

Feasibility Evaluation of an Android-based Nutrition App (Dietducate) among Nutritionists using the User Version of The Mobile Apps Rating Scale (uMARS)

by Muhammad Iqbal

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Feasibility Evaluation of an Android-based Nutrition App (Dietducate) among Nutritionists using the User Version of The Mobile Apps Rating Scale (uMARS)

Muhammad Iqbal 1*, Elita Dwi Nurrahmawati 2 dan Husin3

1 Politeknik Negeri Jember; iqbalbasagili@polije.ac.id

2 Politeknik Negeri Jember; elitadwin@gmail.com

3 Politeknik Negeri Jember; husin@polije.ac.id

* Correspondence: iqbalbasagili@polije.ac.id

Abstract: Online nutrition consultations are one of the strategic measures utilized to address complex nutritional issues. The use of smartphones in Indonesia is on the rise, particularly smartphones with the Android operating system. Indonesia has entered the 4.0 Industrial Revolution, which involves the application of technology in a variety of fields, including the healthcare industry. One application of this technology is the creation of the android application "dietducate." Using the uMARS (End-User Version of The Mobile Apps Rating Scale) method, this study aims to assess the feasibility of the android-based health application "dietducate" for nutritionists. Utilizing the uMARS research method and a 5-point scale, the research design is quantitative. Using a technique of purposive sampling, up to 35 nutritionists were gathered as subjects. The application evaluation was conducted using the uMARS questionnaire. The results indicated that the application quality score was within the acceptable range (4.05 out of 5). The component outcomes are determined by four supporting factors: involvement, functionality, aesthetics, and information. The results of each score are 3.97, 4.03, 4.02, and 4.23, respectively. It can be concluded that nutritionists can utilize the dietducate application. This app is also regarded as user-friendly and efficient for completing nutritionists' work. However, there are too many advertisements and minor bugs that need fixing to optimize app performance.

Keywords: Nutrition App, Dietducate, Feasibility Evaluation, uMARS.

Abstrak:

Salah satu upaya strategis dalam mengatasi permasalahan gizi yang kompleks ialah melalui konsultasi gizi secara online. Penggunaan smartphone di Indonesia semakin meningkat terutama pada smartphone dengan OS Android. Indonesia telah memasuki revolusi Industri 4.0 yaitu pemanfaatan teknologi di berbagai bidang, termasuk bidang kesehatan. Salah satu bentuk pemanfaatan teknologi ini adalah pengembangan aplikasi android "dietducate". Penelitian ini bertujuan untuk mengevaluasi kelayakan aplikasi kesehatan berbasis android "dietducate" pada ahli gizi menggunakan metode uMARS (End-User Version of The Mobile Apps Rating Scale). Desain penelitian yang digunakan ialah kuantitatif dengan metode penelitian uMARS dengan skala 5 poin. Teknik pengambilan subjek menggunakan teknik purposive sampling sebanyak 35 orang ahli gizi. Aplikasi dievaluasi menggunakan kuesioner uMARS. Hasil penelitian menunjukkan skor kualitas aplikasi dalam kategori baik (4,05/5). Komponen hasil tersebut didapatkan dari 4 aspek menunjang yaitu aspek keterlibatan, fungsionalitas, estetika dan informasi. Adapun hasil skor masing-masing secara berurutan 3,97; 4,03; 4,02; 4,23. Dapat disimpulkan aplikasi dietducate layak digunakan pada

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1 ahli gizi. Aplikasi juga dianggap mudah digunakan dan efektif dalam menyelesaikan pekerjaan ahli 40
gizi. Namun terdapat terlalu banyak iklan dan bug-bug kecil yang perlu diperbaiki untuk me- 41
maksimalkan kinerja aplikasi. 42

Kata kunci: Aplikasi kesehatan, Dietducate, Kelayakan aplikasi, uMARS. 43
44

1. Introduction 45

In parallel with the epidemiological transition, Indonesia's nutritional issues are be- 46
coming increasingly complex. Multiple nutritional issues, including overnutrition and de- 47
generative diseases, are on the rise. The prevalence of non-communicable diseases, such 48
as stroke, cancer, hypertension, diabetes, and chronic kidney disease, has also increased 49
since Riskeudas 2013 (Basic Health Research) [1]. Many causes of nutritional issues 50
are rooted in society's erroneous beliefs, attitudes, and practices. [2] To address these diverse 51
issues, health professionals are required, particularly nutritionists who can contribute to 52
health service efforts[3]. Nutrition education and consultation is one of the strategic ap- 53
proaches used to increase attitude and behavior changes. [2] Nutritionists also serve as 54
educators, extension agents, trainers, and nutrition consultants. [4] In addition, providing 55
nutrition consultations can influence behavior modification. [5] 56

