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REVIEW ARTICLE

Cost-Effectiveness of Mobile Application Use in Managing Type 2 Diabetes Mellitus: A Systematic Review

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ABSTRACT

Introduction	Type 2 diabetes mellitus (T2DM) is a debilitating condition that imposes a significant economic burden on its management. This study aims to systematically review the published evidence on the cost-effectiveness of mobile health (mHealth) application interventions for T2DM.
Methods	A search strategy was conducted using electronic bibliographic databases, including PubMed, Web of Science and Scopus for published studies. The inclusion criteria included original articles that reporting cost-effectiveness evaluation studies on mHealth application interventions directed at patients diagnosed or at risk of T2DM, English-language articles and published in the year 2016 to 2020.
Results	A total of 6 eligible studies were selected. The cost savings per person for treating T2DM ranged from USD 1,346 to USD 3,781 per year. The major contributor to cost savings was reduced complication management resulting from good glycaemic control. The direct impacts of the intervention include reduced hospitalisation and fewer unplanned clinic visits, while diabetes-related mortality was indirectly reduced using mHealth.
Conclusions	The mHealth intervention was cost-effective in managing patients with T2DM. Implementation can be extended to other disease management areas to not only reduce total healthcare expenditure but also improve patients' quality of life.
Keywords	Cost-effectiveness; Economic Burden; mHealth; Mobile Application; Type 2 Diabetes Mellitus

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INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a chronic noncommunicable disease (NCD) that causes serious public health problems worldwide, particularly in developing countries such as Malaysia.[1] The number of adults living with diabetes worldwide has surpassed 800 million in 2022, more than quadrupling since 1990.[2] Global diabetes prevalence in adults aged 18 and older rose from 7% in 1990 to 14% in 2022, with the most rapid increases occurring in low- and middle-income countries.[3] In Malaysia, diabetes has reached critical levels, with the latest National Health and Morbidity Survey (NHMS) in 2023 reporting that 15.6% of adults, nearly one in six Malaysians, are now living with the disease[3]. These troubling statistics are largely due to the rising prevalence of T2DM, which accounts for 95 per cent of all diabetes worldwide, and an ageing population.[3]

Diabetes is a chronic disease that necessitates lifelong and intensive management to achieve good metabolic control.[5] If not treated promptly and effectively, diabetes can result in blindness, kidney failure, lower limb amputation, and stroke. Global diabetes-related mortality has escalated significantly, with the International Diabetes Federation (IDF) estimating that the disease was responsible for 3.4 million deaths in 2024 alone.[6] Worryingly, age-standardised mortality rates from diabetes increased by 3% between 2000 and 2019, with lower-middle-income countries experiencing the most significant rise in premature mortality.[4]

The Cost of Diabetes

Diabetes management and treatment are costly. The management and treatment of diabetes entail substantial economic costs, with global healthcare expenditure related to the disease estimated at USD 1.03 trillion in 2024 and projected to reach USD 1.05 trillion by 2045.[6] According to a 2020 report by the Malaysian Ministry of Health's Pharmaceutical Services Division, the direct medical cost of managing ambulatory patients with T2DM in public facilities is estimated at RM 2,684.24 (approximately USD 570) per patient per year. Furthermore, when accounting for out-of-pocket expenses and productivity losses, the total annual economic burden per patient escalates to approximately RM 3,747.12.[7] These expenses include direct healthcare expenses such as diabetes care, chronic diabetes complications, and general healthcare costs. The indirect costs of absenteeism, decreased productivity, disease-related unemployment, disability, and loss of productive capacity are estimated to be USD 90 billion.[6] As a result, mHealth and other medical technologies that aim to improve diabetes prevention, diagnosis, and management can be used to improve diabetes management and patient care.

