



Behavioral Technology Acceptance Model In Health Care Industry: Systematic Literature Review

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Abstract

Identify the problems of several Research Gaps, namely the lack of breadth and depth in the Technology Acceptance Model (TAM) variables with other variables that will be tested, as well as potential variables that contribute to improvements to the proposed model. This research is a systematic literature review that discusses descriptively the components of the Technology Acceptance model in health services and creates a conceptual framework in health services. Articles were taken from three databases, namely EBSCOhost, Proquest, Emerald with exclusion criteria, namely academic journals and article formats in English. Based on full text screening, 255 articles were obtained with the criteria research focus, unit of analysis, data collection unit, context, digital-based health services. After reviewing 52 articles based on complete content, systematic literature reviews and digital-based health services, the journals synthesized were 15 journals based on technology acceptance in the digital health services industry. The impressive conclusion of the research results is the relationship between external variables such as practical experience and skills on the use of health technology which is influenced by beliefs and culture among users of digital-based health services.

Keywords: Conceptual Acceptance Frameworks, In health Care Industry, Systematic Literature Review, Technology Acceptance Model.

Model Perilaku Penerimaan Teknologi Pada Industri Pelayanan Kesehatan: Tinjauan Literatur Sistematis

Abstrak

Identifikasi permasalahan dari beberapa Research Gap yaitu belum adanya keluasan dan kedalaman pada variable Technology Acceptance Model (TAM) dengan variabel lain yang akan diuji, serta potensi variable yang memberikan kontribusi penyempurnaan terhadap model yang diajukan. Penelitian ini merupakan tinjauan literatur sistematis yang membahas secara deskriptif tentang komponen model Penerimaan Teknologi dalam pelayanan kesehatan dan membuat kerangka konseptual dalam pelayanan kesehatan. Artikel diambil dari tiga database yaitu EBSCOhost, Proquest, Emerald dengan batasan kriteria eksklusi yaitu jurnal akademik dan format artikel dalam bahasa Inggris. Berdasarkan penyaringan teks lengkap diperoleh 255 artikel dengan kriteria Fokus penelitian, unit analisis, unit pengumpulan data, konteks, layanan kesehatan berbasis digital. Setelah mereview 52 artikel berdasarkan konten lengkap, tinjauan literatur sistematis dan layanan kesehatan berbasis digital, jurnal yang disintesis adalah 15 jurnal berbasis penerimaan teknologi pada industri layanan Kesehatan digital. Kesimpulan hasil penelitian yang mengesankan adalah hubungan antara variabel eksternal seperti pengalaman praktis dan keterampilan terhadap penggunaan teknologi kesehatan yang dipengaruhi oleh kepercayaan dan budaya pada pengguna layanan kesehatan berbasis digital.

Kata Kunci: Kerangka Penerimaan Konseptual, Industri Pelayanan Kesehatan, Tinjauan Literatur Sistematis, Model Penerimaan Teknologi.

1. Introduction

TAM has come a long way. There are still many interesting directions for making future discoveries. The reason for taking the TAM variable in health care is because telemedicine applications from 1999-2017 in the Information and Communication Technology (ICT) application area use TAM, implying acceptance of technology is a major challenge in utilizing ICT to develop health services¹. The technology acceptance model (TAM), introduced in 1986, continues to be the most widely applied theoretical model in the field of information systems, several previous efforts have tested its achievements and have limitations such as the lack of breadth and depth in the TAM variable with other variables that will be tested, as well as potential variables that can improve the predictive performance of TAM. Increasing user interest in health information technology (IT) has increased the importance of theories that predict and explain the acceptance and use of digital health services². Researchers identified problems from several Research Gaps that were found, namely the lack of breadth and depth in the Technology Acceptance Model (TAM) variables with other variables to be tested, as well as potential variables that could improve the predictive performance of TAM and contribute to improvements to the proposed model³. Therefore, based on this the authors get two research questions, namely:

1. RQ1 : What are the components of Technology Acceptance model in health care industry? (Descriptive)

2. RQ2 : How are other conceptual acceptance frameworks available in health care industry? (Implementation). The aim of this research is a systematic literature review that discusses descriptively about the components of Technology Acceptance model in health care industry and makes a conceptual framework in the health care industry.

