

ANTECEDENTS OF INTENTION TO ADOPT MOBILE HEALTH (MHEALTH)
APPLICATION FOR PHYSICIANS

Lie Rebecca Yen Hwei, Mustika Ngada Lasiga, Ferdi Antonio, Freda Susana Halim

Universitas Pelita Harapan

ARTICLE INFO

Keywords: telemedicine, continuing medical education, intention to adopt, PLS-SEM**Kata kunci:** elemedicine, pendidikan kedokteran berkelanjutan, niat adopsi, PLS-SEM

Corresponding author:

Lie Rebecca Yen Hwei
rebeccayenhwei@gmail.com

Abstract: Continuing medical education (CME) is a process of getting accreditation for practicing healthcare, in which there is knowledge being “transferred” during the process. With the ongoing pandemic for the last two years, physical distancing made offline symposiums and workshops is practically impossible to hold; hence, necessitating the shift towards electronic-based CME (e-CME). However, there are certain problems associated with using e-CME. Therefore, this study aims to assess factors that may influence physicians' willingness to use mobile applications that provide e-CME in Indonesia. There are 248 respondents for our study with the majority of them are general practitioners, age 21 – 30 years old. Our proposed model is able to explain 62.2% of the variance of perceived usefulness and perceived ease of use explains 54.8% of intention to adopt. Job relevance had the strongest total effects on perceived usefulness ($\beta = 0.353$, $p < 0.001$), followed by perceived ease of use ($\beta = 0.299$, $p < 0.001$). mHealth application that offers e-CME in Indonesia can be used to gain knowledge and assist physicians in daily practice extensively while the application developers may improve certain elements in the application to provide better user experience and safety.

Abstrak: Continuing Medical Education (CME) adalah proses mendapatkan akreditasi untuk praktik kesehatan, di mana ada pengetahuan yang “ditransfer” selama proses tersebut. Dengan pandemi yang sedang berlangsung selama dua tahun terakhir, physical distancing membuat simposium dan lokakarya offline praktis tidak mungkin diadakan; Oleh karena itu, diperlukan pergeseran menuju CME berbasis elektronik (e-CME). Namun, ada masalah tertentu yang terkait dengan penggunaan e-CME. Oleh karena itu, penelitian ini bertujuan untuk mengkaji faktor-faktor yang dapat mempengaruhi kesediaan dokter untuk menggunakan aplikasi mobile yang menyediakan e-CME di Indonesia. Ada 248 responden untuk penelitian kami dengan mayoritas dari mereka adalah dokter umum, usia 21 – 30 tahun. Model yang kami usulkan mampu menjelaskan 62,2% varians kegunaan yang dirasakan dan kegunaan yang dirasakan menjelaskan 54,8% niat untuk mengadopsi. Relevansi pekerjaan memiliki total efek terkuat pada kegunaan yang dirasakan ($\beta = 0,353$, $p < 0,001$), diikuti oleh persepsi kemudahan penggunaan ($\beta = 0,299$, $p < 0,001$). Aplikasi mHealth yang menawarkan e-CME di Indonesia dapat digunakan untuk menambah pengetahuan dan membantu dokter dalam praktik sehari-hari secara luas sementara pengembang aplikasi dapat meningkatkan elemen tertentu dalam aplikasi untuk memberikan pengalaman dan keamanan pengguna yang lebih baik.

INTRODUCTION

Continuing medical education (CME) has no precise definition attached to it. Depending on the context, CME can just simply mean an accreditation process in which doctors and other healthcare professionals need to attend in order to continue their healthcare practices (Davis, 1998). On another note, CME may also be a mode of “knowledge transfer” amongst physicians in order to change or improve their clinical practices (Davis, 1998; Hugenholtz et al., 2008).

There is a lot of purposes of CME to the physicians. Attending CME can bridge the gap between general practitioners (GP) and specialists in terms of communication and knowledge-wise (Thi Nguyen et al., 2021). By doing so, GPs can enhance their clinical knowledge and practice so they can be more confident in handling certain cases that they found difficult or confusing before the CME (Hugenholtz et al., 2008; Nylenna & Aasland, 2007). In less attractive specialties, CME can be a modality to attract and retain specialists that others find disattractive. By significantly improving satisfaction, performance, learning, and specialist recertification, CME motivates doctors to be in the field of less attractive specialties and retain there (Bangdiwala et al., 2010; Honda et al., 2019; Madede et al., 2017). Studies have also shown that CME is useful in terms of upgrading knowledge and translating it to practice, especially if when CME activities are more interactive, employ more different styles of approach to delivering the CME, involve numerous exposures, longer duration, and are focused on outcomes that physicians deem significant (Cervero & Gaines, 2015; Davis et al., 1992).

With the pandemic being one and a half years old, physical interactions are very limited in order to curb the spread of severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2) (Djalante et al., 2020; Haug et al., 2020). Restricted physical interaction also means healthcare professionals are not able to attend CME in person, necessitating a digital shift of CME towards electronic-based CME (e-CME) (Ismail, Abdelkarim, & Al-Hashel, 2021). According to Accreditation Council for Continuing Medical Education (ACCME) report in 2020, the number of learner interactions rose by 22% in comparison to the previous year. The most dominant activity type has also shifted to online learning and internet-based activities from the previous live courses (ACCME, 2020). Through e-CME, there is a way for doctors to share their expertise and knowledge especially in the pandemic era where rapid scientific discoveries are found every day (Narayan, Curran, & Foege, 2021).

However, e-CME is not without any obstacles. Some physicians still prefer classroom training compared to virtual ones (Arizton Advisory & Intelligence, 2021). This particular obstacle is felt even more by the older physicians who have troubles adapting into the digital world (Gravas et al., 2021). Physicians who reside in rural areas might encounter difficulties with internet networks to connect to e-CME properly. In Indonesia, the broadband cable is still unevenly distributed, causing difficulties for physicians who reside in rural areas to access e-CME (Octavius & Antonio, 2021). Furthermore, the steep rise of e-CME inundates physicians to a point where physicians feel overwhelmed by the sheer quantity of e-CME in a day (Ismail et al., 2021). Problems in implementing e-CME might generate dissatisfaction towards existing users. However, for physicians who have yet to try e-CME, there might be a big barrier for them to enter the world of e-CME (Damaske, Walsh, & McKay, 2020; Gravas et al., 2021). Therefore, the aim of this study is to evaluate factors that might affect physicians’ intention to adopt mobile applications that offer e-CME in Indonesia.

THEORITICAL BACKGROUND AND RESEARCH HYPOTHESES

Extended technology acceptance model (TAM2)

The technology acceptance model was proposed by Davis in 1986 as a solution to the lack of measurement scale for predicting user acceptance of technology. It was based on the Theory of Reasoned Action (TRA) by Martin Fishbein and Icek Ajzen in 1975. TAM is a model for user acceptance of information systems that was created particularly for this purpose (Taherdoost, 2018). Perceived usefulness and perceived ease of use are the two primary characteristics that have been proposed as the basic determinants of user approval (Davis, 1989). Venkatesh and Davis proposed TAM1 in a paper about the antecedents of perceived ease of use. The model omitted Attitude that mediated the relationship between perceived usefulness and perceived ease of use in the previous model (Venkatesh & Davis, 1996). The extended technology acceptance model (TAM2) is a theoretical extension of TAM that was developed and tested by Venkatesh and Davis in 2000. TAM2 analyzes perceived usefulness in terms of two external variables, which are social influence processes and cognitive instrumental processes, both of which have been shown to have a substantial impact on user acceptance. Subjective norms (as in TRA), voluntariness, and images are among the social influence processes, whereas the cognitive instrumental process comprises job relevance, output quality, result demonstrability, and perceived ease of use (Venkatesh et al., 2000).

