yang tidak terlihat jelas, kurangnya informasi tentang skor, suara tidak seimbang, dan pengisian aspek kepuasan penggunaan membingungkan. Total skor SUS >68 yakni aplikasi ini dapat digunakan ke pengguna yang lebih luas. 83.3% dari ekspert juga menyatakan kepuasan yang tinggi dengan skor >68 dan aplikasi bisa diimplementasikan ke pasien pre-operatif.* ***Kesimpulan:*** *Aplikasi ini bisa menjadi inovasi baru untuk mendukung intervensi keperawatan yang lebih mudah. Pengembangan lebih dalam lagi untuk aplikasi ini sangat dibutuhkan untuk mencapai kualitas yang lebih baik.*

Submission : 06-09-2022

Revised : 02-03-2022

Accepted : 05-04-2022

Kata Kunci *: Kecemasan, gianesia, guided imagery, and aplikasi*

Keywords **:** anxiety, gianesia, guided imagery, and mobile app

Doi : 10.36858/jkds.v10i1.326

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Introduction:

Surgical procedure has emerged psychological and physical response. Negative psychological states such as stress, anxiety, and depression during preoperative were significantly associated with postoperative complications. It may also affect immune response and surgical outcomes (Villa et al., 2020). Anxiety is a common condition in patient preoperative. Patient anxiety related to surgical procedures and safety threats during the surgical process (Digiulio et al., 2014). Anxiety can increase risk of morbidity by affecting physical condition. It caused increase of heart rate, respiratory rate, and blood pressure (Arifuddin & Nur, 2018)

The development of health apps has growth. The latest estimate was 318,000 mobile health apps based on IQVIA Institute for Human Data Science (Aitken et al., 2017). Several studies have used smartphone to reduce anxiety. Many mobile app were built to overcome the anxiety. But, none of them is in Indonesian. In order to make the intervention easier to use and can be understand easily by the patients, Guided Imagery in Indonesian (GIANESIA) has released. A non-pharmacological therapy such as guided imagery can be used for decreasing anxiety. Guided imagery is a mind-body therapy which using imagination by create the sensory perception to feel relaxed, peaceful, and happy (Alex, 2020).

The previous study has determine effectiveness of the meditation therapy using mobile apps (Huberty et al., 2019). It proves if therapy by mobile apps has same effectiveness with direct therapy. Guided imagery apps, might give the same effect as direct. The guided imagery therapy was given by voice instruction with low tone also nature music in the background to bring the atmosphere. From the previous study, they said that the nature-based guided imagery was more effective for anxiety management interventions than a non-nature based guided imagery. It is possible that nature voice can provide greater set of sensory-perceptual experiences that gave positive responses to decrease anxiety (Bratman, et al, 2015; Nguyen & Brymer, 2018). The guided imagery therapy was an effective nursing intervention to reduce preoperative anxiety and blood cortisol level (Felix et al., 2018). However, most of the apps were using English. This can lead to misunderstandings if they don't understand English. They won't be able to imagine properly according to the therapy orders. So, GIANESIA was a mobile app therapy using Indonesian. In this study, we used a version of the Android app development which featured anxiety numeric scale, audio therapy with nature effects, selection of the voice of audio and theme, and message of satisfaction.

Aims and Objectives

The aim of this study is to test the usability of a newly developed mobile app called Guided Imagery in Indonesian (GIANESIA) for preoperative patients. The study has determined to ensure the correct therapy by audio and the use of the mobile app without errors.

Methods:

The quantitative method with descriptive analytical was used in this study. The test was carried out by the experts and users. This study use heuristic evaluation method which is convenient for the experts and questionnaire for the users.

The experts were nurse practitioners and nurse educators. The patients were preoperative patient in a private hospital. Both the experts and patients were called participants. A convenience sampling technique was used. The criteria inclusion for this study, such as the age was 18 years and above, willingness to participate in this study, having preoperative procedure, and used android smartphone. A study assistant which is a nurse in that hospital find every pre-operative patients and asked them for informed consent to join this study. A total of patients who participate were 41 people. The expert was recruited based on their background and experience. The two experts were nurse specialist who worked in the Hospital. Two of them work in the Hospital as executive nurse. One of them was nursing lecture which

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certified as nurse specialist, and one was nursing lecture with Master degree which had experience in developing apps therapy. A total of 6 experts were participated in this study.

All participants were given informed consent to participate in this study. If they agree, we will give them the link of apps installation. This app was design only for android users. If they can't install it, they can use our device for trial. First, after log in, the users need to fill out score pre-therapy. It used number and face scale to measure anxiety by NVASS (Numeric Visual Analog Anxiety Scale). There was number and face scale modified in the apps, the users can scroll it in accordance with their anxiety feeling. Then, they can choose one of the therapy options. They can listen to it in a range of 5 to 7 minutes. After the therapy section was done, the users were asked the post-therapy score with the same measurement. The users was also been asked for their feeling after therapy by filling out the satisfaction message. Also, they gave their review of using the application with questionnaire of modified system usability scale (SUS). The questionnaire has five scales numbered from 1 to 5 from strongly disagree to strongly agree. Five of the questionnaires were reversed. A total SUS score > 68 means high satisfaction.