2. Method

2.1. Search Strategy

From the three selected databases, namely EBSCOhost, Proquest, Emerald, the

search strings (construct, keywords, codes, search strings) were obtained as follows: Components Factors, elements, parts. "Components" OR "Factors" OR "elements" OR "parts". "Components" OR "Factors" OR "elements" OR "parts" AND Technology Acceptance Model Technology Acceptance Model "Technology Acceptance Model". "Technology Acceptance Model" AND Conceptual Theoretical, "conceptual" OR Theoretical, "conceptual" OR Theoretical" AND Acceptance Recognition, Approval, Agreement. "Acceptance" OR Recognition" OR "Approval" OR "Agreement" "Acceptance" OR Recognition" OR "Approval" OR "Agreement" AND Frameworks Contexts, bases. "Frameworks" OR Contexts" OR "bases". "frameworks" OR Contexts" OR "bases" AND Health care Industry Health Care Industry "Health Care Industry". "Health Care Industry".

2.2. Inclusion and Exclusion Criteria

Articles are taken from three databases, namely EBSCOhost, Proquest, Emerald with search limitations, namely academic journals, article format and in English. 3,800 articles were obtained and duplicates were removed. From 3,800 articles, 750 articles were obtained which will be screened with the appropriate title and abstract criteria. Based on full text screening, 255 articles were obtained with the criteria research focus, unit of analysis, data collection unit, context, digital-based health services. After 255 articles were filtered according to the inclusion criteria, 52 final papers were obtained which would be reviewed with details from the Emerald database, 52 final papers were obtained which will be reviewed with details from the Emerald database obtained 6 articles, Proquest 18 articles, EBSCOhost 28 articles for a total of 52 articles. The article screening process is detailed in Figure 1.

3. Results

Full text articles assessed for eligibility (n=52) with details from Emerald 6 articles, Proquest 18 articles, EBSCOhost 28 articles.

After reviewing 52 articles based on complete content, systematic literature reviews and digital-based health services, the journals synthesized were 152 journals based on technology acceptance in the digital health services industry. To answer RQ 1 and RQ 2, a systematic characteristic table of literature review was made as in table 1.

Based on table 1, we can answer research question (RQ) 1 and research question (RQ) 2, is a dimension of TAM in the healthcare industry which consist of the relationships among patients, caregivers and health-care providers are framed in the cyber-physical domain, with major implications on the design and delivery of health services, Crowdsourcing, Distributed Intelligence, Participatory Science, Extreme citizen Science, The acceptability, adherence, and usability of the connected health technologies, Thoughts, Emotion, Behavior, physiological response, user-rated quality of the stand-alone mobile mindfulness app and use of the app, leading to greater self-confidence, better cooperation, and practical experience and skills, self management, trust, culture, Psychological Intervention and gamification. Answering research question (RQ) 2 we can look at the technology acceptance model in health care are perceived usefulness, perceived ease of use, e-health safety, e-trust and e-health belief. Technology Acceptance model in the health care industry is the relationship between external variables such as practical experience and skills on the usability of health technology²).

4. Discussion

Based on the research objective, namely to determine the components or dimensions of the TAM variable in digital health services, the results obtained by the TAM dimensions consist of perceived usefulness, perceived ease of use, e-health safety, e-trust and e-health belief. The increase in the use of TAM appears to be justified by the many associations defined by TAM that apply in the health care industry setting. Perhaps the most impressive is that the relationship between external variables such as practical experience and skills on the usability of the connected health technologies which is influenced by trust and culture that results in the use of health applications in digital media. Therefore, to better explain the research question (RQ 2), the author tries to create a technology acceptance model in the health care industry at figure 3.

4.1. Limitations

This systematic literature review has several limitations which are mostly related to the lack of research available for analysis such as the different cultures of each country which impact the behavioral model of technology acceptance. The healthcare industry is a highly developed industry in recent times. The components of TAM contained in the 152 syntheses of review articles are very varied and only implied, so the author must be able to provide an opinion that is in accordance with the external variables of the research object which are still generally described in this systematic review literature.