Uberization of Healthcare

Currently, anyone with a smartphone has instant accessibility to information from anywhere. Consumers or smartphone users expect more from healthcare, which many experts believe will result in a significant consumer-driven transformation in care delivery models. Technology has evolved to enable what many refer to as the "Uberization" of healthcare, in which patients will have instant access to healthcare, like Uber or any other apps that allow instant access and online tracking for transportation services.[8] Malaysia is also one of the countries involved in the uberization of healthcare. In Malaysia, the use of mobile health (mHealth) technology is thought to contribute to disease management by encouraging patients' lifestyle modification and medication adherence through the provision of portable, everyday interventions to empower patients and encourage them to adhere to their management plans.[9]

Health and Diabetes

Digital platforms are adaptable to changing medical guidelines and can be translated across conditions. Mobile technologies such as cell phones or smartphones, tablets, and other wireless devices provide numerous opportunities for assisting and improving diabetes management by enabling remote patient monitoring and clinical advice delivery through a variety of functions (e.g. text messaging, web browsing, email, and videos).[10] With approximately 3.5 billion smartphone users globally, mHealth intervention was discovered to be significant in making diabetes treatment more significant and effective.[11] Diabetes management is well-suited to mHealth because it can provide frequent contact with patients and timely dissemination of health information, as well as facilitate glycemic control and guide self-management. Diabetes treatment and management can be more cost-effective when using mHealth. To the best of the researcher's knowledge, however, there is currently a lack of literature summarising the cost-effectiveness of mHealth interventions in T2DM treatment and management. The purpose of this study is to conduct a systematic review, analysis, and summary of the published evidence on the cost-effectiveness of T2DM mobile Health application interventions.

METHODS

Search Strategy

To ensure academic rigor and objectivity, the systematic review was conducted through a multi-stage validation process. The study was conceptualized and the protocol drafted by MNJ and AFAK. Initial title and abstract screening were

performed by NAMAH and SAMH, followed by a full-text eligibility assessment by FNI and NA. Data extraction was executed by MAIAZ and MFA, while NI performed the formal quality assessment using the Consensus Health Economic Criteria (CHEC) list. The entire process was supervised and validated by MRH, who resolved any discrepancies through consensus.

All relevant published articles were found using four databases: PubMed, Web of Sciences (WOS), Scopus, and Cochrane Library. All these databases are extensive, widely used for literature, and cover a wide range of scientific disciplines.[12] The articles were published between 2016 and 2020. Grey literature and unpublished studies were not included in this review.

The search strategy was developed based on the PICO framework: Population (patients with or at risk of T2DM), Intervention (mHealth applications), Comparison (standard or usual care without the addition of the mHealth intervention), and Outcome (cost-effectiveness or economic impact). To ensure comprehensive search, keywords were primarily focused on the Population, Intervention, and Outcome components, as 'standard care' comparisons are often implied in clinical and economic literature. The search terms (Table 1) were truncated to increase the number of relevant articles returned in our search.

Table 1 Search Strategy

Population	Diabetes OR Type 2 Diabetes OR Diabetes Mellitus OR T2DM OR DM2
Intervention	m-health OR ehealth OR mhealth OR mobile health OR application OR app AND monitor* OR control* OR management OR prevention OR risk reduction
Outcome	cost effective* OR cost-effective* OR cost benefit OR cost-benefit OR cost analysis OR cost-analysis OR economic evaluation OR cost* OR cost outcome

Inclusion and Exclusion Criteria

This review included all original articles that reported cost-effectiveness evaluation studies presenting data on mobile health application interventions directed at patients diagnosed with or at risk of T2DM, were written in English, and were published between 2016 and 2020. The inclusion criteria for this review were structured around the following study characteristics:

I. Study Design: We included trial-based economic evaluations (e.g., RCTs, cohort studies) and model-based evaluations (e.g., Markov models or decision trees).
II. Type of Economic Evaluation: Only full economic evaluations, including Cost-Effectiveness Analysis (CEA), Cost-Benefit Analysis (CBA), and Cost-Utility Analysis (CUA), were eligible.
III. Perspective: Studies reported from the healthcare system, society, or payer perspectives were included.
IV. Time Horizon and Discounting: Studies were included irrespective of time horizon; however, the presence of discounting (where applicable for horizons >1 year) was extracted as a quality indicator.

Studies were excluded if they reported only clinical outcomes without associated cost data or were simple cost-description studies without a comparator.

Data Extraction

Data extraction included identifying the economic evaluation design, categorised as either trial-based (analysis alongside a clinical trial) or model-based (e.g., Markov models or decision-analytic modelling). Studies were further classified by their economic evaluation type: Cost-Effectiveness Analysis (CEA), Cost-Benefit Analysis (CBA), or Cost-Minimisation Analysis (CMA). Furthermore, the review identified the perspective of each study (e.g., healthcare provider, societal, or patient) and the categories of costs measured, distinguishing between direct medical costs (hospitalisation, medication) and indirect costs (productivity loss).