Meanwhile, the experts were given form for their reviews. The form consist five domains to evaluate. There were language, appearance, ease of use, content, and satisfaction message. Each will be scoring 1 to 5 from very bad, bad, average, good, and very good. They can also give additional comment. The additional comment can be added subjectively but still accordance with the evaluation form. All of the data was analyzed by descriptive statistics using Statistical Package for the Social Sciences (SPSS). This study was supported by Jember Klinik Hospital and funded by Ministry of Research and Technology. The study was approved by ethic committee with ethical number 043/KEPK/SDS/V/2021.

Table 1. Component of GIANESIA mobile application for preoperative anxiety

Mobile application features	Description
Self-rating anxiety score	Asked the participants "how are you right now?" It also provides scrolling score 1 to 10 to present the anxiety level
Introduction	Provides information about guided imagery, definition and benefit. The therapy's role in decrease the anxiety
Choice of therapy theme	Participants can choose the theme of therapy and voice. For example: there are forest theme with female voice and beach theme with male voice
Play therapy	A section to play the audio of therapy which present minutes, name of narrator, and theme tittle.
Satisfaction message	Participants will be asked their anxiety score after doing therapy from 1 to 10. They will write down their experience of using this app. It also provides box for any suggestion from the participants after experiencing the therapy and the app

Results:

Table 2 shows, all experts were nurse. Some are academic educator and clinician by 50%. Two of the experts were working as a nurse in hospital, two were nurse specialists who work in hospital, and two were nursing educators. 83.3% was in range of age 26-45 years old. As users, mostly was female (63.4%). Users mean age was 36.81 (SD 17.74), with majority between 18 and 25 years old (39%). Majority of the users have last education level in senior high school (39%).

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Table 2. Demographic characteristics of participants

Characteristic	n (%)
Experts (n=6)	
Academic discipline	6 (100)
Nursing science	
Working role	
Academic educator	3 (50)
Clinician	3 (50)
Education	
Nursing specialist	3 (50)
Master in nursing	1 (16.7)
Bachelor in nursing	2 (33.3)
Gender	
Male	3 (50)
Female	3 (50)
Age in years	
26-45 years	5 (83.3)
46-65 years	1 (16.7)
Expert score	
Satisfied	5 (83.3)
Unsatisfied	1 (16.7)
Mean ± SD	85.33 ± 9.00
Users (n=41)	
Gender	
Male	15 (36.6)
Female	26 (63.4)
Age	
18-25 years	16 (39)
26-45 years	13 (31.7)
46-65 years	10 (24.4)
>65 years	2 (4.9)
Mean ± SD	36.81 ± 17.74
Education	
Elementary school	2 (4.9)
Junior high school	4 (9.7)
Senior high school	16 (39)
Diploma	3 (7.3)
Bachelor degree	14 (34.2)
Master degree	2 (4.9)
SUS score	
Satisfied	41 (97.6)
Unsatisfied	1 (2.4)
Mean ± SD	83 ± 15.69

The mean SUS score indicated "satisfactionary" usability. 97.6% users were satisfied with the app. They also gave positive comments. 2.4% user was not satisfied with the app but still give positive comment about the app. Experts who satisfied with the overall look and function of the app was 83.3%. 16.7% expert was not satisfied with the app **(table 2)**.

Experts contributed by filling out the form given and additional comments (n=6). These reports were analyzed based on total score and comments in every feature. Then, it grouped in negative and positive opinion by extracting the most frequently topics. In **figure 1a**, the expert's score for language is 5 which mean 'very good'. Score for appearance is mostly 4='good'. Score for ease of use is 5='very good'. Score for content is mostly 5='very good', and score for satisfaction message is '4'= good. One of the reviewer gave score 2='bad' for satisfaction message because it's hard to send the satisfaction message.

