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Bens-App (Benson relaxation Application) for Reducing Side Effects of Chemotherapy among Breast Cancer Patients: Development and Usability Study

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Abstract

Background: Chemotherapy's effects decrease the quality of life in breast cancer patients. Smartphone apps are ready to deliver Benson's relaxation program. **Objective**: This study aimed to develop and assess the usefulness of the "Bens-App *(Benson's relaxation application)"* for breast cancer patients. **Methods**: The study included 28 breast cancer patients in Baladhika Husada Hospital in Jember. Indonesia. Developed the application in several stages (1) literature review to determine the content, (2) the application feasibility test carried out by 2 experts in medical surgical nursing and oncology. Performed usability tests after the patient had used *Bens-App* for 7 days. The mHealth App Usability Questionnaire (MAUQ) was used to measure usability. **Results**: *Bens-App* contains 6 features (1) health information about breast cancer, Benson's relaxation, and fatigue (2) Benson's relaxation guide using audio (3) "reminder" reminds patients to perform Benson relaxation twice/day (4) self-monitoring which in graphical form on the home page, (5) documentation via the web to observe patient activity with the Bens-App. Usability tests results show 3 items get the highest average MAUQ score, "I will use this application again" (6.5/7), "Applications that are useful for health and me" (6.5/7), "Applications improve my access to health services" (6.5/7) and the lowest average score on the item" I can use the application when the internet network is poor or unavailable" (5.28/7). **Conclusion**; Bens-App can be received well, although some items still need improvement. Further research in larger populations is required.

Keywords: chemotherapy; breast cancer; mobile app; benson's relaxation.

INTRODUCTION

Breast cancer is one of the types of cancer with the highest prevalence and mortality in women (1). In 2018, there were 2089 new breast cancer cases (2).

Chemotherapy is one of the main treatments for breast cancer patients, which has some side effects such as alopecia, pain, nausea, vomiting, sleep disturbances, and fatigue (1). These side effects result in decreased functional capacity, reduced quality of life, and decreased patient life expectancy (3). Research by Ai, Gao, Zheng, & Lu (2018) suggests that patients' quality of life is one of the key indicators of cancer treatment success. Combining regimens is one way to increase the effectiveness of anticancer drugs and reduce the side effects of chemotherapy; one method is using TACs (docetaxel, doxorubicin, and cyclophosphamide) which are widely used in breast cancer patients (3).

Currently, non-pharmacological therapies have been widely used to overcome chemotherapy's side effects and have positive impacts on patients, such as relaxation therapy, reflexology, and music therapy (5). Benson's relaxation technique is one technique that is easy to perform by influencing patients' mental and emotional status (Benson 1957 (6). Benson relaxation can inhibit the activation of the sympathetic nervous system and reduce a patient's body metabolism so that the body will become more comfortable and relaxed (Rambod et al., 2014).

The use of applications in the health sector is one of the innovations which can help patients interact with health workers, provide access to health information media for patients, make the process of collecting patient data faster and more practical, and provide an opportunity to observe the patient's condition so that it can improve the quality of health services for patients (9). This is demonstrated by research by Oriana Ciani (2019), suggesting that smartphone applications can improve the self-management of cancer patients. The systematic review by Dale et al. (2015) shows that smartphone applications have an important role in changing patients' health behavior and managing cardiovascular diseases.

Combining Benson's relaxation with the use of information technology is one strategic step in overcoming the fatigue felt by breast cancer patients. This is also supported by the high number of internet users in Indonesia, which cannot be separated from the fast development of cellular phones. In 2018, it was recorded that 88.46 percent of people in Indonesia had at least one mobile phone number (11).

OBJECTIVE

This study aims to develop and evaluate the usability of "*Bens-App*" (Benson's relaxation application) for breast cancer patients undergoing chemotherapy.

METHODS

This study uses a quantitative approach to evaluate whether this application is viable by conducting a 7-day trial on breast cancer patients undergoing chemotherapy at Baladhika Husada Hospital, Jember, East Java, Indonesia.

Sample size and sampling technique

The research sample included 28 breast cancer patients undergoing chemotherapy at Baladhika Husada Hospital, Jember. The inclusion criteria in this study were breast cancer patients aged> 18 years, having a smartphone, being able to communicate and understand the Indonesian language well, and undergoing chemotherapy at least the 2nd cycle with a pain scale <7.