The obstacles encountered in efforts to improve community nutrition require a more 57
innovative and integrated approach from all parties involved. The times have begun to 58
enter the Industrial Revolution 4.0, also known as the digital revolution, which is charac- 59
terized by the use of digital technology in various fields, including the health sector. [6] 60
The use of technology will at least solve geographical, temporal, and socioeconomic is- 61
sues. [7] In addition, the use of smartphones is increasing annually in Indonesia, where 62
there are 338.2 million mobile phone users and 175.4 million internet users, or 64% of the 63
population. [8] Android is the predominant smartphone operating system in Indonesia, 64
accounting for 92.14 percent. [9] 65

According to previous research, the use of smartphone applications as a health pro- 66
motion innovation is feasible [10]. The outcomes of nutrition education via android 67
smartphone media can improve nutritional knowledge, attitudes, and behavior. [11] With 68
online nutrition consultations, nutrition services play an active role in supporting healthy 69
lifestyles and disease prevention efforts. Online nutrition consultations can overcome 70
problems with nutrition services that are more commonly encountered in conventional 71
consultations. [12] It has been suggested that smartphone applications could provide evi- 72
dence-based health information to assist individuals in making more informed decisions 73
regarding diet and exercise. [13] 74

The development of the application "Dietducate" is an example of technological pro- 75
gress. The application is an Android application with a diet consultation function, which 76
analyzes the nutritional value of food and provides nutrition education. AhliGiziID re- 77
leased the dietducate application on the Play Store on January 15, 2020. The dietducate 78
application can be used as a resource to obtain information on how to achieve the ideal 79
body weight, according to previous research. This application can assist in managing 80
healthy and nutritious eating patterns, including weight loss and gain. [14] The results of 81
the study indicate that the dietducate application can be accepted by the greater commu- 82
nity, beginning at the secondary school level and extending to institutions of higher edu- 83
cation. The majority of users are also pleased with the application being developed, as 84
indicated by an average rating of over 80% for usability, satisfaction, and ease of use. [15] 85
According to the average value of system, user, interaction, information, and function as- 86
pects for similar applications, the "NutriHealth" application is user-friendly and can be 87
well received by respondents, based on the findings of other studies. [16] 88

However, there is currently no feasibility test for nutritionists using the dietucate application. It is essential to conduct an application feasibility test to determine whether the application can be utilized in accordance with the requirements of users, particularly nutritionists. Engagement and functionality are application design elements that influence the user's intent to continue using the application. [17-18] Recently popular uMARS (end-user of version Mobile App Rating Scale) is one of the tools used to evaluate the feasibility of an application. uMARS is a straightforward, objective, and reliable tool for evaluating the quality of mobile health applications. On a 5-point scale, uMARS rates the dimensions of engagement, functionality, aesthetics, information, and subjective quality (1. Poor - 5. Very Good). [19] uMARS provides a more comprehensive evaluation than any other app quality metric. [20] uMARS is one of the most widely used app evaluation tools ever developed. [21] In addition, consumers and researchers can utilize the uMARS scale with ease. [17] The authors are interested in further investigating the feasibility evaluation of the android-based health application "dietucate" for nutritionists using the uMARS (end-user of version Mobile) method in light of the aforementioned issues. App Score Scale).

2. Materials and Methods

The quantitative uMARS research method is utilized for the quantitative research design. On a 5-point scale, uMARS evaluates the dimensions of engagement, functionality, aesthetics, information, and subjective quality in health applications. Purposive sampling technique for obtaining samples of subjects. This study's inclusion criteria required nutritionists to be willing to complete questionnaires, utilize the dietucate application, and have Internet access. In the meantime, nutritionists who used the dietucate application for more than one day were excluded.