Study Selection

Search results were imported to EndNote version 9, and duplicates were removed. After screening the titles of the selected articles, the abstracts were screened. The articles were then screened by reading the full articles before deciding on the final count of selected articles.

Data Extraction Tool

Using a standardised Excel spreadsheet, researchers independently extracted information for each article. Title, country, study design, objective, methodological approach, intervention, comparator, quality measurement tool, cost-effectiveness, cost-effectiveness factor (cost-effective vs not cost-effective), cost savings (USD), impact of cost savings, and reason not cost-effective were among the extracted data.

For comparative analysis, all reported costs were standardised to United States Dollars (USD). Currencies from non-US studies, specifically the Euro (€) for Danish and Finnish studies and the British Pound (£) for certain comparative metrics,

were converted based on the historical exchange rates of the respective publication years (2016–2019). This standardisation enables a uniform assessment of cost savings and incremental cost-effectiveness ratios (ICERs) across different healthcare systems.

Quality Assessment Tool

The quality of the selected articles was assessed using the Consensus Health Economic Criteria (CHEC) list, a checklist that can be used to critically appraise published economic evaluations.[13] This 19-point checklist covers reporting standards for economic model characteristics (population, time horizon, perspective, discount rate, and so on), cost and outcome identification and valuation, discussion points, conclusions, funding, and conflicts of interest. The CHEC-list was used to assess quality using a binary scoring system (1=Yes, 0=No) across 19 criteria. Total scores were categorised as Excellent (18-19), Good (14-17), Fair (10-13), or Poor (<10). By reviewing the source documents, the CHEC list was completed as described in Table 2.

RESULTS

The initial search yielded 1187 unique citations from four search engines, all of which were retrieved for further review. Following title screening and removing duplicates from the initial database search, another 1053 articles were shortlisted. Following the screening of abstracts, ten articles were selected for full-text review. Six articles met the data extraction and synthesis inclusion and exclusion criteria. The search flowchart in Figure 1 depicts the selection process.