Subjective norm was defined as a person's perception that most people who are important to him think he should or should not perform the behavior in question (Fishbein & Ajzen, 1975; Venkatesh et al., 2000). For this study, we use superior, physician colleagues, and workplace as the source of social norms (Hadadgar et al., 2016). However, we rephrase subjective norm with colleague recommendation as we see it more fitting to the model. Venkatesh and Davis defined job relevance as an individual's perception regarding the degree to which the target system is applicable to his or her job. To put it another way, job relevance is determined by the importance of the set of tasks that the system can enable inside one's work. Result demonstrability was defined as the tangibility of the results of using the innovation. The link between result demonstrability and perceived usefulness is also compatible with the job characteristics model, which stresses awareness of real work results as a fundamental psychological state underpinning work motivation. The original output quality was defined as how individuals would assess how effectively the system does those tasks (Venkatesh et al., 2000). However, for our study, we adapted it to be networking quality because of the features offered by the mHealth application that we use in our country that enable us to add fellow colleagues to expand networking between physicians and to hold an open discussion in the forum inside the application about the unique cases we found in our daily practice (Alomedika, 2021; Gagnon et al., 2006). Therefore, we adapted result quality to networking quality instead to evaluate these features. Perceived benefit has been described in several models from the health belief model the defined perceived benefit as people may choose a specific course of action that would lessen their vulnerability or severity, or lead to other good consequences; to online group buying model (Jones et al., 2015; Tingchi Liu et al., 2013). We adapted perceived benefit as perceived electronic continuing medical education (e-CME) benefit. Telemedicine technologies can be used to provide online continuing medical education (CME) for physicians. It enables the remote delivery of personal health care, continuing medical education, and patient health education, and so provide new approaches to practice medicine (Wang, 2016). COVID-19 pandemic has raised awareness of the potential for technology improvement in medicine and medical education. Online education and training are especially necessary in view

of the pandemic's impending medical demands (Jumreornvong et al., 2020). Thus, we propose the following hypotheses.

- (H1) Colleague recommendation positively influences the perceived usefulness.
- (H2) Job relevance positively influences the perceived usefulness.
- (H3) Result demonstrability positively influences the perceived usefulness.
- (H4) Networking quality positively influences the perceived usefulness.
- (H5) Perceived eCME benefit positively influences the perceived usefulness.

Expectation confirmation theory (ECT)

The expectation confirmation theory has been frequently used to measure consumer satisfaction and repurchase behavior in the field of consumer behavior research (Anderson & Sullivan, 1993; Dabholkar, Shepherd, & Thorpe, 2000; Oliver, 1980, 1993; Patterson, Johnson, & Spreng, 1997; Tse & Wilton, 1988). ECT is a model that resulted from customer satisfaction/dissatisfaction theory (CS/D) modification, which describes information system continuity. Due to numerous theoretical expansions, the newly suggested ECT differed from CS/D. The post-acceptance and post-consumption expectation components are the subjects of expectation-confirmation theory. The change in ex-post expectation, when ECT is provided with felt utility instead of perceived performance, is another theoretical contribution of this paradigm (Bhattacharjee, 2001). ECT has been utilized in a number of studies involving online purchasing or online Web browsing. Koo et al used the ECT model to show the influence of ECT to perceived usefulness in a knowledge-intensive website of the Korean National Cancer Information Center (Koo et al., 2011).

Expectation confirmation, perceived usefulness, satisfaction, and continuation intention are the four key constructs of ECT. The degree to which a user believes that their original expectations are being verified during real use is referred to as confirmation (Bhattacharjee, 2001). Another key element in expectation confirmation theory is perceived usefulness. Venkatesh et al. discovered that perceived usefulness is a stable variable to examine user behavior at both the initial and post-adoption stages. The previous study has shown that expectation confirmation has a substantial impact on perceived usefulness and satisfaction (Venkatesh et al., 2003). Thus, we pose the following hypotheses.

- (H6) Application attractiveness positively influences the knowledge confirmation.
- (H7) Information quality positively influences the knowledge confirmation.
- (H8) Information presentation positively influences the knowledge confirmation.
- (H9) Knowledge confirmation positively influences the perceived usefulness.

Perceived ease of use, perceived usefulness, and intention to adopt

Individual's intention to use, according to TAM, has two major influencing beliefs, which are perceived usefulness and perceived ease of use. Perceived usefulness is the degree to which a person feels that utilizing the system would improve his or her work performance, whereas perceived ease of use is the degree to which a person believes that using the system will be easy. TAM proposed that perceived ease of use also influenced perceived usefulness (Venkatesh et al., 2000). Therefore, we propose the following hypotheses (Figure 1).

- (H10) Perceived ease of use positively influences the perceived usefulness.
- (H11) Perceived usefulness positively influences the intention to adopt mHealth application.

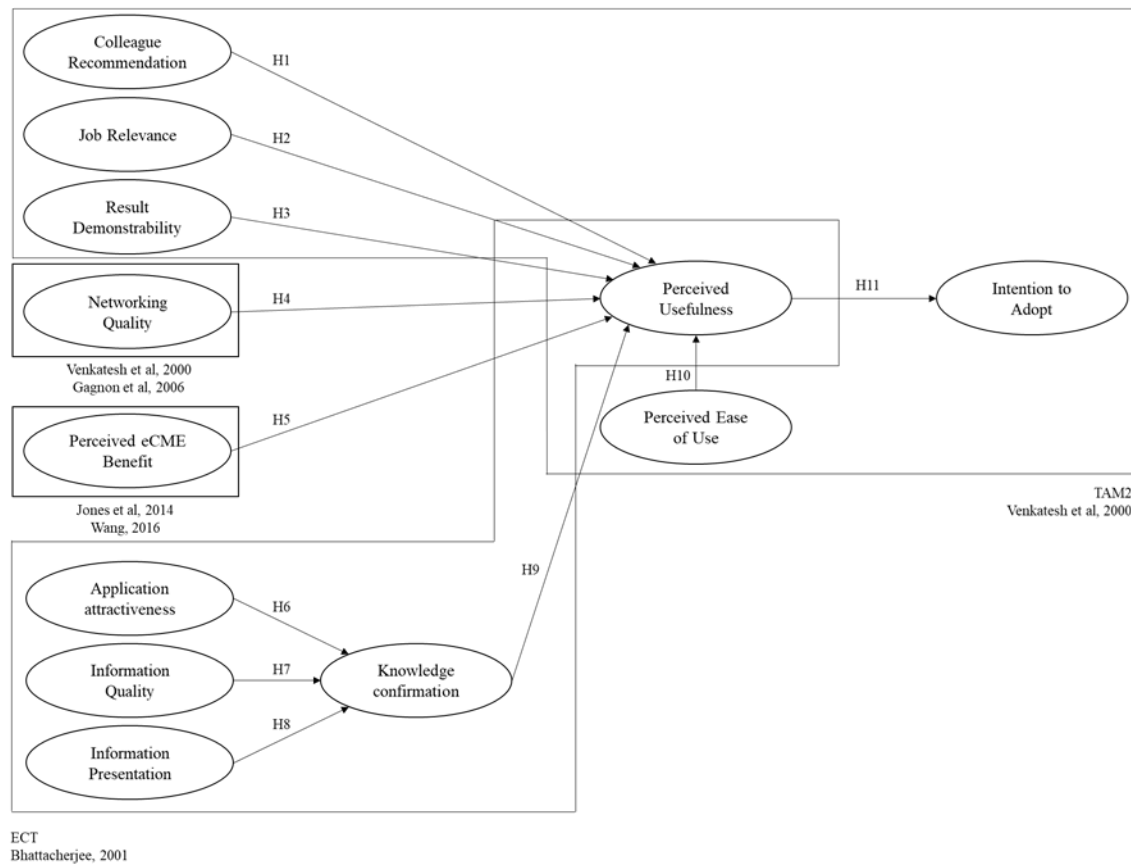


Figure 1. Conceptual model.