This study's data collection occurred in June 2021. 52 individuals completed the questionnaire, but only 35 met the inclusion requirements. Using the uMARS questionnaire is the method for collecting research data. Through social media, the uMARS questionnaire was distributed online. Prior to completing the questionnaire, respondents were instructed to utilize the dietucate application for 10 minutes to optimize results. Using a five-point Likert scale, the uMARS questionnaire evaluates four application categories: user engagement, functionality, aesthetics, and information accuracy. The sum of the scores for each category yields an overall objective and subjective quality score. 19 meanwhile, descriptive analysis is used for data analysis.

3. Results

This research was conducted online by distributing questionnaires through social media (WhatsApp, Telegram and Instagram) to get respondents. In June 2021, the distribution of the questionnaire took place. 52 individuals completed the questionnaire, but only 35 met the criteria for inclusion. In this study, participants provide informed consent and complete the uMARS questionnaire via an online form. Before filling out the questionnaire, respondents were asked to use the dietucate application first for ± 10 minutes.

3.1. Characteristics of Respondents

Table 1. distribution and frequency of respondents

No	Variable	Total (n=35)	%
1	Gender		
	Male	2	5,7
	Female	33	94,3
2	Length of using Dietducate		
	1-7 Days	3	8,5
	2-3 weeks	3	8,5

1-6 months	12	34,2
7-12 months	5	14,2
> 1 year	12	34,2

According to Table 1, 94.2% of the 35 respondents were female. The respondents who used the application the longest were those who had done so for 1-6 months and > 1 year with the same percentage, 34.2%. On the other hand, only 3 individuals (8.5%) used Dietducate for 1-7 days, which was the same number and percentage of respondents as those who used the application for 2-3 weeks.

3.2. uMARS Score

Table 2. Test reliability of the user version of the Mobile App Rating Scale

No	Subscale/Item	Score
1	Engagement	3,97
	Entertainment	3,82
	Interest	4,2
	Customization	4,03
	Interactivity	3,4
2	Target group	4,42
	Functionality	4,03
	Performance	3,94
	Ease of use	4,1
3	Navigation	3,94
	Gestural design	4,14
	Aesthetics	4
4	Layout	4,02
	Graphics	3,88
	Visual appeal	4,1
	Information	4,23
5	Quality of Information	4,11
	Quantity of Information	4,17
	Credibility of Source	4,42
6	TOTAL uMARS ^a	4,05
6	Subjective Items	3,74
	Would you recommend	4,28
	How many times	4
	Would you pay	2,4
7	Overall (all) rating	4,31
	Behavior Change	4,2
	Awareness	4,37
	Knowledge	4,42
	Attitude	4,2
	Intention to change	4,02
	Looking for help	4,37
Behavior change	3,97	

^auMARS : user version of the Mobile App Rating Scale for measure Object Quality App

On engagement items. The obtained scores range from 1 to 5, with a mean of 3.97. The engagement score is derived from responses to five questions regarding entertainment, interest, customization, interactivity, and suitability for the application's target audience. With a mean score of 4.42, target group is the favorable rating for the "engagement" subscale. But entertainment received the lowest rating (average 3.82).

Scoring for functionality ranges from 26 1 to 5 (mean 4.03). The functionality score is 145
 compiled from four questions regarding performance, ease of use navigation, and gestural 146
 design. In the Functionality subcategory, gesture design receives the greatest average 147
 score of 4.14. However, performance and navigation received the lowest grade, 3.94. 148

The range of aesthetic scores was between 3 and 5. (mean 4). Aesthetic score compiled 149
 from several aesthetic queries, visual appeal, and graphics. Visual appeal receives the 150
 greatest average score (4.1), while graphics receive the lowest average score (average 3.88). 151

Information scores varied between 3 and 5. (mean 4.23). Three questions comprise 152
 the information score: information quality, information quantity, and source credibility. 153
 Credibility receives a high average score of 4.42 in the information category. However, 154
 information quality receives 27 lowest score (average 4.11). The uMARS score is 4.05 155
 (maximum score = 5) and this score is the average of the scores obtained in the subcatego- 156
 ries Engagement, Functionality, Aesthetics, and Information. 157

Subjective scores varied between 1 and 5. (mean 3.74). The score is based on four 158
 questions regarding the likelihood of recommending the app to others, the frequency of 159
 use within the next 12 months, the probability of paying for the app, and the app's overall 160
 star rating. The question regarding the application's overall star rating provides the great- 161
 est score (average 4.31). While the question regarding the possibility of paying for the 162
 application produces the lowest score (average 2.4). 163