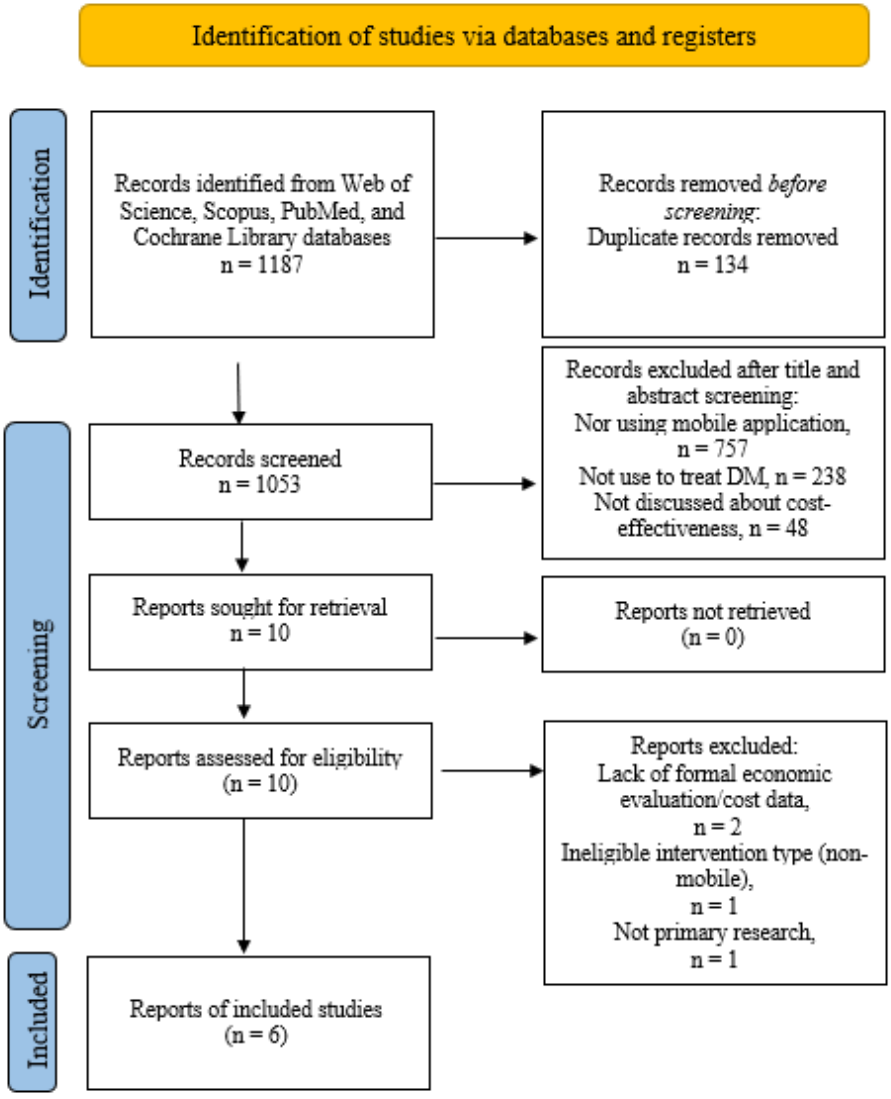

Figure 1 PRISMA flow diagram for systematic review

Study Characteristics

This systematic review included a total of six articles. All six studies were conducted in different countries and published between 2016 and 2019. Geographic distribution was led by the United States[16,19] and Australia,[17,18] contributing two articles each, while Denmark1[4] and Finland[15] each contributed one article. All six articles evaluated cost-effective outcomes. Most mHealth interventions used short message service (SMS) or other messaging methods to monitor and manage their diabetes patients in the study (4 studies). Three studies stated that they called their patients to provide care, such as motivational interviewing, glucose monitoring, and behavioural interventions. Another two studies used video calls as their intervention method, while one study used mobile application software as diabetes database monitoring. All studies compared their diabetes patients to a group of T2DM patients who were receiving standard care, whichwhich refers to routine outpatient care without mHealth intervention.

Study Quality

Most of the studies, according to the CHEC, are classified as good studies (score ranging from 14 to 17 out of 19 criteria). In other words, the standards for economic model characteristics were clearly described and reported in most of the studies (Table 2). Four studies, however, did not clearly mention the time horizon, and one study did not mention the study's perspective.[14-17]

Table 2 Summary of Studies with CHEC Scores and Methodological Approaches

No	Author	Year	Country	Methodological Approach	mHealth Name	Intervention	Comparator	CHEC-Score
1	Fasterholdt I et al.	2018	Denmark	Cost-effectiveness	Wound Telemonitoring	Video call, online written consultation	Patient attending clinic	14
2	Oksman E et al.	2017	Finland	Cost-effectiveness	TERVA (telephone-based health coaching intervention)	Motivational interviewing technique and coaching by telephone	Usual care	16
3	Bollyky JB et al.	2018	USA	Cost-effectiveness	Livongo Diabetes Program	Connecting patients with two-way messaging glucose meters, unlimited blood glucose (BG) test strips, and access to certified diabetes educators	Patient without intervention	17
4	Nordyke, et al.	2019	USA	Cost-effectiveness	Digital therapeutics (DTxs)	Mobile application software which provides behavioural interventions to patients with cardiometabolic and addictive conditions	Patient without mobile apps intervention	17
5	J. E. Varney et al.	2016	Australia	Cost-effectiveness	Diabetes Telephone Coaching	Telephone	Normal care	17
6	Robin Warren et al.	2017	Australia	Cost-effectiveness	Townsville Broadband Diabetes Telehealth	Telephone, video consultation, SMS	Usual care	17

Table 2b Detailed Methodological Quality Appraisal (CHEC-list)