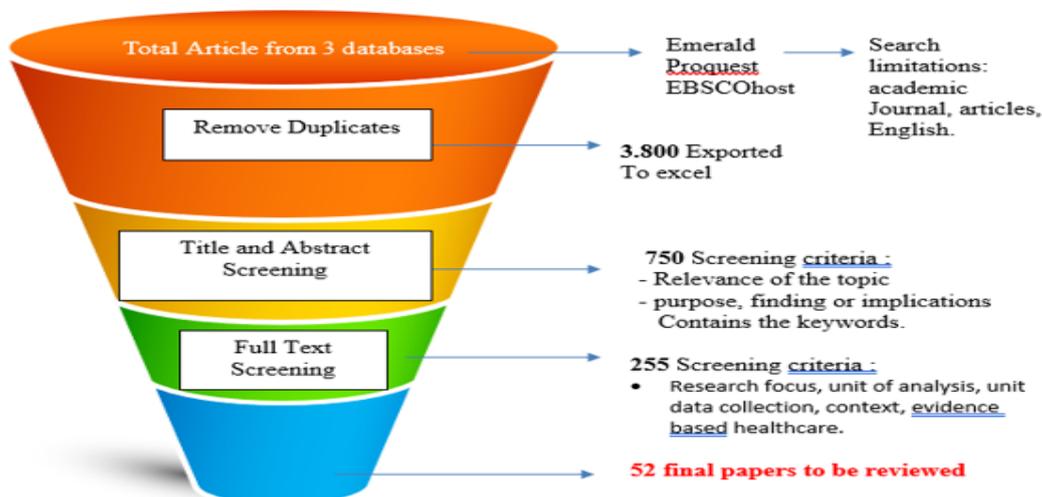


Figure 1. SLR Funnel

Table 1. Characteristics of Systematic Literature Review

No	Journal/Title	Research Objective	Result	Components Of TAM In healthcare Industry
1	Emerald / Addressing health literacy in the digital domain: insights from a literature review ⁴	The digitalization of healthcare reframes health literacy in a cyber-physical environment.	This article is about digital health literacy and investigates the role of healthcare organizations in delivering healthcare in a digital health literacy environment	The transition to digital health has enormous implications for the delivery of health services ⁵ . This requires that healthcare users and providers develop tailored skills and competencies to navigate digital healthcare system and to overcome unprecedented barriers to achieving goals and appropriate access to treatment ⁶ .
2	Emerald / Open innovation approach participate in producing scientific knowledge: user examination in the healthcare eco-system ⁷ .	This article applies the phenomenon of citizen science – namely the involvement of ordinary people in research aimed at advancing scientific knowledge in the health sector.	Science enables the development of a dynamic healthcare ecosystem from data collectors to data analysts. In addition, it gathers active user involvement in co-creation of value.	a.Crowdsourcing b.Distributed Intelligence. c.Participatory Science. d.Extreme citizen Science.
3	JMIR MENTAL HEALTH / eHealth Interventions for Treatment and Prevention of Depression, Anxiety, and Insomnia During Pregnancy: Systematic Review and Meta-analysis ⁸	The objective of this systematic review and meta-analysis is to determine the effectiveness of eHealth interventions in preventing and treating depression, anxiety, and insomnia during pregnancy. Secondary aims are to identify demographic and intervention moderators of effectiveness.	The results showed that during pregnancy, eHealth interventions showed small effect sizes in preventing and treating symptoms anxiety and depression and a moderate effect size for treating insomnia symptoms. Except for the type of intervention for depressive symptom outcomes, where mindfulness interventions outperformed other types of interventions.	a. Anxiety b. Depression c. Insomnia Several studies included both depression and anxiety symptoms as outcomes (7/17, 41%). The results indicated that during pregnancy.
4	International Journal of Environmental Research and Public Health (MDPI) / Does Connected Health Technology Improve Health - Related Outcomes in Rural Cardiac Populations? Systematic Review Narrative Synthesis ⁹	This systematic review aims to understand the types and impacts of home-based health technology, used by individuals living in rural areas with Cardiovascular Disease (CVD). Inclusion criteria are included technology implemented in participants' homes and can take the form of mHealth (smart devices, fitness trackers or app) or telehealth interventions.	Based on Existing findings show that there is great potential for implementing connected health technology, but this is due to the low potential for implementing connected health technology number of studies that meet the inclusion criteria, further research is needed in rural areas those living with cardiovascular disease.	The acceptability, adherence, and usability of the connected health technologies.