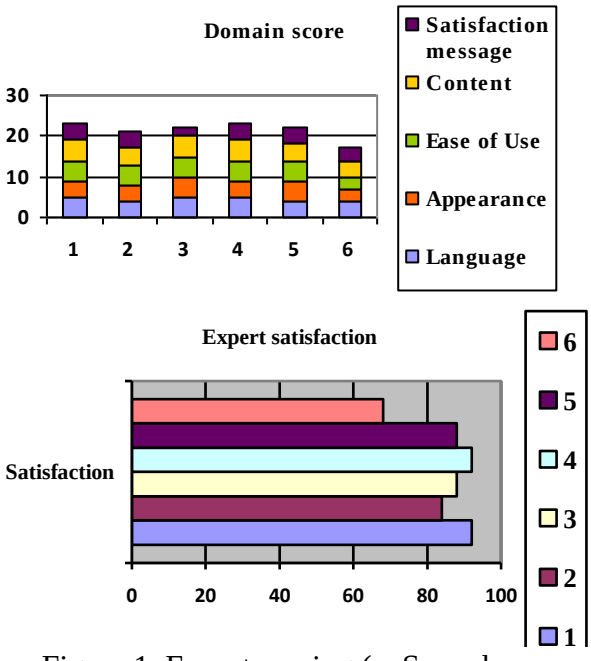

Figure 1. Expert scoring (a. Score by domains; b. Overall satisfaction by each expert)

Not all experts comment in every domain. Regarding the language, most of the comments were good in word's choice. Some

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experts considered the appearance is nice, cute, and calming. All the experts think this app was easy to use. The duration of therapy is enough, but sometimes there is unbalanced voice. All experts considered the satisfaction message was confusing and less information. There were suggestions to improve the content in sound setting, change word's color, more effective button, add information, and added the nature sound **(Table 3)**.

Table 3. Expert critical opinions

Opinion about the app			
Positive	N	Negative	N
The choice of words and intonation was good	3	There is no information about self-rating anxiety score	2
The app is easy to use	4	"Next" button can be replaced with slide	2
The app's appearance is nice. It's soft and calming	3	Sometimes, the narrator's voice is louder than the back sound	3
The word used in the therapy was so imaginative	2	Less information to fill the final score. It's confusing	5
The duration of therapy is enough	2	The introduction's word color is not clear	2
		Previous button can't be seen	2
		Hard to submit satisfaction message	2
		The nature back sound effect can be added more	1

Discussion:

Anxiety is a common feeling for preoperative patient (Pritchard, 2009). GIANESIA app can be used as non-pharmacological nursing intervention. As such, usability study will make the app stronger to be implemented. The usability study also important for developmental process and ensure the efficient and effectiveness of the app.

From the results above, most of the users were in age range between 18 – 25 years old. Mostly were female. Most of the users and experts were satisfied with the therapy in GIANESIA. It shows that the guided imagery inside the app was compatible in any gender. This findings, aligns with the literature that the effectiveness result of guided imagery didn't depend on gender (Nguyen, J., & Brymer, E., 2018).

The language, content, and ease of use had high score from users and experts. This might be because it had Indonesian language for the therapy. The menu is easy to use and click. Before the therapies did the recording, the words has been checked and the intonation also been considered well. But, there was still unbalanced audio as well. The narrator's audio sometimes louder than the nature voice. It happened because the lack of recording's tool and skill for voice editing. It was confusing in final score and satisfaction message because there was less information how to fill it. It needs more trial to develop the effective design of the appearance, so people can understand it easily.

Besides that, the app also contain relaxing therapy with good intonation and imaginative. The positive comments indicate that this guided imagery therapy inside the app was so useful to give positive effect to the listeners. Some were said to add the duration. It shows how meaningful and impactful this guided imagery inside GIANESIA app. It similar with the enthusiasm from the previous study which state that health-related mobile apps are increasingly popular (Bol et al., 2018). People like the benefit and ease of use the app just by downloading it in Play Store for android or others (Luna-Perejon et al., 2019).

Through the development of GIANESIA mobile app, nurses will find it easier to give guided imagery as their nursing intervention. It takes shorter time, lighten the workload, and improve excellent service. The usability study is hoped for successful development of mobile web-based intervention which can enhance the preoperative patients. This paper makes

valuable contribution in improving health and wellbeing of the patients, evidence base for other mobile health apps, and innovation in practice for researchers, educators, and clinicians.

Conslusion:

The app has a good usability. Each feature has positive and negative side. The users and experts were satisfied with the app and the therapy guided imagery inside the app. The therapy brings positive effect for all the listeners. They feel pleased and hope for more duration of the therapy and another suggestion for development. Even though it still has lack in the features or appearance, the app will be upgraded in a better quality and content based on this usability study. There was a limitation of this study. This app must be reviewed by an expert from the technology field to see the app from the whole side. So it can compete with another app in the future.

Acknowledgement:

I would like to thanks the experts who given their time to review the app. They are Ns. Edianto, S.Kep., M.Kep., Sp.Kep.MB., Ns. Fakrul Ardiansyah, S.Kep., M.Kep., Sp.Kep.MB.; Ns Hendra Dwi Cahyono, S.Kep., M.Kep.; Ns. Yeni Fuspita, S.Kep., M.Kep.; Ns. Lenny Infil Sakinah, S.Kep., and Ns. Nurul Ardlian, S.Kep.

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