No	CHEC Item / Quality Criteria	Fasterholdt et al[14]	Oksman et al[15]	Bollyky et al[16]	Nordyke et al[19]	Varney et al[18]	Warren et al[17]
1	Is the study population clearly described?	1	1	1	1	1	1
2	Are competing alternatives clearly described?	1	1	1	1	1	1
3	Is a well-defined research question posed in answerable form?	1	1	1	1	1	1
4	Is the economic study design appropriate to the stated objective?	1	1	1	1	1	1
5	Is the chosen time horizon appropriate to include relevant costs and consequences?	0	0	0	1	0	0
6	Is the actual perspective chosen appropriate?	1	0	1	1	1	1
7	Are all important and relevant costs for each alternative identified?	1	1	1	1	1	1
8	Are all costs measured appropriately in physical units?	1	1	1	1	1	1
9	Are costs valued appropriately?	1	1	1	1	1	1
10	Are all important and relevant outcomes for each alternative identified?	1	1	1	1	1	1
11	Are all outcomes measured appropriately?	1	1	1	1	1	1
12	Are outcomes valued appropriately?	1	1	1	1	1	1
13	Is an incremental analysis of costs and outcomes of alternatives performed?	1	1	1	1	1	1
14	Are all future costs and outcomes discounted appropriately?	0	1	1	1	1	1
15	Are all important variables, whose values are uncertain, appropriately subjected to sensitivity analysis?	1	1	1	1	1	1
16	Do the conclusions follow from the data reported?	1	1	1	1	1	1
17	Does the study discuss the generalizability of the results to other settings and patient/ client groups?	0	1	1	1	1	1

18	Does the article indicate that there is no potential conflict of interest of study researcher(s) and funder(s)?	0	1	1	0	1	1
19	Are ethical and distributional issues discussed appropriately?	0	0	0	0	0	0
	Total Score (out of 19)	14	16	17	17	17	17
	Quality Grade	Good	Good	Good	Good	Good	Good

Primary Objectives and Outcomes

Table 3 includes all the study's objectives. Fasterholdt and Gerström compared the costs and effects of telemonitoring (TM) versus standard monitoring (SM) in diabetic foot ulcer patients.[14] Oksman, Linna and Varney, Liew's studies[15,18] examined the cost-effectiveness of mHealth interventions. Another three studies were conducted

with the goal of evaluating the effect of mobile application intervention and estimating the economic impact of a digital behavioural intervention in T2DM.[16,17,19] The study results also differed from one another. In general, 5 out of 6 studies found that using mHealth or mobile applications to manage T2DM patients is cost-effective. However, one study discovered that mHealth interventions increased the cost of managing and treating T2DM patients.[15]

Cost Savings

Fasterholdt et al. found that telemonitoring costs €2039 ($2,400 USD) less than standard monitoring in treating diabetes foot ulcers.[14] The cost savings were due to fewer admissions and outpatient visits, and as the condition of the foot ulcer improved, more patients were able to avoid amputation. The incremental cost-effectiveness ratio (ICER) revealed that avoiding one amputation saved on average €67,973 ($80,208 USD). According to a study conducted by Bollyky and Bravata, connected health devices combined with lifestyle coaching can save between $113 and $179 per patient per month due to Glycated Haemoglobin (HbA1c) reduction, weight loss, good compliance, and an increase in patients' sense of empowerment and well-being about managing their diabetes[16]. This finding is consistent with the findings of J.E. Varney et al, who discovered that the intervention contributed to $3327 cost savings per patient. Cost savings of approximately $11,907 in treating complications contribute to significant cost savings in treating T2DM patients.[18] Nordyke and Appelbaum reported that using digital behavioural interventions in T2DM has a significant economic impact, with average Healthcare Resource Utilisation (HRU) savings ranging from $97 to $145 per patient per month, with higher potential benefits in T2DM.[19] Another study by Warren and Carlisle found that total healthcare costs in the intervention group were lower (mean $3781 vs. $4662) when compared to usual care.[17] This is due to the greater health benefit (lower HbA1c) compared to standard care (without intervention). However, Oksman and Linna[15] discovered a cost increase when treating T2DM patients with TERVA (telephone-based health coaching intervention). The average cost rose by about £160 ($206 USD) (£1948 ($2,512 USD) in the intervention group vs £1788 ($2,306 USD) in the control group). This is due to increased patient motivation for lifestyle changes and self-management following intervention. As a result, many patients spend more money on maintaining a healthy lifestyle (going to gym, hire a personal trainer, consume natural and organic foods, which are more expensive than conventional alternatives.