METHODS

Questionnaire design and data collection

All of the items used in this study were adopted from prior research regarding the adoption of health information technology with some minor changes (Bhattacharjee, 2001; Gagnon et al., 2006; Hadadgar et al., 2016; Jones et al., 2015; Koo et al., 2011; Venkatesh et al., 2000; Wang, 2016). The items in the questionnaire were first translated from English to Indonesian by a qualified, experienced translator who is fluent in both English and Indonesian. The translated questionnaire was then evaluated by a team of specialists, and minor changes were made to adjust the translation. Backward translation from the amended Indonesian questionnaire to English was completed by another qualified expert translator to ensure that the content retained its original meaning. The data for this study was gathered using a two-part structured questionnaire. Part A provides demographic data, whereas Part B comprises questions that have been previously validated for the various components. The construct's items were graded on a 5-point Likert scale, with response options ranging from (1) "strongly disagree" to (5) "strongly agree."

This study uses a cross-sectional study design with purposive sampling. The inclusion criteria were physicians in Indonesia who had used the mobile health application for physicians at least once in the last 6 months. If they download the application for more than one year and the last time they use the application is more than 6 months, their responses will be excluded. The data were collected from August 8 to August 29, 2021, via Google Forms due to the COVID-19 pandemic. Each email address can only complete the form once.

With a model that meets conventional convergent and discriminant validity evaluation criteria, the complete collinearity test was applied to identify common method bias. For study sample, Ziegel formula (Ziegel et al., 1994) was used with 95% confidence interval and estimated proportion of 0.2; therefore, the minimum sample for this study was 246 samples.

There are four Indonesian mHealth applications for physicians used in this study, which are Alomedika, Halodoc, Docquity, and Doctor to Doctor (D2D). We choose these applications because they are the most popular application used by physicians (Deloitte Indonesia, 2019), especially during the pandemic when offline symposiums and workshops are not available.

Data analysis

Data from the surveys were imported into SmartPLS 3.3 software for statistical analysis using the Structural Equation Modeling (SEM) approach. Structural Equation Modeling (SEM) is a commonly used method for testing the validity of complex theories using empirical data. It is a statistical representation of general linear modeling in its entirety. SEM may be used to investigate relationships between latent constructs that are indicated by several indicators, which is one of its most prominent uses. SEM is made up of two twin model evaluations, which are the measurement model and path model.

A bootstrap of 5,000 subsamples was used to analyze the statistical significance of the final results of the data by means of path coefficients, Cronbach's alpha, Heterotrait-Monotrait Ratio of Correlations (HTMT), and R^2 values. The correlation between latent variables and their indicators was expressed by the outer loading value. All the indicators have an outer loading value of more than 0.7 so that each indicator represents the absolute contribution to the definition of its latent variable. Each construct is reliable and valid based on Cronbach's alpha, composite reliability, and AVE score. Variance Inflation Factor (VIF) was used to examine the collinearity and perceived e-CME benefit is the only latent variable that had a score of higher than 5. R^2 and Q^2 were calculated to evaluate the ability of model prediction.

RESULTS

Sample characteristics

255 responses were obtained; however, due to incomplete answers, 7 responses were excluded from the analysis. The total number of respondents included in this study is 248 participants and the demographic data is shown in Table 1. The majority of the respondents are female, age 21 – 30 years old, residing in Jakarta-Bogor-Depok-Tangerang-Bekasi (Jabodetabek) area. Most of the respondents are a general practitioners and Alomedika is the application of choice for almost half of the respondents. They mostly use the application 0-1 time a week and there is increasing use of the application due to the COVID-19 pandemic.

Table 1. Demographic characteristics of the respondents.

Demographic data	Frequency (%)
Sex	
Male	87 (35.1)
Female	161 (64.9)
Age	
21-30	149 (60.1)
31-40	48 (19.4)
41-50	28 (11.3)
>50	23 (9.3)
Domicile	
Jabodetabek	121 (48.8)
Java Island non-Jabodetabek	58 (23.4)
Outside Java Island	69 (27.8)
Type of Hospital	
Private clinic	59 (23.8)
Primary health care	39 (15.7)
Government hospital	76 (30.7)
Private hospital	74 (29.8)
Physicians	
General practitioner	208 (83.9)
Specialists	37 (14.9)
Dentist	3 (1.2)
mHealth Application used	
Alodokter	117 (47.2)
Halodoc	45 (18.2)
Docquity	45 (18.2)
D2D	41 (16.4)
mHealth application download	
<1 month ago	17 (6.9)
1-3 months ago	28 (11.3)
3-6 months ago	31 (12.5)
6-12 months ago	172 (69.4)
Average use mHealth application in the one week	134 (54.0)
0-1 time	76 (30.6)
2-3 times	18 (7.3)
4-5 times	20 (8.1)
>5 times	
Download CME	
Yes	154 (62.1)
No	94 (37.9)

Structural model testing

Table 2 shows the assessment of the 36 indicators associated with the twelve constructs, regarding the reflective measurement model that tested the construct reliability and validity, and discriminant validity.

Table 2. Convergent Reliability and Validity Statistics of the Sample.

Constructs	Items	Outer Loading	Cronbach Alpha	Composite Reliability	AVE
Colleague recommendation	COR1: My senior encourages me to use the application.	0.863	0.801	0.883	0.715
	COR2: My physician colleagues encourage me to use the application.	0.857			
	COR3: My workplace encourages me to use the application.	0.815			
Perceived eCME benefit	PEB1: Obtaining eCME through the application is useful.	0.960	0.966	0.978	0.936
	PEB2: Obtaining eCME is my main goal of using the application.	0.972			
	PEB3: Obtaining CME via online is useful.	0.970			
Job relevance	JER1: In my job, usage of the application is important.	0.901	0.877	0.924	0.803
	JER2: In my job, usage of the application is relevant.	0.917			
	JER3: In my job, usage of the discussion forum is useful.	0.869			
Networking quality	NEQ1: The application gives me access to a second opinion.	0.844	0.817	0.891	0.732
	NEQ2: The application facilitates communication with colleagues.	0.864			
	NEQ3: The application diminishes the feeling of isolation.	0.857			
Result demonstrability	RED1: I have no difficulty telling others about the results of using the application.	0.904	0.911	0.944	0.849
	RED2: I believe I could communicate to others the experiences of using the application.	0.938			
	RED3: The results of using the application are apparent to me.	0.922			
Application attractiveness	APA1: This application has an attractive screen background.	0.914	0.943	0.959	0.854
	APA2: This application has eye-catching images or title on homepage.	0.934			
	APA3: This application has an interesting multimedia content.	0.935			
Information quality	APA4: This application is fun to explore.	0.913	0.898	0.952	0.908
	INQ1: The application provides accurate information.	0.953			
	INQ2: The application provides up-to-date information.	0.952			
Information presentation	INP1: The structure of information presentation is clear.	0.972	0.944	0.973	0.947
	INP2: The structure of information presentation is logical.	0.974			
Knowledge confirmation	KOC1: I have learned new knowledge by using this application as I expected.	0.869	0.914	0.939	0.795
	KOC2: I have improved my skills by using this application as I expected.	0.883			
	KOC3: The application meets my needs.	0.902			
	KOC4: The application suits my needs.	0.911			
Perceived usefulness	PUS1: Using the application improves my performance in my job.	0.930	0.926	0.953	0.872
	PUS2: Using the application increases my productivity and enhances my effectiveness in my job.	0.923			
	PUS3: Using the application increases my effectivity in my job.	0.947			
Perceived ease of use	PEOU1: My interaction with the application clear.	0.880	0.884	0.927	0.810

