



Assessment of User Satisfaction on a HalloBumil Application Through the End User Computing Satisfaction (EUCS) Framework in Semarang (Assessment of User Satisfaction on a HalloBumil)

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Abstract

Mobile health (M-health) applications can enhance maternal health by providing accessible and accurate information. HalloBumil is one of the most widely used maternal health applications in Indonesia, yet few studies have assessed user satisfaction. This study aimed to evaluate user satisfaction with HalloBumil using the End User Computing Satisfaction (EUCS) model. A cross-sectional survey was conducted among pregnant women in Semarang City, with Puskesmas selected through stratified random sampling. Respondents were active HalloBumil users and completed the EUCS questionnaire, which measures five dimensions: Content, Accuracy, Format, Ease of Use, and Timeliness. Data were analyzed descriptively and with correlation tests. Findings indicated that most respondents were satisfied with HalloBumil across all dimensions. Ease of Use achieved the highest score, highlighting that the application is considered intuitive and simple to operate. Timeliness had the lowest score, suggesting a need to improve the delivery of up-to-date and relevant information. Correlation analysis demonstrated significant positive relationships between all EUCS dimensions and overall satisfaction ($p < 0.001$). In conclusion, HalloBumil is generally well-received by pregnant women in Semarang City. These results provide important input for app developers to enhance features, particularly in information timeliness, and for policymakers to optimize digital maternal health services.

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Introduction

Technology plays a vital role in modern life, particularly in health, where digital transformation is rapidly expanding (Legong & Rizki Jatmiko, 2024) (Lukitawati & Novianto, 2023). Pregnant women require special attention, as pregnancy demands intensive monitoring (Dzikria et al., 2022). Mobile health (M-health) applications have emerged as important innovations, enabling women to access health information and monitor pregnancy conditions more independently (Kurniawati et al., 2023). Evidence shows that M-health can effectively promote healthy behaviors and provide accurate, accessible information to support maternal and fetal health (Wulandari et al., 2018) (Puspitasari & Indrianingrum, 2021).

One of the most widely used M-health applications in Indonesia is **HalloBumil**, the first interactive app designed to accompany mothers from pregnancy preparation to childbirth and early child development (HalloBumil, 2024). The application offers features such as a pregnancy timeline and gestational-age-based articles (Rahayu et al., 2020). As of October 2024, HalloBumil has been downloaded more than one million times and received over 19,000 positive reviews with an average rating above 4.0, reflecting user satisfaction with its features, usability, and benefits (Media Komunika Teknologi, 2024; HalloBumil, 2024). Despite some complaints about advertisements, HalloBumil remains valuable and

reliable, with prior studies showing its role in reducing maternal anxiety and fostering user loyalty through information quality and ease of use (Rahayu et al., 2020) (Sari et al., 2023)



Figure 1. Aplikasi HalloBumil

The high maternal mortality rate (MMR) in Indonesia serves as an important background for the use of this application. Based on the 2020 Long Form Population Census, the national MMR reached 189 per 100,000 live births (Badan Pusat Statistik, 2023). In Central Java, there were 189 maternal deaths due to pregnancy complications (Badan Pusat Statistik, 2023). Despite active maternal health programs, maternal mortality remains high in Indonesia, including Semarang City, which recorded 16 maternal deaths in 2023 (Dinas Kesehatan Kota Semarang, 2020; 2023). Limited knowledge of pregnancy risks contributes to these outcomes (Fifi Musfirowati, 2021). Evaluating HalloBumil in Semarang provides valuable insights, as local health contexts influence mHealth adoption.

Methods

This cross-sectional study was conducted among pregnant women in Semarang City. Stratified random sampling was applied to select Puskesmas, and respondents were recruited proportionally from each site. Inclusion criteria were pregnant women who actively used the HalloBumil application.

The research instrument was an adaptation of the End User Computing Satisfaction (EUCS) questionnaire (Doll & Torkzadeh, 1988), covering five dimensions: Content, Accuracy, Format, Ease of Use, and Timeliness. The items were translated and culturally adapted through forward-backward translation and validated by experts in maternal health and digital health. Reliability testing produced Cronbach's alpha values above 0.7 for all dimensions, indicating good internal consistency.