The instrument for data collection

The Health App Usability Questionnaire (MAUQ) is used to measure the application's usability. This questionnaire was developed by Zhou, Bao, Setiawan, Saptono, & Parmanto (2019) and consists of 18 question items that can measure the usability of an application using a Likert scale from 1 to 7, with 1 representing strongly disagrees and 7 representing strongly agree. The items measured include ease of use and comfort in learning, application interface, application navigation, clarity of information, suitability

with patients' needs, amount of time needed for using the app, willingness to use repeatedly, application satisfaction, application usefulness, use of internet networks, ease of access to information, and the impact on patient's health or condition.

Procedures

The development of this application is done through several stages.

1. Studying the literature to compile the content of the application
2. Consultation with experts or lecturers in determining the intervention used and health information included in the application to help patients. Two experts in palliative care for cancer were included in this stage;
3. Consultation and process of making Bens app with programmers
4. Assessment and evaluation by 28 patients with breast cancer to view content, display applications, use of language, and application functions. The researchers used the mHealth App Usability Questionnaire (MAUQ) to evaluate the app.

Ethical consideration

This research has passed the ethical test conducted by the Universitas Indonesia, the Faculty of Nursing Number SK-76/UN2.F12.D1.2.I/ETIK.2020

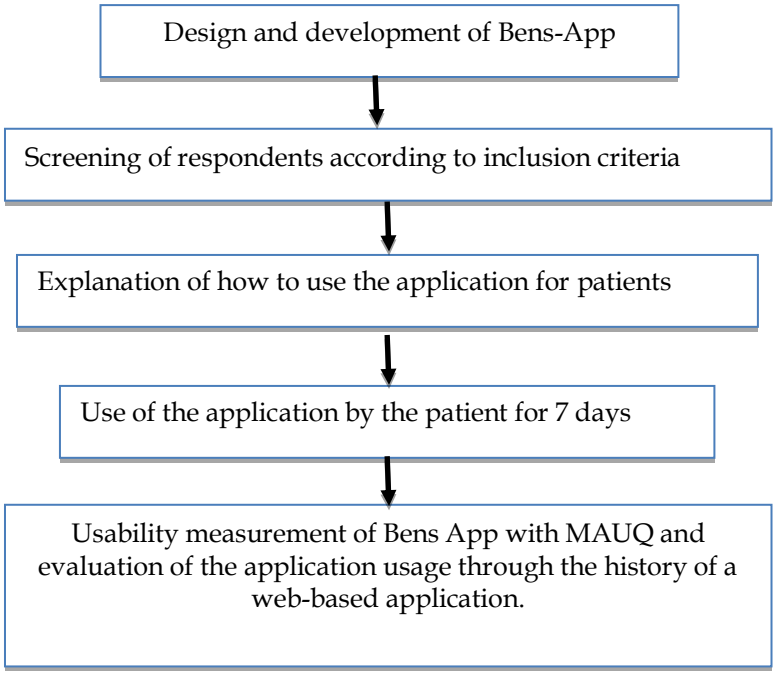

Figure 1. Flow chart Usability testing

RESULTS

Based on the characteristics of the research respondents, as shown in table 1, the mean age of the respondents is 49 years, with a range of 33 to 60 years. Most of the patients had a low level of education (78.6%), the frequency of chemotherapy was ≤6 times (78.6%), the majority of the cancer stage was at stage III (82.1%), and the duration of suffering from cancer was mostly 1-3 years (46.4%).

Table 1. Characteristics of respondents (n = 28)

Characteristics	Category	Frequency	
		n	%
Frequency of Chemotherapy	≤ 6	22	78.6
	> 6	6	21.4
Level of Education	Low	22	78.6
	High	6	21.4
	< 1 year	9	32.1
	1-3 years	13	46.4
Duration of suffering Cancer	> 3 years	6	21.4
	Stage II	3	10.7
Stage of cancer	Stage III	23	82.1
	Stage IV	2	7.1

Benson relaxation application has 5 features that can be used by patients (figure 2), namely (1) health information about breast cancer, chemotherapy, relaxation, and fatigue, (2) a Benson relaxation guide using audio, (3) a "reminder" that gives notifications to patients through the application about what to do (Benson relaxation 2 times/day, health education), (4) the "self-monitoring" feature which is presented as a graph containing the patient's condition, (5) documentation of the patient's history of using the smartphone application.