	PEOU2: I find the application to be easy to use.	0.914			
	PEOU3: Learning to operate the application is easy for me.	0.905			
Intention to adopt	ITA1: I intend to use the application.	0.911	0.903	0.939	0.837
	ITA2: I expect to use the application in the future.	0.919			
	ITA3: I plan to use the application.	0.916			

All of the correlations between the indicators and the latent constructs are statistically significant ($p < .01$). All standardised outer loadings are greater than the threshold value (.70), indicating adequate indicator reliability. Cronbach's alpha and composite reliability values are above their threshold values ($>.70$), indicating that the model is statistically significant and that there is high evidence of internal consistency reliability. Each construct's average variance extracted (AVE) value was more than the threshold value ($>.5$), showing substantial convergent validity. These AVE values show that each construct accounts for more than half of the variation in their related indicators, indicating satisfactory convergent validity.

Table 3. Formative indicators' quality criteria.

Construct	Item	VIF	R ²	R ² adjusted	Q ²
Colleague recommendation	COR1	1.998	N/A	N/A	N/A
	COR2	1.774			
	COR3	1.565			
Perceived benefit	eCME PEB1	6.047	N/A	N/A	N/A
	PEB2	8.023			
	PEB3	7.737			
Job relevance	JER1	2.462	N/A	N/A	N/A
	JER2	2.753			
	JER3	2.161			
Networking quality	NEQ1	1.658	N/A	N/A	N/A
	NEQ2	1.984			
	NEQ3	1.883			
Result demonstrability	RED1	2.635	N/A	N/A	N/A
	RED2	3.893			
	RED3	3.312			
Application attractiveness	APA1	4.359	N/A	N/A	N/A
	APA2	4.814			
	APA3	4.388			
	APA4	3.407			
Information quality	INQ1	2.979	N/A	N/A	N/A
	INQ2	2.979			
Information presentation	INP1	4.982	N/A	N/A	N/A
	INP2	4.982			
Knowledge confirmation	KOC1	2.538	0.625	0.621	0.488
	KOC2	2.853			
	KOC3	3.422			
	KOC4	3.424			
Perceived usefulness	PUS1	3.422	0.622	0.611	0.529
	PUS2	3.385			

Perceived ease of use	PUS3	4.423			
	PEOU1	2.677	N/A	N/A	N/A
	PEOU2	3.123			
Intention to adopt	PEOU3	2.175			
	ITA1	2.828	0.548	0.546	0.452
	ITA2	3.104			
	ITA3	2.739			

Knowledge confirmation, perceived usefulness, and intention to adopt has a high degree of predictive relevance with Q^2 values of above 0.35 (0.448, 0.529, and 0.452 respectively) (Table 3). The heterotrait-monotrait ratio is evaluated to see the discriminant validity of each construct. The values are found to be lower than the predefined threshold (.85); hence, each construct is valid (Table 4).

Table 4. Discriminant validity coefficients.

	APA	COR	INP	INQ	ITA	JRE	KO C	NEQ	PEO U	PUS	PEB	RE D
APA												
COR	0.269											
INP	0.538	0.269										
INQ	0.646	0.209	0.672									
ITA	0.558	0.246	0.735	0.611								
JRE	0.520	0.445	0.600	0.483	0.694							
KOC	0.631	0.308	0.733	0.788	0.724	0.659						
NEQ	0.525	0.555	0.549	0.491	0.548	0.778	0.598					
PEO U	0.573	0.374	0.737	0.628	0.579	0.665	0.716	0.775				
PUS	0.546	0.339	0.800	0.591	0.807	0.747	0.700	0.574	0.713			
PEB	0.473	0.384	0.607	0.481	0.651	0.674	0.646	0.633	0.606	0.663		
RED	0.635	0.230	0.681	0.704	0.781	0.533	0.724	0.515	0.617	0.623	0.690	

When calculated based on the f^2 value, application attractiveness has a small effect while information presentation and information quality have a medium effect on knowledge confirmation. Job relevance, perceived eCME benefit, perceived ease of use, and knowledge confirmation has a small effect on perceived usefulness while the largest effect was observed from perceived usefulness to intention to adopt ($f^2 = 1.210$) (Table 5).

Table 5. Values of f^2 .

Path	f^2	Effect
Application attractiveness → knowledge confirmation	0.053	Small
Information presentation → knowledge confirmation	0.193	Medium
Information quality → knowledge confirmation	0.206	Medium
Job relevance → perceived usefulness	0.144	Small
Knowledge confirmation → perceived usefulness	0.027	Small
Perceived ease of use → perceived usefulness	0.098	Small
Perceived usefulness → intention to adopt	1.210	Large
Perceived eCME benefit → perceived usefulness	0.029	Small

Application attractiveness, information presentation, and information quality explain 62.5% of knowledge confirmation and together with job relevance, perceived eCME benefit, and result demonstrability; they explain 62.2% of perceived usefulness and perceived usefulness explains 54.8% of intention to adopt. Information quality had the strongest total effects on knowledge confirmation ($\beta = 0.389$, $p < 0.001$). Job relevance had the strongest total effects on perceived usefulness ($\beta = 0.353$, $p < 0.001$), followed by perceived ease of use ($\beta = 0.299$, $p < 0.001$) (Figure 2, Table 6). Networking quality was found to have negative effects on perceived usefulness, which was not the expected hypothesis, but was not statistically significant (Table 6).