Data analysis included univariate statistics to describe respondent characteristics and response distributions, and bivariate analysis using Spearman correlation to examine relationships between the five EUCS dimensions and user satisfaction, with significance set at $p < 0.05$. The study received ethical approval from the Health Research Ethics Committee of Universitas Dian Nuswantoro (No. 21/EA/KEPK-DINUS/II/2024). The research model (Figure 2) hypothesizes that all five EUCS dimensions influence user satisfaction with the HalloBumil application.

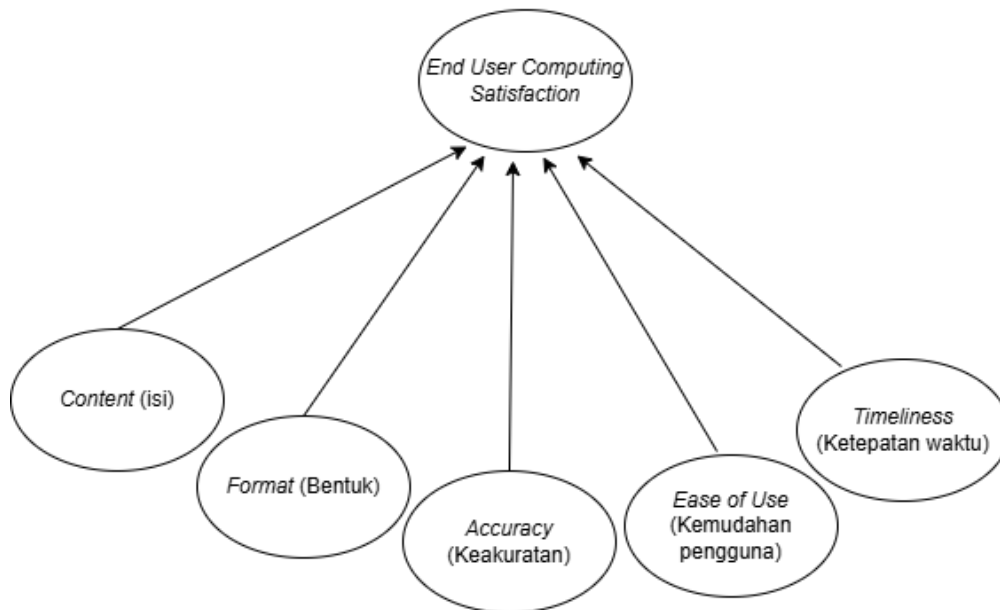


Figure 2. Theoretical Framework of EUCS by Doll and Torkzadeh

Results

The following presents the respondents' characteristics table, which describes the data distribution representing the participants in completing the questionnaire, as shown in Table 11

Table 1. Characteristics of Respondents

Karakteristik Responden	(f)	(%)
Usia		
<19	6	1,5
19-24	86	22,1
>24	298	76,4
Pendidikan terakhir		
SD	10	2,6
SMP	55	14,2
SMA	225	57,7
Perguruan tinggi	100	25,6
Pekerjaan		
Ibu rumah tangga	222	56,9
Karyawan swasta	134	34,4
Wirausaha	27	6,9
Pegawai Negri Sipil(PNS)	4	1,0
Buruh	3	8
Akses informasi kesehatan		
Tenaga kesehatan (Nakes)	289	74,1
Media sosial	98	25,1
Media cetak	2	5
Media elektronik	1	3
Pendapatan		
< Rp3.454.827,00	142	36,4
≥ Rp.3.454.827,00	248	63,6
Total	390	100

The majority of respondents were over 24 years old (76.4%), with only 1.5% under 19 years old. Most had a senior high school education (57.7%), while only 2.6% had elementary education. In terms of occupation, respondents were predominantly housewives (56.9%), followed by private employees

(34.4%). Health information was most frequently obtained from healthcare professionals (74.1%) and least from electronic media (0.3%). Meanwhile, the majority of respondents had a monthly income of $\geq$ Rp3,454,827.00 (63.6%)

Table 2 presents the distribution of respondents' answers across the dimensions of content, accuracy, format, ease of use, timeliness, and satisfaction