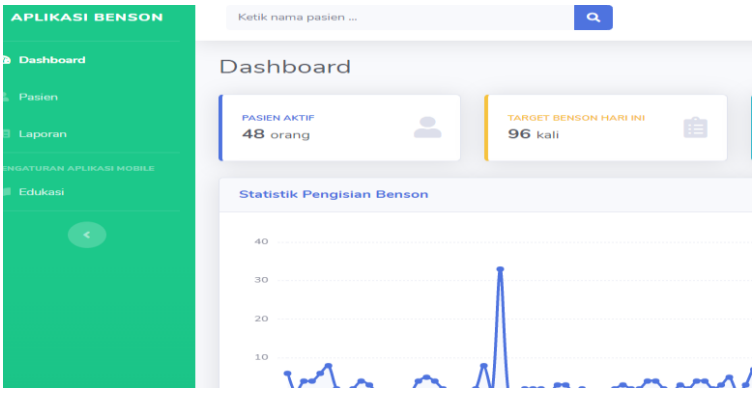

Figure 1. *Bens-App* features and Documentation in the web-based application

The results of the usability measurements carried out using the MAUQ questionnaire, shown in table 3, show the highest average value on the 3 statement items, which are: "I am willing to use this application again" (6.5 / 7), "This application is useful for my health and wellness" (6.5 / 7), "This applications increases my access to health services" (6.5 / 7). Meanwhile, the 3 items with the lowest average score were as follows: "I can use the application when the internet network is not good or not available" (5.28 / 7), and "The navigation is consistent when moving between screens" (5.92 / 7). "I like the application's look" (5.96 / 7). Based on application usage data obtained from the *Bens-App* web application, almost all patients (89%) continuously open the application and listen to Benson relaxation every day for 7 days.

Table 2: *The Mhealth App Usability Questionnaire* (MAUQ)

No.	Statement	Mean
1	The app was easy to use	6.17
2	It was easy for me to learn to use the app.	6.14
3	The navigation was consistent when moving between screens.	5.92
4	The app's interface allowed me to use all the functions (such as entering information, responding to reminders, and viewing information).	6.17
5	Whenever I made a mistake using the app, I could quickly recover.	6.00
6	I like the interface of the app.	5.96
7	The information in the app was well organized, so I could easily find the information I needed.	6.03
8	The app adequately acknowledged and provided information to let me know the progress of my action.	6.00
9	I feel comfortable using this app in social settings.	6.00
10	The amount of time involved in using this app has fitted for me	6.17
11	I would use this app again	6.50
12	Overall, I am satisfied with this app	6.25
13	The app would be useful for my health and well-being.	6.50
14	The app improved my access to healthcare services.	6.50
15	The app helped me manage my health effectively	6.42
16	This app has all the functions and capabilities I expected it to have.	6.17
17	I could use the app even when the Internet connection was poor or unavailable.	5.28
18	This mHealth app provides an acceptable way to receive healthcare services, such as accessing educational materials, tracking my activities, and performing self-assessment	6.21

DISCUSSION

*Bens-App*s is one of the first mobile health applications developed to assist and facilitate patients in performing Benson relaxation therapy in breast cancer patients. The selection of Benson relaxation as one of the main focuses in this application is based on several considerations: ease of treatment, short time required, no cost, and the positive impact it shows. Several studies demonstrate this, one of which is the research of Heidari Gorji, et., al. (2014), which indicated that Benson relaxation performed by patients 2 times a day for 4 weeks was proven to significantly reduce the perception of pain, stress, and anxiety in CKD

patients who performed hemodialysis. The same result is shown by the research of Soheili et al. (2019), showing a significant reduction in

anxiety, stress, and depression in 75 multiple sclerosis patients after doing Benson relaxation and reflexology for 4 weeks.

The 5 features of the *Bens-App* are integrated features designed to increase patients' knowledge by providing health education according to the patient's condition,

then providing a Benson relaxation guide using audio to facilitate and increase the patients' independence in performing Benson relaxation.

Cancer is a disease that requires a long treatment and care, especially in patients undergoing chemotherapy. Research by Junghaenel et al. (2015) shows that chemotherapy side effects are the worst condition during the first week after providing chemotherapy drugs. In this condition, many patients experience chemotherapy's side effects, especially when at home with their family. With the *Bens-App*, it is expected that patients' knowledge will increase, and the patients can perform Benson relaxation independently to help reduce the impact of chemotherapy felt by the patients. However, in its implementation, supervision by nurses is still needed to facilitate and help patients deal with problems that arise due to chemotherapy.