The range of behavior 70 change scores is from 1 to 5. (average 4.2). The score is derived 164
 from questions regarding awareness, knowledge, attitude, intent to change, looking for 165
 help, and behavior change. The highest scores are awarded for questions that increase 166
 knowledge (average 4.42). While questions regarding behavior change yield the lowest 167
 score (average 3.97). 168

4. Discussion 169

The dietducate application is deemed to be of good quality (4.05/5). The evaluation 170
 of application quality is based on the average score of four factors: engagement, function- 171
 ality, aesthetics, and information. Among the four sections evaluated by uMARS, the in- 172
 formation section is the best (4.23/24 This is consistent with the development of the 173
 dietducate application, which aims to make it easier for users to comprehend accurate 174
 information through the use of empirical research. [15] In addition, evidence-based prac- 175
 tice enhances nutritionists' credibility with other members of the healthcare team and 176
 makes their practice more effective and efficient. [22] There is the potential for applica- 177
 tions to provide evidence-based health information to assist users in making better deci- 178
 sions regarding diet and physical activity. [13] In addition, a solid body of evidence can 179
 promote app adoption and enhance user health. [23] 180

Functionality and aesthetic value of the application are rated highly (4.03; 4.02). These 181
 results support the hypothesis that people prefer applications that are functionally sound 182
 and simple to use. [24] User experience/UX is influenced more positively by design ele- 183
 ments such as usability, navigation, graphics, and visual appeal. [25] In addition, the user- 184
 er's intention to continue using the application is influenced by the application's usability. 185
 [26] While other aspects, such as involvement, received nearly satisfactory ratings (3.97/5). 186
 Applications that provide additional interactive features, such as behavioral tracking and 187
 semi-automatic options, that make it easier for users to use the application can increase 188
 engagement, the attractiveness of the application, and the likelihood of repeat use. [20] 189
 [17] 190

The results revealed that the part of the respondents were seasoned users of the 191
 dietducate application. This may be attributable to the application's high-quality score 192
 and positive user reviews praising the application's effectiveness in completing tasks, re- 193
 sulting in the application's continued use. This is also consistent with previous research, 194
 specifically the evaluation of the dietducate application by the general public, in which 195
 the majority of respondents found it to be useful, satisfying, and simple to use. [15] Re- 196

regardless of the quality of the application's content, if it is impractical and difficult for consumers to use, the quality is considered to be poor. [24] User participation can influence the increase in continued use. [27]

The reason for the low average subjective quality score (3.74/5) can be attributed to the low score (2.4/5) on the question "will you pay for this app?" Only two users have expressed a willingness to pay for the app in the future. Applications that are still in their infancy or new should not be charged because they build a reputation for the brand and attract more users. [28-29] Gradually, as application users feel appropriate and suited to their needs. So slowly, applications can be monetized by providing more specialized content, such as protection from advertisements. [30] But before becoming a paid application, it's good to see competitors. If it offers the same features as competitors, but they are free, it is not advised, as you risk losing users. [31]

In addition, users assert that the dietducate application contains an excessive number of advertisements. Advertising in free applications is a natural occurrence, given that the application is free to use and the application developer derives revenue from advertising. [32] However, recent studies show that advertisements have hidden costs in terms of energy, network usage, and performance which can affect the assessment of application quality. [33] If users feel annoyed by advertisements, applications can provide options for users to make in-app purchases. so that the app can run without ads. [34]

5. Conclusions

Evaluation of the feasibility of the dietducate application using the uMARS method obtained good results or was feasible to use. This is evidenced by the application's good quality rating (4.05 out of 5). The component outcomes are determined by four supporting factors: involvement, functionality, aesthetics, and information. The results of each score are 3.97, 4.03, 4.02, and 4.23. The application is also considered effective in completing the work of nutritionists and is easy to use. However, there are some users who find the application's advertisements annoying, and there are minor bugs that need to be resolved. Users also want application developments such as adding data source information and simplifying dietducate formula calculation options.

Nutritionists can use the dietducate application to be effective in completing their work. Application developers can provide in-app payment options (In-App Purchase) to remove in-app advertisements. fixing minor bugs and adding data source information as well as adding the latest features so that they can be updated and keep up with the times. Research is needed with a more representative sample (probability sampling) so that the research results apply to the entire population.

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