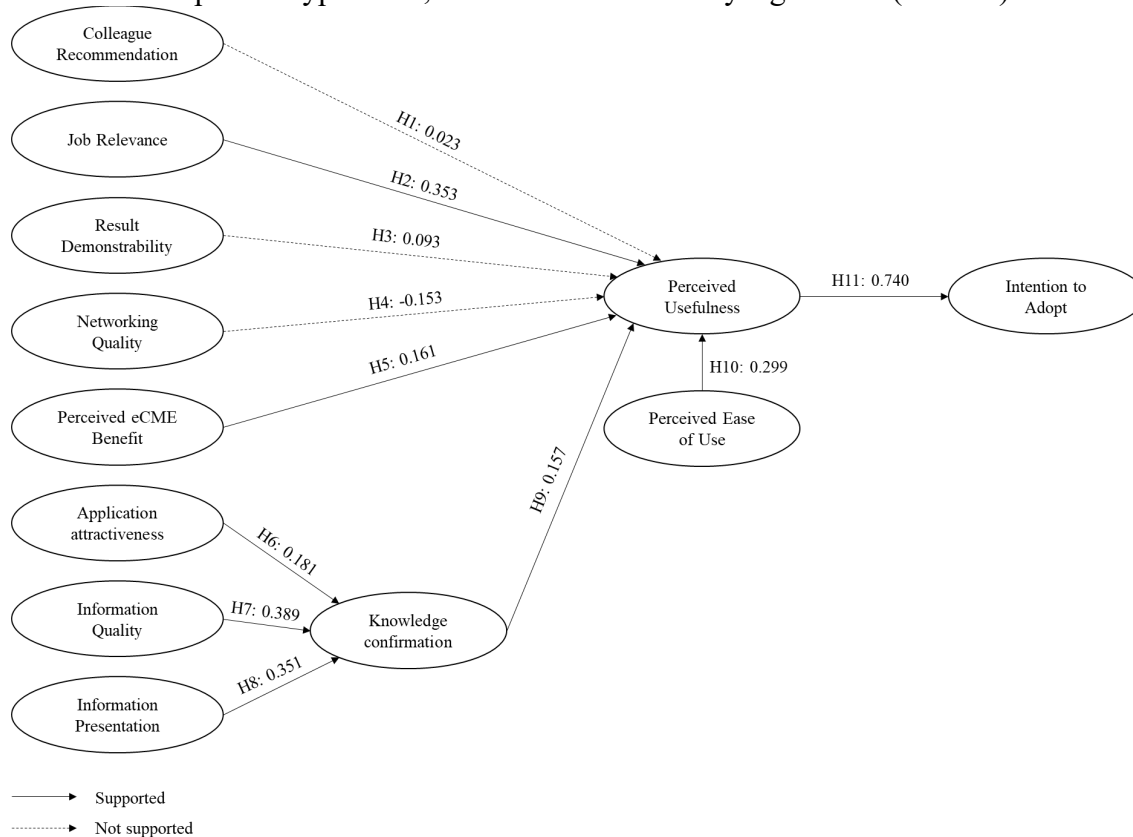


Figure 2. Structural model results.

Table 6. Hypotheses results.

Hypothesis	Path	Standardized Coefficient	t-statistics	p-value	Results
H1	Colleague recommendation → perceived usefulness	0.023	0.475	0.318	Not supported
H2	Job relevance → perceived usefulness	0.353	5.728	0.000	Supported
H3	Result demonstrability → perceived usefulness	0.093	1.590	0.056	Not supported
H4	Networking quality → perceived usefulness	-0.153	2.402	0.008	Not supported
H5	Perceived eCME benefit → perceived usefulness	0.161	2.284	0.011	Supported
H6	Application attractiveness → knowledge confirmation	0.181	3.049	0.001	Supported
H7	Information quality → knowledge confirmation	0.389	5.596	0.000	Supported
H8	Information presentation → knowledge confirmation	0.351	5.889	0.000	Supported
H9	Knowledge confirmation → perceived usefulness	0.157	2.400	0.008	Supported
H10	Perceived ease of use → perceived usefulness	0.299	4.428	0.000	Supported
H11	Perceived usefulness → intention to adopt	0.740	21.475	0.000	Supported

The structural model's total effects on a specific target construct were compared to its predecessors' average latent variable scores using importance-performance map analysis (IPMA) (Figure 3). The target for IPMA in this study was the intention to adopt and the most important construct is perceived usefulness with an importance score of 0.740 and a performance score of 69.840. Importance-performance map analysis was also done for the indicators (Figure 4). The most important indicator was PUS 1 (importance score of 0.274 with a performance score of 74.496), followed by PUS 3 (importance score of 0.263 with a performance score of 73.286). However, APA1 has the highest performance score out of all indicators with a score of 75.202.

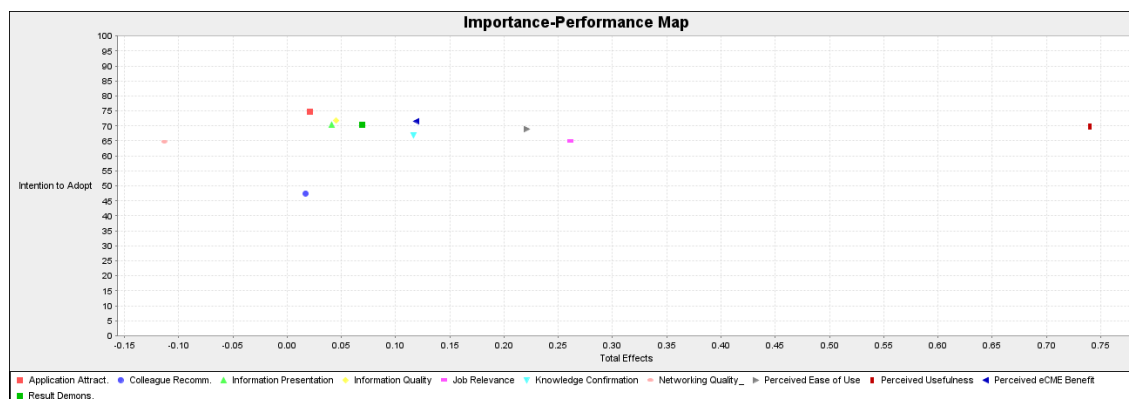


Figure 3. Importance-performance map (intention to adopt) for each construct.

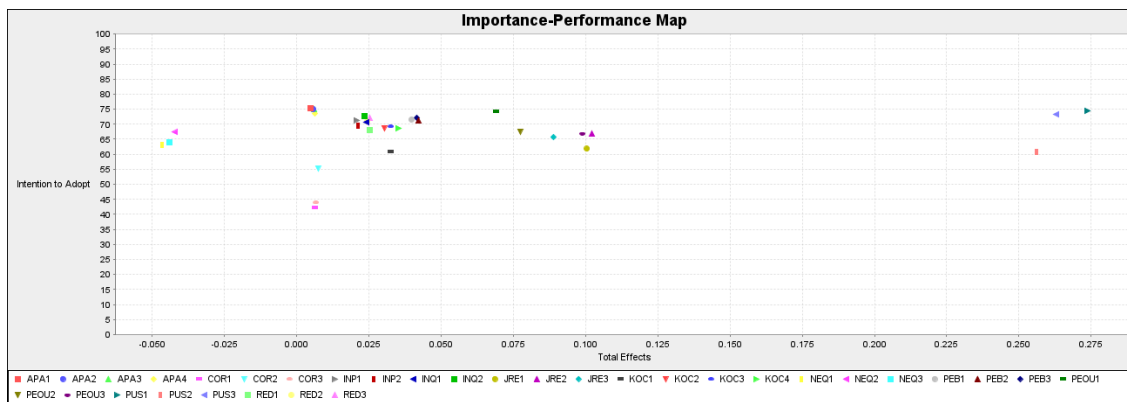


Figure 4. Importance-performance map (intention to adopt) for each construct.

Discussion

Principal Finding

Based on a different constructs in this research, colleague recommendation, perceived eCME benefit, job relevance, networking quality, result demonstrability, application attractiveness, information quality, information presentation, knowledge confirmation, perceived usefulness, perceived ease of use, intention to adopt, all the indicators have a Cronbach's Alpha of > 0.7 which means that all constructs are reliable as a source and can be used. Each of the constructs can be measured using different indicators and in this research, the outer loading is higher than 0.708 which means that all indicators that are used to measure that construct are reliable.