Table 3 Conclusions and findings of included studies

No	Author	Objective	Quality Assessment Tool	Cost Effective (Yes/No)	Cost savings	Impact Cost Savings	Reason Not Cost Saving
1	Fasterholdt et al[14]	To compare the costs and effects of telemonitoring (TM) with standard monitoring (SM) in individuals with diabetic foot ulcers	Consolidated Health Economic Evaluation Reporting Standards (CHEERS)	Yes	€2039 ($2,400 USD)	1. Better wound care 2. Less complication 3. Less invasive treatment 4. Less amputation	
2	Oksman et al[15]	To evaluate a cost-effectiveness analysis of a tele-based health-coaching intervention among patients with type 2 diabetes (T2D)	Health Related Quality of Life (HRQoL) measurement (15D instrument)	No	Mean cost (£): 1948 ($2,512 USD) (intervention) vs 1788 ($2,306 USD) (control)		Patient motivation improved, QALY improved, motivation to lifestyle changes and self-management are higher after intervention
3	Bollyky et al[16]	To evaluate the effects of lifestyle coaching for people diagnosed with type 2 diabetes in the setting of a connected glucose meter and Certified Diabetes Educator support	Not Mentioned	Yes	Ranging from $113 to $179 per member per month	1. HbA1C reduction weight loss 2. Good compliance increase patient's sense of 3. Empowerment and well-being about managing their diabetes.	
4	Nordyke et al[19]	To estimate the economic impact of a digital behavioural intervention in type 2 diabetes mellitus (T2DM)	Health resource utilization	Yes	Savings in T2DM are estimated at $83 per participant per month (PPPM) in year 1 and rise to $174 to $178 in years 2 and 3, total 3-year program costs of $6468 for DM	Better HbA1C control, less medication and chronic events, less hospitalisation	

5	Varney et al[18]	To assess the cost-effectiveness of telephone coaching, compared to usual diabetes care, in participants with poorly controlled T2DM	United Kingdom Prospective Diabetes Study (UKPDS) Outcomes Model	Yes	Cost savings of $3327 per participant	Time saving, better diabetes management
6	Warren et al[17]	To examine the effect of a telehealth intervention on the control of type 2 diabetes and subsequent potential cost-savings to the health system	Incremental Cost-effectiveness Ratio (ICER)	Yes	Mean $3781/ patient (intervention group) vs. $4662/ patient (control group)	Time saving, less inpatient/outpatient cost

DISCUSSION

T2DM is a multi-factorial chronic health condition that affects a large portion of the population, and the World Health Organisation predicts that the number of adults living with diabetes will rise.[20] The number of diabetes cases worldwide in quadruple from 108 million in 1980 to 422 million in 2014, and is expected to rise to 642 million by 2040.[21] This situation will place a significant financial burden on the healthcare system. According to Cho and Shaw in the International Diabetes Federation (IDF) Diabetes Atlas, the total global healthcare expenditure due to diabetes in 2017[22] was estimated to be between USD 727 billion and USD 850 billion. In 2045, the cost is expected to rise by 7%, bringing it from USD 776 billion to USD 958 billion. The costs include increased health-care utilisation as well as patient productivity loss or disability.

Most of the literature discussed the direct and indirect costs of diabetes treatment.[14,16,17,18,19] Direct medical costs are associated with resources used to manage an illness, such as hospitalisations, outpatient follow-ups, medications, laboratory investigations, and others. Other direct cost subdivisions include direct non-medical costs, which include costs incurred by patients, family members, or relatives, such as travel and meal expenses while in healthcare facilities.[23] In contrast, indirect costs in diabetes treatment are associated with paid or unpaid productive activities such as absenteeism, presenteeism, or reduced work productivity while working due to health conditions, reduced workforce participation due to disability, household productivity losses, and lost productivity due to premature mortality.[6]

As a result, new disease management methods should be introduced to improve patient care while also lowering the financial burden of diabetes treatment. Because mobile phone users account for nearly 95 per cent of the global population, using mobile applications is the best option for engaging diabetes patients.[24] Apart from that, mobile healthcare apps can be utilised for a wider range of purposes, including weight loss, mental health improvement, and the development of better sleeping habits.[16,18]