The analysis of the MAUQ questionnaire table and the history of the application indicate that almost all patients open the *Bens-App* > 2 times a day. This shows that *Bens-App* can be accepted and used appropriately by patients. Limitations of this study include the relatively short time to use the application and the use of the application, which requires internet access.

Conclusion

Bens-App is one of the first mobile health applications which contains Benson relaxation therapy. This application is well accepted by breast cancer patients who are undergoing chemotherapy, even though some items have not yet been of maximum value and the use of the application requires supervision and guidance from nurses so that *Bens-App* can properly facilitate patients in dealing with the side effects of chemotherapy felt by the patients. In addition, further research is needed to identify the effectiveness of *Bens-App*, especially compared to other interventions.

Conflict of Interest

The authors declare no potential conflicts of interest for the research. Authorship and publication of this article

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REFERENCES

1. Marques VA, Ferreira-junior JB, Lemos TV, Moraes RF. E ff ects of Chemotherapy Treatment on Muscle Strength , Quality of Life , Fatigue , and Anxiety in Women with Breast Cancer. 2020;1–10.
2. Globocan Observatory 2019 WI, (IARC) IA for R on C, (WHO) WHO. Breast Cancer. Source: Globocan 2018. World Heal Organ Int Agency Res Cancer. 2019;876:2018–9.
3. Mackey JR, Martin M, Pienkowski T, Rolski J, Guastalla JP, Sami A, et al. Adjuvant docetaxel, doxorubicin, and cyclophosphamide in node-positive breast cancer: 10-year follow-up of the phase 3 randomised BCIRG 001 trial. Lancet Oncol. 2013;14(1):72–80.
4. Ai Z, Gao X, Zheng S, Lu C. Variability and Influencing Factors of QOL in Breast Cancer Patients Having Chemotherapy. 2018;2012(25):1–16.
5. Dikmen HA, Terzioglu F. Pain Management Nursing Effects of Re fl exology and Progressive Muscle Relaxation on Pain , Fatigue , and Quality of Life during Chemotherapy in Gynecologic Cancer Patients. Pain Manag Nurs. 2018;(xxxx):1–7.
6. Poorolajal J, Ashtarani F, Alimohammadi N. Effect of Benson relaxation technique on the preoperative anxiety and hemodynamic status: A single blind randomized clinical trial. Artery Res [Internet]. 2017;17:33–8. Available from: http://dx.doi.org/10.1016/j.artres.2017.01.002
7. Soheili M, Nazari F, Shaygannejad V, Valiani M. A comparison the effects of reflexology and relaxation on the psychological symptoms in women with multiple sclerosis. J Educ Health Promot. 2019;8:1–11.

8. Jafari H, Janati Y, Yazdani J, Bali N, Hassanpour S. The Effect of Relaxation Technique on Fatigue Levels after Stem Cell Transplant. Iran J Nurs Midwifery Res. 2018;23(5):388–94.
9. Kayyali R, Peletidi A, Ismail M, Hashim Z, Bandeira P, Bonnah J. Awareness and Use of mHealth Apps: A Study from England. Pharmacy. 2017;5(2):33.
10. Pfaeffli Dale L, Dobson R, Whittaker R, Maddison R. The effectiveness of mobile-health behaviour change interventions for cardiovascular disease self-management: A systematic review. Eur J Prev Cardiol. 2015;23(8):801–17.
11. BPS. Statistik Telekomunikasi Indonesia 2018. ©Badan Pus Stat Jakarta – Indones. 2018;
12. Zhou L, Bao J, Setiawan IMA, Saptono A, Parmanto B. The mhealth app usability questionnaire (MAUQ): Development and validation study. JMIR mHealth uHealth. 2019;7(4):1–15.
13. Heidari Gorji MA, Davanloo A, Heidarigorji AM. The efficacy of relaxation training on stress, anxiety, and pain perception in hemodialysis patients. Indian J Nephrol. 2014;24(6):356–61.
14. Junghaenel DU, Cohen J, Schneider S, Neerukonda AR, Broderick JE. Identification of distinct fatigue trajectories in patients with breast cancer undergoing adjuvant chemotherapy. Support Care Cancer. 2015;23(9):2579–87.