Table 1 Distribution of Respondents' Responses

No.	<i>Content</i>	STS		TS		N		S		SS	
		n	%	n	%	n	%	n	%	n	%
1.	Aplikasi HalloBumil menyediakan Konten informasi yang sesuai dengan kebutuhan saya.	1	3	11	2,8	20	5,1	305	78,2	53	13,6
2.	Aplikasi HalloBumil memberikan informasi yang lengkap kepada pengguna.	2	5	14	3,6	30	7,7	240	61,5	104	26,7
3.	Aplikasi HalloBumil memberikan hasil yang dapat memenuhi kebutuhan saya	0	0	16	4,1	42	10,8	250	64,1	82	21,0
4.	Aplikasi HalloBumil dapat memberikan manfaat bagi keperluan kehamilan saya	0	0	6	1,5	21	5,4	258	66,2	105	26,9
5.	Konten yang terdapat didalam aplikasi HalloBumil memiliki kualitas yang baik	0	0	10	2,6	23	5,9	259	66,4	98	25,1
6	Informasi aplikasi HalloBumil sudah sesuai	1	3	6	1,5	49	12,6	235	60,3	99	25,4
Accuracy											
1	Aplikasi HalloBumil menghasilkan informasi yang benar	0	0	7	1,8	35	9,0	247	63,4	101	25,9
2	Informasi yang diberikan HalloBumil akurat dan memberikan informasi yang konsisten	0	0	15	3,8	83	21,3	192	49,2	100	25,6
3	Aplikasi HalloBumil bekerja sesuai dengan standar yang telah ditentukan	0	0	16	4,1	51	13,1	243	62,3	80	20,5
4	Aplikasi HalloBumil menghasilkan informasi yang dapat dipercaya	3	8	4	1,0	58	14,9	238	61,0	87	22,3
Format											
1	Aplikasi HalloBumil memberikan format informasi yang menarik bagi saya	1	3	7	1,8	32	8,2	255	65,4	95	24,4
2	Aplikasi HalloBumil memiliki format informasi yang sudah jelas	0	0	10	2,6	39	10,0	247	63,3	94	24,1
3	Aplikasi HalloBumil menampilkan format informasi yang berkualitas yang baik	1	3	7	1,8	37	9,5	260	66,7	85	21,8
4	Tampilan aplikasi HalloBumil mudah di pahami	0	0	8	2,1	13	3,3	216	55,4	153	39,2
Ease of use											
1	Sistem Aplikasi HalloBumil mudah digunakan	0	0	9	2,3	15	3,8	224	57,4	142	36,4
2	Menu penggunaan aplikasi HalloBumil mudah di pahami	0	0	8	2,1	16	4,1	208	53,3	158	40,5
3	Pengguna Aplikasi HalloBumil nyaman digunakan	1	3	6	1,5	20	5,1	217	55,6	146	37,4
4	Aplikasi HalloBumil dapata digunakan dengan mudah	1	3	7	1,8	17	4,4	204	52,3	161	41,3
5	Aplikasi HalloBumil memberikan kemudahan dalam berkonsultasi dengan	1	3	25	6,4	107	27,4	167	42,8	90	23,1

No.	Content	STS		TS		N		S		SS	
		n	%	n	%	n	%	n	%	n	%
dokter											
Timeliness											
1	Aplikasi HalloBumil menghasilkan informasi terkini	0	0	12	3,1	26	6,7	266	68,2	66	22,1
2	Aplikasi HalloBumil menyediakan informasi yang dapat digunakan oleh pengguna pada waktu tertentu	2	5	6	1,5	31	7,9	260	66,7	91	23,3
3	Aplikasi HalloBumil memberikan informasi yang saya butuhkan secara tepat waktu	2	5	10	2,6	31	7,9	254	65,1	93	23,8
4	Aplikasi Hallobumil memberikan innformasi bantuan kepada pengguna apabila mengalami kendala secara real time	2	5	16	4,1	49	12,6	235	60,3	88	22,6
User											
satisfaction											
1	Aplikasi HalloBumil dapat memenuhi kebutuhan saya dalam menyelesaikan masalah kesehatan	1	3	11	2,8	28	7,2	250	64,1	100	25,6
2	Aplikasi HalloBumil dalam penggunaannya sudah efektif	0	0	9	2,3	29	7,4	238	61,0	114	29,2
3	Aplikasi HalloBumil sudah bekerja secara efisien	1	3	7	1,8	26	6,7	229	58,7	127	32,6
4	Saya merasa puas dengan data dan informasi yang di dapat dari aplikasi HalloBumil	0	0	14	3,6	59	15,1	220	56,4	97	24,9
5	Saya merasa puas dengan cara kerja aplikasi HalloBumil secara menyeluruh	0	0	12	3,1	37	9,5	251	64,4	90	23,1

The analysis in this study was conducted to examine the relationship between the variables Content, Accuracy, Format, Ease of Use, and Timeliness with User Satisfaction in the HalloBumil application.