Theoretical Implications

The first hypothesis [H1] is not supported as colleague recommendations do not significantly affect the perceived usefulness. In other research that has been done by Gagnon MP et al, it can be said that the normative factor can become one of the factors that influence the usage of telemedicine (Gagnon et al., 2003). This result differs from what we found out in our research, the difference of the results can be traced towards the difference in the respondent characteristics in the two different scenarios between, Gagnon's and ours. Gagnon's respondent average age is 43 years old compared to our respondents which belong in the 21-30 years age group. This age difference between the two similar research can substantially create a difference due to the fact that different age groups respond and perceive technology differently especially towards telemedicine. The younger respondents have higher information and knowledge regarding telemedicine as a whole compared to the older age groups used in Gagnon's. The younger age group is also able to use technologies better most of the time than the older group. On daily basis, the younger group also uses technology as a part of their lives which influences how they think, act, as well as absorbs any information towards the current trend and technology. Younger age groups tend to have a better understanding towards the technology, resulting in a higher tendency to use applications rather than the older age groups (Lee & Maher, 2021).

The second hypothesis [H2] is the third-best hypothesis as job relevance positively affects perceived usefulness with 0.353 as their standardized coefficient value. This statement has been provided by a previous study, in which they proved that a person that uses telemedicine due to the fact that telemedicine helps them with their work in their field (Shiferaw et al., 2021).

The third [H3] hypothesis is not supported due to the fact that in this era, the usage of electronic devices and applications are more easily learned, understood, and mastered to some extent. Even applications help new users to learn about their apps, by having tutorials to use their apps so the

user can have a smooth and enjoyable experience while using their apps. This is why most people won't need any help from others when using a new application (Hashim, 2018).

Networking quality is not supported as perceived usefulness [H4] because the majority of the respondent didn't use the application to talk and communicate with other physicians, they mostly used it to learn more knowledge by accessing journals or watching a webinar. This can be seen from the f^2 where networking quality has a lower correlation. Compared to knowledge confirmation and perceived eCME benefits.

Statistically, the fifth hypothesis are supported, the perceived eCME has a positive impact towards the perceived usefulness [H5]. People used Telemedicine to received one of its biggest advantages, that is to receive eCME where people won't have to physically attend to a location that requires another extra accommodation (either in the form of sleeping accommodation or transportation fees) and are still able to enroll. In a webinar. In a previous peer-reviewed journal by Wang F, she explained that increases in provisions of online CME lectures are associated with health improvements (Wang, 2016). However, there is a level of optimum where the plateau has been reached where greater provisions of online CME lectures won't give out any benefits and instead will decrease the population health. In conclusion, health attainment could be partially viewed as a way to determine the success of eCME that can be provided properly. This study has evaluated the population's health outcomes and can be used to respond towards the inadequate provisions of online CME lectures via telemedicine. This proves what we are researching where the perceived eCME benefits will positively impact the perceived usefulness, but we have to remember that it will only go up to a certain degree until it reacts negatively towards the main objectives.

In this research, application attractiveness and information presentation have an effect in regards towards knowledge confirmation [H6] [H8]. In the past peer-reviewed paper that is written by Blagoyeshchenskava, Ilina, & Zemtsov (2020), they stated that how we wrapped and introduce an application or other method of introduction towards telemedicine requires unique and distinct characteristics that can create a sense of appeal towards the users that can affect how they thought about the usage of telemedicine where we have to create a pleasant experience while they use the applications on the daily basis.

Information quality is supported by knowledge confirmation [H7] due to the fact that new incoming knowledge can be perceived and received properly when the new information has a good level of quality that can be easily understood where it will help the process for the person to receive better knowledge as a whole. Without good quality information, no knowledge can be understood and used properly.

Knowledge confirmation supported the perceived usefulness as we predicted in the ninth Hypothesis. mHealth, physician practical works, the general public health are supported by using applications in smartphones, tablets, computers, and any other different smart devices that are available currently. In this research, we can see mHealth is focused as a media to educate as well as to provide additional care while using the internet where the individuals do not have to be physically face to face (Waller & Stotler, 2018). Due to the fact that the usage of mHealth focuses as a way to teach and share experience towards another practical practitioner, the usage of the mHealth heavily affecting the perceived usefulness of this or other telemedicine applications that existed.

Perceived ease of use supported the perceived usefulness [H10]. According to the previous study by An et al, the theory of reasoned action, where people's belief such as perceived usefulness and perceived ease of use shapes the attitudes of the people, influences their individual behaviors (An et al., 2021). Many studies have demonstrated that when people perceive technology as useful,

the likelihood of accepting the technology will increase. Evidence also shows that when a technology is easy to use, the attitude towards it became positive. In this case, we anticipated that the perceived usefulness and the perceived ease of use of telehealth would improve the people's mind and attitude towards it, and the more positive the way of the general public in regards of the application, the better it would be on how the system will change and new improved technologies will rise to increase better telemedicine care that can be provided to the en mass.

The perceived usefulness of telemedicine has a high impact regarding the intentions to adopt telemedicine [H11]. From the samples, we can see that the standardized coefficient is 0.740 which means both constructs affect and support each other positively. Kamal et al. (2018) found out that perceived usefulness is one of the constructs that influences practitioners and physicians to use telemedicine. This is one of the reasons why every people used telemedicine, the fact that telemedicine has something to offer to the people that use the new tech. Most of the time, when physicians don't use telemedicine, they don't use any method or any media to help them whatsoever in which they don't follow with the development of new technologies that possibly could increase their knowledge and creates a better opportunity for them in future.

As much as we've learned about the positive benefits of telemedicine that can contribute towards the future of long-distance medical care and learning, we also have to understand that there are always some negative impacts to keep in mind regarding the technology. Concerns regarding the credibility of the applications of telemedicine, where the developer behind has a good intention to actually create a useful telemedicine app or will it be a way to scam people from their hard-earned money by providing to almost nothing while the potential users and customers already paid for the app. Another example is the security of the application, as we all know, the world is currently developing through technology rapidly, but there's always a security risk that might appear out of thin air (Shachar, Engel, & Elwyn, 2020). Security breaches especially in applications that will handle thousands of private information might be used maliciously where the impact can be devastating. This can cause a great issue especially identity theft when the impact could ruin a person's life forever. We have to weigh the risk and understand what is the best options regarding telemedicine in the future, both as users or as developers due to the fact that technology can shape the future of medicine.

Limitations

There are several limitations from our study. First of all, due to the pandemic, we used Google Forms to collect the data; therefore, if there is an answer that we need to clarify, we could not do it directly to the respondents, resulting in missing answers from the responses. Secondly, many of our respondents were in the younger age group that might be more proficient in using technology such as mobile applications and filling out online forms; hence, our results might lack of opinions from older generations of physicians. This also explains how our responses came from mostly general practitioners rather than specialists. Our proposed model is able to explain the 62.2% of the variance of perceived usefulness while perceived usefulness explains 54.8% of intention to adopt. Therefore, further study needs to be done to explore certain elements that may be unnoticed in this study.

Conclusion

Just like in human beings, the first impressions matter, these impressions can be applied to the newly developing technology of telemedicine where the general public first impressions will determine the future of how the people will think about the technology and how it will develop and. Shape the future of medicine that might create a breakthrough that might solve problems such

as availability of the en masse where they might not be able to receive proper care due to the lack of on-site professionals or even increase the efficiency of smaller, less urgent cases where it will take of a lot of loads from a general practitioner and other healthcare professionals where their attention may be required elsewhere to attend to more dangerous and imminent healthcare problems. We also have to understand that the younger generation might use this new technology of telemedicine better and more frequent than the older generation due to the fact that the younger generation mingles with technology from such an early age, compared to those that rarely use any technologies in their lifetime granted some people will follow the others niche disregarding the age groups completely due to the unique nature of human being. And back to the applications itself, no matter how well other people recommend or how good the developer of the application demonstrated the usage of the application, none will beat the common mind of the people where they will believe the products (in this case, the mHealth applications) after they started using it on their own, nothing will beat the personal experience that will create positive feedback that will become a result of revisiting the mHealth application once they require the need to do it again in the future.