5	<p>BMJ Open / Living with Insomnia’: an mHealth intervention for individuals with insomnia in China: a study protocol of a randomised controlled trial¹⁰</p>	<p>The method and analysis of this research is a randomized controlled trial. Two hundred and fifty Participants will be allocated randomly and evenly either the MLWI or CBT-I group. Intervention will occur involves 12 sessions over a 6 week course, with 2, 30 minute sessions per week.</p>	<p>The primary outcomes were sleep quality, insomnia symptom severity and sleep activity, according to the Pittsburgh Sleep Quality Index, Insomnia Severity Index and Mi Smart Band sleep tracker, respectively. Secondary outcomes were perceived stress, anxiety, depression and concern. Outcomes will be evaluated at baseline, end of the intervention period and at 3-month follow-up.</p>	<p>a. Thoughts b. Emotion c. Behaviour d. physiological response.</p>
6	<p>BMJ Open / Teleophthalmology-enabled and artificial intelligence-ready referral pathway for community optometry referrals of retinal disease (HERMES): a Cluster Randomised Superiority Trial with a linked Diagnostic Accuracy Study—HERMES study re-port I—study protocol¹¹</p>	<p>Patients with suspected retinal disease, undergo eye exam and optical coherence tomography (OCT) scans, will be recruited at 24 optometry practices in English. Optometry practices will be randomized to standard care or teleophthalmology</p>	<p>The result of an AI diagnostic study is diagnostic accuracy referral decisions made by Moor-fields-DeepMind AI. HERMES Study (Teleophthalmology-enabled and artificial intelligence-ready referral pathways for retinal disease community optometry referral is a prospective, multicenter implementation science study that assesses clinical utility, cost-effectiveness and human resources.</p>	<p>Computer interaction of Tele-Medicine and Artificial Intelligence Decision Support Systems in eye care referral pathways.</p>
7	<p>BMJ Open / Evaluation of a stand-alone mobile mindfulness app in people experiencing infertility: the protocol for an exploratory randomised controlled trial (MoMiFer-RCT)¹²</p>	<p>The latter will be evaluated through app tracking. People, including women, men and couples, experiencing infertility (n=60) will be randomised to an intervention group receiving the standalone mobile mindfulness app for 3 months or a wait-list control group. The app follows the format and content of Mindfulness-Based Stress Reduction. Data will be collected at base-line, at 1.5 months and 3 months after randomisation.</p>	<p>The primary outcomes are symptoms of emotional distress and fertility-related quality of life. Secondary outcomes are mindfulness skills, repetitive negative thinking, self-compassion, user-rated quality of the stand-alone mobile mindfulness app and use of the app. Experience sampling method and standardised self-report questionnaires are combined within a repeated measures design to measure the effects of the stand-alone mobile mindfulness app on the primary and secondary outcomes, apart from the use of the app.</p>	<p>Secondary outcomes are mindfulness skills, repetitive negative thinking, self-compassion, user-rated quality of the stand-alone mobile mindfulness app and use of the app.</p>
8	<p>International Journal of Environmental Research and Public Health (MDPI) / Digital Tools in Behavior Change Support Education in Health and Other Students: A Systematic Review¹³</p>	<p>A systematic literature review was conducted in PubMed, CINAHL, MED-LINE, Web of Science, SAGE, Scopus, and Cochrane Library databases and by reverse citation search. We used PRISMA 2020 guidelines to describe the search process for relevant literature.</p>	<p>The study used a variety of digital tools to increase students' knowledge of behavior change techniques individuals with chronic illnesses, leading to greater self-confidence, better cooperation, and practical experience and skills. The most common limitations felt in using this tool are time and space limitations.</p>	<p>leading to greater self-confidence, better cooperation, and practical experience and skills.</p>