Tabel 3 The Relationship Between Variable Content, Accuracy, Format, Ease of Use, Timeliness with User Satisfaction (n=390)

Variabel	r	p
<i>Content</i>	0.542	0.000
<i>Accuracy</i>	0.501	0.000
<i>Format</i>	0.429	0.000
<i>Ease of use</i>	0.523	0.000
<i>Timeliness</i>	0.608	0.000

Notes: Spearmen Correlation Test

All dimensions in the End User Computing Satisfaction (EUCS) model have a positive and significant relationship with user satisfaction at a 95% confidence level. Among the five dimensions, Timeliness shows the strongest influence on user satisfaction, with a correlation coefficient of $r = 0.608$. In contrast, the Format dimension demonstrates a relatively weaker influence compared to Content, Accuracy, and Ease of Use.

The results of this study indicate that all EUCS dimensions Content, Accuracy, Format, Ease of Use, and Timeliness are positively and significantly associated with user satisfaction with the HalloBumil application. This finding reflects that the overall quality of the application's components affects user experience and satisfaction, particularly in the context of pregnancy monitoring.

Discussion

The findings of this study demonstrate that HalloBumil is generally well-received by pregnant women in Semarang City. This result is consistent with prior research indicating that M-health applications can improve maternal health outcomes by increasing access to information and support

(Zhao et al., 2016; Chen et al., 2021). In line with the EUCS framework, all five dimensions—Content, Accuracy, Format, Ease of Use, and Timeliness—showed significant positive relationships with user satisfaction.

Content was moderately associated with satisfaction, reflecting the importance of complete, relevant, and understandable information in maternal health applications. Similar results have been reported internationally, where content quality strongly influences trust and sustained use of digital health tools (Alalwan et al., 2017).

Accuracy also showed a moderate positive correlation, underscoring the need for reliable and standardized information. This is consistent with evidence from both Indonesian and global studies that emphasize accuracy as a key determinant of users' trust in health technologies (Zhao et al., 2016; Chen et al., 2021).

Format was positively correlated with satisfaction, indicating that readability, layout, and clarity contribute to a better user experience. Previous studies have similarly highlighted the role of intuitive design in sustaining user engagement (Venkatesh et al., 2012).

Ease of Use was strongly supported by user responses, aligning with prior findings that simple navigation and minimal technical barriers are essential for adoption, particularly among users with varying educational levels (Savira Putri Handasari et al., 2024).

Timeliness emerged as the strongest predictor of satisfaction, showing that up-to-date and responsive information is critical in maternal health. This finding is consistent with evaluations of other M-health applications, where timely notifications and updates were key to effectiveness (Rai riska et al., 2024).

Despite these positive results, several limitations should be noted. First, the cross-sectional design limits the ability to draw causal inferences. Second, reliance on self-reported data may introduce recall and social desirability bias. Third, the sample was limited to one city, reducing generalizability. Future studies should employ longitudinal approaches, incorporate objective usage data, and involve more diverse populations across different regions.

Overall, this study contributes to the growing evidence that maternal M-health applications such as HalloBumil can play a significant role in improving maternal care, while also highlighting areas particularly timeliness and accuracy that require continuous development.

Conclusion

HalloBumil demonstrates strong user satisfaction among pregnant women in Semarang City, particularly in terms of ease of use and information quality. Nonetheless, improvements in the timeliness of information delivery are needed. The findings highlight the importance of user-centered design in M-health applications and provide practical implications for developers and policymakers in enhancing digital maternal health services.

Author Contributions

Mutiara Indah Sari handled the conceptualization of this research, collected and analyzed the data, wrote and translated the article. Respati Wulandari acted as the supervisor, guided the research implementation from beginning to end, and conducted the internal review of the article.

Institutional Review Board Statement

This study was reviewed and approved by the Health Research Ethics Committee of Universitas Dian Nuswantoro, Semarang, Indonesia, with approval number 21/EA/KEPK-DINUS/II/2024. All research procedures were conducted in accordance with applicable research ethics principles, including respect for the rights, privacy, and confidentiality of participants.

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