REFERENCES

- ACCME. ACCME Data Report Rising to the Challenge in Accredited Continuing Education – 2020 [Internet]. Accreditation Council for Continuing Medical Education. 2020. Available from: https://www.accme.org/sites/default/files/2021-06/902_20210615_2020_Data_Report.pdf
- Alas, R., Übius, U., Lorents, P., & Matsak, E. (2017). Corporate Social Responsibility In European And Asian Countries. *Jurnal Manajemen Bisnis Dan Inovasi (JMBI) UNSRAT Vol. 4 No. 1*
- ALOMEDIKA. ALOMEDIKA Khusus Untuk Dokter [Internet]. ALOMEDIKA. 2021. Available from: alomedika.com
- An MH, You SC, Park RW, Lee S. Using an Extended Technology Acceptance Model to Understand the Factors Influencing Telehealth Utilization After Flattening the COVID-19 Curve in South Korea: Cross-sectional Survey Study. *JMIR Med informatics* [Internet]. 2021 Jan 8;9(1):e25435–e25435. Available from: <https://pubmed.ncbi.nlm.nih.gov/33395397>
- Anderson EW, Sullivan MW. The Antecedents and Consequences of Customer Satisfaction for Firms. *Mark Sci* [Internet]. 1993 Sep 30;12(2):125–43. Available from: <http://www.jstor.org/stable/184036>
- Arizton Advisory & Intelligence. Continuing Medical Education Market Size to Reach Revenues of USD 11.57 Billion by 2026 [Internet]. Arizton. 2021. Available from: <https://www.prnewswire.com/news-releases/continuing-medical-education-market-size-to-reach-revenues-of-usd-11-57-billion-by-2026--arizton-301303897.html>

- Bangdiwala SI, Fonn S, Okoye O, Tollman S. Workforce Resources for Health in Developing Countries. *Public Health Rev* [Internet]. 2010;32(1):296–318. Available from: <https://doi.org/10.1007/BF03391604>
- Bhattacharjee A. Understanding Information Systems Continuance: An Expectation-Confirmation Model. *MIS Q* [Internet]. 2001 Sep 30;25(3):351–70. Available from: <http://www.jstor.org/stable/3250921>
- Blagoveshchenskaya O, Ilina T, Zemtsov A. Methodological Approaches to Assessing the Investment Attractiveness of Telemedicine. *SHS Web Conf* [Internet]. 2020;80. Available from: <https://doi.org/10.1051/shsconf/20208001005>
- Cervero RM, Gaines JK. The Impact of CME on Physician Performance and Patient Health Outcomes: An Updated Synthesis of Systematic Reviews. *J Contin Educ Health Prof* [Internet]. 2015;35(2). Available from: https://journals.lww.com/jcehp/Fulltext/2015/35020/The_Impact_of_CME_on_Physician_Performance_and.8.aspx
- Dabholkar PA, Shepherd CD, Thorpe DI. A comprehensive framework for service quality: an investigation of critical conceptual and measurement issues through a longitudinal study. *J Retail* [Internet]. 2000;76(2):139–73. Available from: <https://www.sciencedirect.com/science/article/pii/S0022435900000294>
- Damaske J, Walsh W, McKay J. CME in the Time of COVID-19: Educating Healthcare Professionals at the Point-of-care and Improving Performance Outcomes. *J Eur C* [Internet]. 2020 Oct 16;9(1):1832798. Available from: <https://pubmed.ncbi.nlm.nih.gov/33224626>
- Davis D. Does CME Work? An Analysis of the Effect of Educational Activities on Physician Performance or Health Care Outcomes. *Int J Psychiatry Med* [Internet]. 1998 Mar 1;28(1):21–39. Available from: <https://doi.org/10.2190/UA3R-JX9W-MHR5-RC81>
- Davis DA, Thomson MA, Oxman AD, Haynes RB. Evidence for the Effectiveness of CME: A Review of 50 Randomized Controlled Trials. *JAMA* [Internet]. 1992 Sep 2;268(9):1111–7. Available from: <https://doi.org/10.1001/jama.1992.03490090053014>
- Davis FD. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Q* [Internet]. 1989 Sep 30;13(3):319–40. Available from: <http://www.jstor.org/stable/249008>
- Deloitte Indonesia. 21st Century Health Care Challenges: A Connected Health Approach. Deloitte Konsultan Indonesia. 2019. p. 1–114.
- Djalante R, Lassa J, Setiamarga D, Sudjatma A, Indrawan M, Haryanto B, Mahfud C, Sinapoy MS, Djalante S, Rafliana I, Gunawan LA, Surtiari GAK, Warsilah H. Review and analysis of current responses to COVID-19 in Indonesia: Period of January to March 2020. *Prog*

- Disaster Sci [Internet]. 2020;6:100091. Available from: <https://www.sciencedirect.com/science/article/pii/S2590061720300284>
- Fishbein M, Ajzen I. *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading: Addison-Wesley; 1975. 302 p.
- Gagnon MP, Duplantie J, Fortin JP, Landry R. Implementing telehealth to support medical practice in rural/remote regions: What are the conditions for success? *Implement Sci*. 2006;1(1).
- Gagnon M-P, Godin G, Gagné C, Fortin J-P, Lamothe L, Reinharz D, Cloutier A. An adaptation of the theory of interpersonal behaviour to the study of telemedicine adoption by physicians. *Int J Med Inform [Internet]*. 2003;71(2):103–15. Available from: <https://www.sciencedirect.com/science/article/pii/S1386505603000947>
- Gravas S, Ahmad M, Hernández-Porras A, Furriel F, Alvarez-Maestro M, Kumar A, Lee K-S, Azodoh E, Mburugu P, Sanchez-Salas R, Bolton D, Gomez R, Klotz L, Kulkarni S, Tanguay S, Elliott S, de la Rosette J, Directors O of E and SIUB of. Impact of COVID-19 on medical education: introducing homo digitalis. *World J Urol [Internet]*. 2020/08/29. 2021 Jun;39(6):1997–2003. Available from: <https://pubmed.ncbi.nlm.nih.gov/32860535>
- Hadadgar A, Changiz T, Dehghani Z, Backheden M, Mirshahzadeh N, Zary N, Masiello I. A Theory-Based Study of Factors Explaining General Practitioners' Intention to Use and Participation in. *J Contin Educ Health Prof*. 2016;36(4):290–4.
- Hashim H. Application of Technology in the Digital Era Education. *Int J Res Couns Educ*. 2018;2(1):1–5.
- Haug N, Geyrhofer L, Londei A, Dervic E, Desvars-Larrive A, Loreto V, Pinior B, Thurner S, Klimek P. Ranking the effectiveness of worldwide COVID-19 government interventions. *Nat Hum Behav [Internet]*. 2020;4(12):1303–12. Available from: <https://doi.org/10.1038/s41562-020-01009-0>
- Honda A, Krucien N, Ryan M, Diouf ISN, Salla M, Nagai M, Fujita N. For more than money: willingness of health professionals to stay in remote Senegal. *Hum Resour Health [Internet]*. 2019 Apr 25;17(1):28. Available from: <https://pubmed.ncbi.nlm.nih.gov/31023372>
- Hugenholtz NIR, de Croon EM, Smits PB, van Dijk FJH, Nieuwenhuijsen K. Effectiveness of e-learning in continuing medical education for occupational physicians. *Occup Med (Lond) [Internet]*. 2008/05/20. 2008 Aug;58(5):370–2. Available from: <https://pubmed.ncbi.nlm.nih.gov/18495676>
- Ismail II, Abdelkarim A, Al-Hashel JY. Physicians' attitude towards webinars and online education amid COVID-19 pandemic: When less is more. *PLoS One [Internet]*. 2021 Apr 16;16(4):e0250241. Available from: <https://doi.org/10.1371/journal.pone.0250241>
- Jones CL, Jensen JD, Scherr CL, Brown NR, Christy K, Weaver J. The Health Belief Model as an explanatory framework in communication research: exploring parallel, serial, and