9	<p>Wiley / Effectiveness of mobile health-based self-management application for posttransplant cares: A systematic review¹⁴</p>	<p>Methods: A systematic search was carried out on MEDLINE (via PubMed), Web Science, Scopus, and Science Direct from inception to November 2020. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statements used in this study. Comprehensive research was carried out using a combination of keywords and MeSH terms related to m-Health, empowerment, self-management, and transplantation. Two independent reviewers screened titles and abstracts, assessed full-text articles, and extracted data from articles that met inclusion criteria.</p>	<p>Two independent reviewers screened titles and abstracts, assessed full-text articles, and extracted data from articles that met inclusion criteria. All reviewed articles were divided into four categories, self-management (treatment adherence, adherence to medical regimen, and remote monitoring management). 62.5% of studies showed m-health use improved medication adherence and self-management in transplantation.</p>	<p>Self management (medication adherence, adherence to medical regimen, and remote monitoring), evaluation, interaction, and interface.</p>
10	<p>Nature Partner Journal / A systematic review of smartphone-based human activity recognition methods for health research¹⁵</p>	<p>In this article, we summarize existing approaches to smartphone-based HAR. For this purpose, we systematically searched Scopus, PubMed, and the Web Science for similar review articles published through December 2020 on the use of smartphones for HAR.</p>	<p>The conclusion is that smartphones are very suitable for HAR research in health sciences. For population-level impacts, Future research should focus on improving the quality of data collected, addressing missing data, and involving a more diverse set of participants, relaxing requirements about phone assignment, providing more complete documentation about study participants, and sharing source code of applied methods and algorithms .</p>	<p>Trust.</p>
11	<p>Nature Partner Journal / Cultural adaptation of internet- and mobile-based interventions for mental disorders: a systematic review¹⁶</p>	<p>In October 2020, the PsycInfo, MEDLINE, Embase, Cochrane Central Register of Controlled Trials, and Web of Science systematically searches for studies that culturally adapt IMI for mental disorders. Among the 9438 recordings played, we identified 55 eligible articles. We extracted 17 content, methodological, and procedural components of the culturally adapted IMI, with the aim of achieving these goals</p>	<p>Consider the specific situation and perspective of the target population. Compliance and effectiveness of the adapted IMI appear to be similar to the original IMI; however, no studies have conducted direct comparisons. The IMI taxonomy of cultural adaptations for mental health is presented for future research investigating the relevance and necessity of cultural adaptations.</p>	<p>A. Culture B. Psychological Intervention.</p>