Nowadays, there are numerous mHealth or mobile applications available. Each mobile application in the six studies included in this review uses a different method to engage with patients in diabetic management. One goal of using mHealth intervention in diabetes management is to provide a platform for healthcare providers to continuously monitor and motivate their patients. Simultaneously, mHealth was used to encourage and empower patients to manage self-manage.[21] For example, in a study by Warren and Carlisle, diabetes telehealth methods were used to manage T2DM patients.[17] Their study demonstrated that using mHealth as an intervention reduced HbA1c in the intervention group from a median of 68 mmol/mol (8.4 per cent) to 58 mmol/mol (7.5 per cent), as well as the cost of treating the patient (mean $3781). This finding is consistent with the findings of Kitsiou and Paré, who found that mobile phone-based interventions are more effective than standard care or non-mHealth approaches in improving glycaemic control (HbA1c).[25]

Continuous reminder messages and motivation for behavioural and lifestyle changes assisted the patient in adhering to their management plan, resulting in significant HbA1C reduction[26]. SMS interventions were discovered to be more accessible than smartphone applications because they only require a basic cell phone with no cellular data or Wi-Fi, suggesting that these types of interventions may be more feasible in underserved populations.[27]

Video calls or video conferencing are another method used as mHealth interventions among T2DM patients.[14,17] Patients will be contacted via video call, allowing for virtual face-to-face management. Patients will be interviewed and given motivational support via video call as well. Video conferencing assists in maintaining quality care at the lowest possible cost to patients in at-home care settings. Monitoring combined with video conferencing has been shown to significantly reduce unscheduled clinic visits, hospital admissions, and hospital days.[28]

According to the findings of the six articles reviewed, there are factors that contribute to cost savings in managing T2DM patients using mHealth or mobile applications. Continuous monitoring and reminders sent via messages or SMS, as well as video conferencing with patients on a regular basis, can help control patient's HbA1C. Lowering HbA1C levels is associated with a lower risk of diabetes complications. Every 1% reduction in HbA1C reduces 21% of all diabetes complications, 21% of diabetes mortality, 14% of myocardial infarction, and 37% of microvascular complications.[29] Less complications will result in fewer unplanned clinic visits and hospitalisations.

All the researchers used tools to evaluate the effectiveness of their intervention. The selection of appropriate assessment tools for measuring health-related quality of life (HrQoL) is critical. These measurement tool components can provide new insights into the relationships between quality of life (QoL) and risk factors.[15] It will also help in public policy planning by determining the burden of disability caused by a specific disease.[30] Consolidated Health Economic Evaluation Reporting Standards (CHEERS)[14], Health Related Quality of Life (HRQoL) measurement (15D instrument),[15] Health Resource Utilisation,[19] United Kingdom Prospective Diabetes Study (UKPDS)

Outcomes Model[18], and Incremental Cost-effectiveness Ratio (ICER)[17] were used in this review. However, one study from Bollyky and Bravata did not mention any measurement tools used.[16]

Strengths and Limitation

This systematic review has many advantages. This study's methodology for searching articles from three widely used scientific search engines was rigorous. This review also included many studies conducted across a broad geographical area, increasing the generalizability of the findings. Furthermore, the tools used to measure cost-effectiveness and quality of life were reliable and valid, increasing the credibility of the results. Most importantly, this review highlights the critical role of mHealth as a resilient alternative for managing T2DM, a shift that was significantly accelerated by the COVID-19 pandemic. The global health crisis exposed the vulnerabilities of traditional face-to-face clinic visits and necessitated a rapid transition toward digital therapeutics. As healthcare systems worldwide move toward a 'digital-first' approach in the post-pandemic era, these findings provide an essential economic and clinical baseline for sustaining remote management of T2DM. However, this review included studies primarily conducted from healthcare system or payer perspective. Furthermore, because the studies included in the review are small, there may be some important component missing from the analysis, limiting comparability. Apart from that, the studies in this review are all based on developed western countries and no similar studies originated from other areas like Asian countries, hence applicability of these methods may slightly differ as other settings may be highly influenced by cultural or affected by economic differences.

CONCLUSION

In summary, most of the researchers discovered that using mobile applications or mHealth interventions to manage T2DM patients was cost-effective. Despite its contribution to total health expenditure, mobile health intervention will also help to reduce the burden on healthcare workers, particularly the hectic nature of daily diabetes clinic visits. More research into the cost-effectiveness or economic impact of mHealth interventions is needed for future planning and preparedness in managing T2DM effectively and efficiently.

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CONFLICT OF INTEREST

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