- moderated mediation. *Health Commun* [Internet]. 2014/07/10. 2015;30(6):566–76. Available from: <https://pubmed.ncbi.nlm.nih.gov/25010519>
- Jumreornvong O, Yang E, Race J, Appel J. Telemedicine and Medical Education in the Age of COVID-19. *Acad Med*. 2020;95(12):1838–43.
- Karamoy, H., & Tulung, J. E. (2020). The Effect of Banking Risk on Indonesian Regional Development Bank. *Banks and Bank Systems*, 15(2), 130-137
- Karamoy, H., & Tulung, J. E. (2020). The Effect of Financial Performance and Corporate Governance To Stock Price In Non-Bank Financial Industry. *Corporate Ownership & Control*, 17(2), 97-103.
- Kamal SA, Hussain S, Shafiq M, Jahanzaib M. Investigating the Adoption of Telemedicine Services : An Empirical Study of Factors Influencing Physicians ' Perspective in Pakistan. *Nucl*. 2018;3(3):153–63.
- Koo C, Wati Y, Park K, Lim MK. Website Quality , Expectation , Confirmation , and End User Satisfaction : The Knowledge-Intensive Website of the Korean National Cancer Information Center. *J Med Internet Res*. 2011;13(4):1–14.
- Lee L, Maher M Lou. Factors Affecting the Initial Engagement of Older Adults in the Use of Interactive Technology. *Int J Environ Res Public Health* [Internet]. 2021 Mar 11;18(6):2847. Available from: <https://pubmed.ncbi.nlm.nih.gov/33799568>
- Madede T, Sidat M, McAuliffe E, Patricio SR, Uduma O, Galligan M, Bradley S, Cambe I. The impact of a supportive supervision intervention on health workers in Niassa, Mozambique: a cluster-controlled trial. *Hum Resour Health* [Internet]. 2017 Sep 2;15(1):58. Available from: <https://pubmed.ncbi.nlm.nih.gov/28865466>
- Narayan KMV, Curran JW, Foege WH. The COVID-19 Pandemic as an Opportunity to Ensure a More Successful Future for Science and Public Health. *JAMA* [Internet]. 2021 Feb 9;325(6):525. Available from: <https://jamanetwork.com/journals/jama/fullarticle/2776207>
- Nylenna M, Aasland OG. Doctors' learning habits: CME activities among Norwegian physicians over the last decade. *BMC Med Educ* [Internet]. 2007;7(1):10. Available from: <https://doi.org/10.1186/1472-6920-7-10>
- Octavius GS, Antonio F. Antecedents of Intention to Adopt Mobile Health (mHealth) Application and Its Impact on Intention to Recommend: An Evidence from Indonesian Customers. Colloc J, editor. *Int J Telemed Appl* [Internet]. 2021;2021:6698627. Available from: <https://doi.org/10.1155/2021/6698627>
- Oliver RL. A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *J Mark Res* [Internet]. 1980 Nov 1;17(4):460–9. Available from: <https://doi.org/10.1177/002224378001700405>

- Oliver RL. Cognitive, Affective, and Attribute Bases of the Satisfaction Response. *J Consum Res* [Internet]. 1993 Dec 1;20(3):418–30. Available from: <https://doi.org/10.1086/209358>
- Patterson PG, Johnson LW, Spreng RA. Modeling the determinants of customer satisfaction for business-to-business professional services. *J Acad Mark Sci* [Internet]. 1997;25(1):4. Available from: <https://doi.org/10.1007/BF02894505>
- Shachar C, Engel J, Elwyn G. Implications for Telehealth in a Postpandemic Future: Regulatory and Privacy Issues. *J Am Med Assoc*. 2020;323(23):2375–6.
- Shiferaw KB, Mengiste SA, Gullslett MK, Zeleke AA, Tilahun B, Tebeje T, Wondimu R, Desalegn S, Mehari EA. Healthcare providers' acceptance of telemedicine and preference of modalities during COVID-19 pandemics in a low-resource setting: An extended UTAUT model. *PLoS One* [Internet]. 2021 Apr 22;16(4):e0250220. Available from: <https://doi.org/10.1371/journal.pone.0250220>
- Taherdoost H. ScienceDirect ScienceDirect A review of technology acceptance and adoption models and theories A review of technology acceptance and adoption models Costing models for capacity optimization Trade-off between used capacity operational efficiency. *Procedia Manuf* [Internet]. 2018;22:960–7. Available from: <https://doi.org/10.1016/j.promfg.2018.03.137>
- Thi Nguyen VA, Könings KD, Scherpbier AJJA, van Merriënboer JJG. Attracting and retaining physicians in less attractive specialties: the role of continuing medical education. *Hum Resour Health* [Internet]. 2021 May 19;19(1):69. Available from: <https://pubmed.ncbi.nlm.nih.gov/34011364>
- Tingchi Liu M, Brock JL, Cheng Shi G, Chu R, Tseng T. Perceived benefits, perceived risk, and trust. Melewar TC, Alwi S, editors. *Asia Pacific J Mark Logist* [Internet]. 2013 Jan 1;25(2):225–48. Available from: <https://doi.org/10.1108/13555851311314031>
- Tse DK, Wilton PC. Models of Consumer Satisfaction Formation: An Extension. *J Mark Res* [Internet]. 1988 Sep 30;25(2):204–12. Available from: <http://www.jstor.org/stable/3172652>
- Venkatesh V, Davis FD. A Model of the Antecedents of Perceived Ease of Use: Development and Test. *Decis Sci* [Internet]. 1996 Sep;27(3):451–81. Available from: <https://onlinelibrary.wiley.com/doi/10.1111/j.1540-5915.1996.tb00860.x>
- Venkatesh V, Morris MG, Davis GB, Davis FD. User Acceptance of Information Technology: Toward a Unified View. *MIS Q* [Internet]. 2003 Sep 30;27(3):425–78. Available from: <http://www.jstor.org/stable/30036540>
- Venkatesh; Viaswanath, Davis; Fred D. A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Manage Sci* [Internet]. 2000;46(2):186–204. Available from: <https://www.jstor.org/stable/pdf/2634758.pdf>

- Waller M, Stotler C. Telemedicine: a Primer. *Curr Allergy Asthma Rep* [Internet]. 2018;18(10):54. Available from: <https://doi.org/10.1007/s11882-018-0808-4>
- Wang F. Continuing Medical Education via Telemedicine and Sustainable Improvements to Health. *Int J Telemed Appl*. 2016;2016.