	JMIR Mental Health / Examining the Effectiveness of Gamification in Mental Health Apps for Depression: Systematic Review and Meta-analysis ¹⁷	A total of 5597 articles were identified across five databases. After screening, 38 studies (n=8110 participants) remained for data extraction. Of these studies, 50 total comparisons between post-intervention mental health app intervention groups and control groups were included in this meta-analysis study.	A random effects model was conducted to examine the influence of mental health apps on depressive symptoms. The number of gamification elements in the application was included as a moderator. The results show effect sizes were moderate across all mental health apps where the mental health app intervention effectively reduced depression.	Gamification.
12	Pharmaceutical marketing: Directions for customer orientation (Article) ¹⁸	Trust with the company and customer risk perception are included as mediating and moderating variables respectively in the model. A Structural Equation Modeling (SEM) estimates the significance of the association.	This study found that perceived risk is significant and therefore perceived trust needs to be increased to make customers more satisfied. The study concludes that customer satisfaction is an important factor in the pharmaceutical market and marketing strategies aligned with the "SAVE" philosophy can help marketers significantly.	This study proposes to understand the factors that are critical for patient satisfaction in the Pharmaceutical Sector based on upcoming trends like targeted therapy, personalized medicine, etc. Important variables that capture patient perceptions of satisfaction such as drug quality, drug education quality, drug affordability, drug availability and drug quality are included in the model.
13	Pharmaceutical Marketing Ethics in Healthcare Quality for Patient Satisfaction: An Islamic Approach ¹⁹	This paper theoretically proposes the relationship between pharmaceutical marketing strategies and quality health services for patient satisfaction and re-searched with primary data. It also highlights the effects of mediation Islamic marketing mechanisms from an ethical context.	The findings reveal that there is a significant positive effect there is a relationship between pharmaceutical marketing ethics and partial Islamic marketing mechanisms mediate health quality.	Framework developed in this research needs to be tested in the future through other social factors. Innovation-based health services, pharmaceuticals The company plays a big role to contribute and develop in this industry.
14	Technology Acceptance of Home-Based Cardiac Telerehabilitation Programs in Patients With Coronary Heart Disease: Systematic Scoping Review ²⁰	Systematic Scoping Review We searched PubMed, CENTRAL, Embase, CINAHL, PsycINFO, and Scopus (from July 2021) for English language paper reporting empirical evidence on the acceptability of early phase home-based cardiac technology elerehabilitation in patients with coronary heart disease.	Thematic analysis was conducted to explore external variables influence the acceptability of home-based cardiac telerehabilitation can reduce the risk of significant data loss from studies included in our review.	the end user in this user-centered approach it also includes healthcare providers provides home-based cardiac telerehabilitation, evaluation acceptance of the technology from a provider perspective is not included because it is not the focus of this review.
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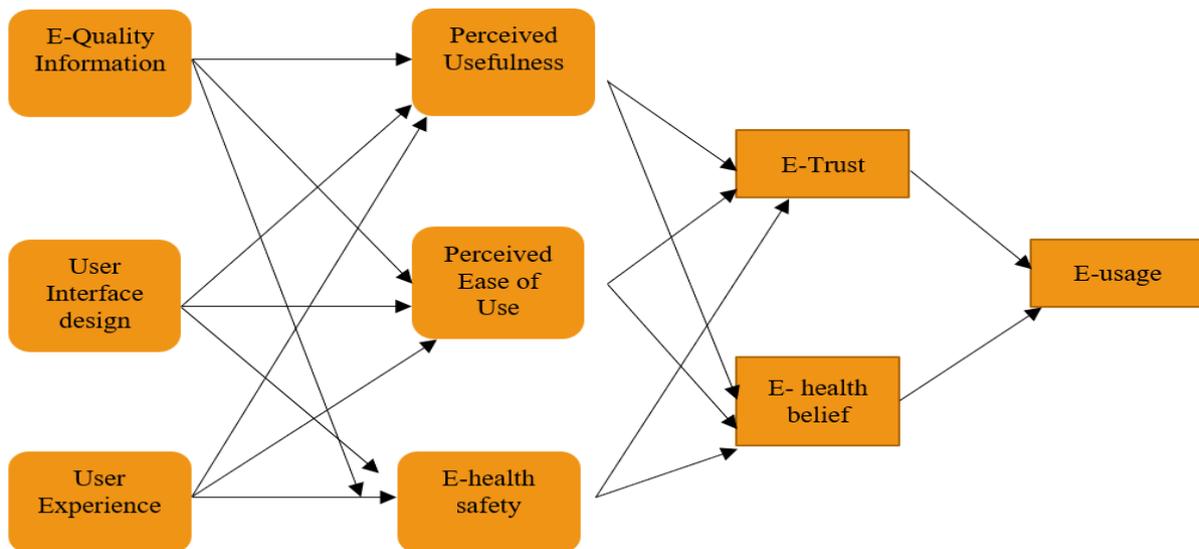


Figure 2. Other conceptual acceptance frameworks available in health care industry

5. Conclusion

A descriptive discussion of the components of the Technology Acceptance model in the health care industry is the relationship between external variables such as practical experience and skills on the usability of health technology which are connected and influenced by beliefs and culture that produce digital user behavior. For further research related to TAM, we can examine the influence of a country's culture on the behavioral model of accepting health technology.

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