Appendix B. The Technology-enabled Self-Management (TES) Taxonomy applied to the 21 Meta-Analyses in Table 5

Attributes	Definition	Yang, S 2019[43]
Indication	Identifies who the intervention is for and who it is not for	Adults with T1D or T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Phone, SMS, video conferencing, web, email, chats, glucose meter
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	Telenursing interventions in RCTs that included: Automated telephone calls and nurse telephone follow-up, multifaceted nurse-coaching; nurse-led telephone coaching, monthly video conferences with a nurse-coaching intervention, synchronous or asynchronous communication and web-based intervention to improve diabetes outcomes. Outcomes measured: A1C, BMI, FBS, Cholesterol
	Communication: One-way, two-way, both	Both: one-way automated messages and two-way phone or video conferencing for education and follow-up
	PGHD: Data tracked, analyzed or both	Both: glucose in many studies, BP and weight data in some. Data self-report or uploaded via Bluetooth
	Education: General or tailored based on PGHD	Both: general education for self-care behaviors (checking glucose, taking medication etc) and tailored based on glucose, weight, BP
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	Both: How: real-time via phone calls or video calls; asynchronous via email, SMS, chat. Who: nurses and automated messages with a focus on improving glucose, weight and blood pressure

Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Not described
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	Nurses, live and automated
Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	Time-based to address reported problems and general self-care behaviors and goal setting Automated to conduct disease management assessment
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	3-18 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Wu, Y. 2017[39]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T1D or T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Mobile apps

Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that evaluate mobile apps for diabetes management. Mobile apps focused on diabetes management, lifestyle modification, medication management and complication prevention. Outcomes measured: A1C, hypoglycemia
	Communication: One-way, two-way, both	Both: Between participant and clinician and directly via the apps
	PGHD: Data tracked, analyzed or both	Both: Glucose was tracked and in 3 apps automated clinical decision support suggested therapeutic changes
	Education: General or tailored based on PGHD	Both: General education was provided via mobile apps and tailored via glucose data
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	Asynchronous via app Who: Both the care team and automated via app applying clinical decision support
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Not described
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	Via mobile apps
Frequency	Describes how often and when the intervention is delivered	Data driven based on logging
	Time-based: Daily, weekly, as needed, etc.	
	Data-driven	

Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	3-12 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Technical events included lack of automatic data transmission between glucose meter and mobile app. Four studies reported severe hypoglycemia. They described overall potential risk of interventions based on mobile apps that provided clinical decision support for treatment changes.

Attributes	**Definition**	**Huang, L. 2019[26]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T1D or T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Texting or SMS, phone, software, Internet
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that evaluate texting or SMS interventions for diabetes management. Messages included education, medication reminders, stress management and social support. Outcomes measured: A1C, fasting glucose, post-meal glucose
	Communication: One-way, two-way, both	Both
	PGHD: Data tracked, analyzed or both	Tracked
	Education: General or tailored based on PGHD	Both: Message categories included lifestyle education, smoking cessation, foot care and blood glucose monitoring; reminders for medication, stress management tips.

	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	Asynchronous: Seven studies made therapeutic adjustments based on glucose data. Who: individual/team
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Not described
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	Via phone, phone + Internet, software or system
Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	Time based varied from daily to weekly
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	3-12 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Faruque, L. 2017[21]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T1D or T2D

Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Telemedicine with electronic communication via web portals, smart devices, telephone, SMS, email, glucose meter uploads
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that compared telemedicine with usual care. Telemedicine interventions defined by (a) communication from patient to HCP (b) communication from HCP to patient, (c) type of HCP (d) frequency of contact and (e) characteristics of intervention. Outcomes measured: Primary A1C; QoL, hypoglycemia
	Communication: One-way, two-way, both	Two-way: Communication between HCP and patient included telephone, smartphone application, email, text messaging, SMS, and data sharing
	PGHD: Data tracked, analyzed or both	Both: Web portal for upload of blood glucose or other data and “smart” device or glucose meter that transmits data to HCPs
	Education: General or tailored based on PGHD	Both: General education about diabetes. Tailored based on exercise, blood pressure management, nutritional intervention and medication data
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	Asynchronous: Uploaded glucose data shared with HCPs for education and medication adjustment and clinical decision support system Who: individual/team, nurse, physician, allied health professional, and non-specialized support person

Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Not described
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	Multiple modalities for communication, both human and automated SMS and based on data.
Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	Time-based: Interactive communication was daily, weekly, bi-weekly, monthly or less. 33% of studies did not describe frequency.
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	3-18 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Aminuddin, H. 2019[19]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Smartphone (mobile phones, SMS and mobile applications)
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that compared the effectiveness of smartphone-based interventions with self-management components. Interventions included education, reminders, self-monitoring and feedback. Outcomes measured: Self-efficacy, self-care, QoL, clinical outcomes (A1C, BMI, BP)

	Communication: One-way, two-way, both	Both
	PGHD: Data tracked, analyzed or both	Both: Recording of self-monitoring data and algorithmic software
	Education: General or tailored based on PGHD	Both: Diabetes related, and self-care and feedback based on data
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Both: Reminders and feedback and healthcare recommendations based on self-care data input by HCP or identified by algorithmic software Who: individual/team,
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Not described
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	By HCP with automated software algorithms for support
Frequency	Describes how often and when the intervention is delivered	Time-based: Daily, twice daily, multiple times/week, weekly, monthly.
	Time-based: Daily, weekly, as needed, etc.	
	Data-driven	
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	Not described

Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Wu, I. 2018[40]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Smartphones
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that compared smartphone technologies with apps or Internet access or personal digital assistants to usual care. Interventions included collecting PGHD, feedback from HCPs, medication titration, self-care behavior monitoring, goal setting, medication reminders, glucose checking reminders, and diabetes education. Outcomes measured: A1C
	Communication: One-way, two-way, both	Both: Via smartphone
	PGHD: Data tracked, analyzed or both	Both: Glucose, steps, medication, other self-care metrics tracked. Multiple studies analyzed glucose data with algorithms and automatic feedback
	Education: General or tailored based on PGHD	Both: General education and tailored based on glucose data, pedometer data etc.
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Both: Smartphone messaging Who: HCPs or AI via database of messages

Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Both: Just in time with automatic messaging and by schedule
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCPs and automated
Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	Time-based: Daily most common, weekly, monthly Low intensity (less than 2/month or < 50% compliance), high intensity (>50% compliance) Data-driven by algorithms
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	2-24 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	No technology effects identified but hypoglycemia and hospitalization

Attributes	**Definition**	**Heitkemper, E. 2017[24]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T2D who were medically underserved or racial/ethnic minorities or in rural areas
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Health Information Technology (HIT)
Mechanism of Action	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that compared the effect of HIT DSMES that addressed at least one ADCES self-care behavior to

and Active Ingredients		usual care via including cellular/or automated phone, Internet, telemedicine, and computer software. Outcomes measured: Primary A1C; Secondary other physiological and psychosocial
	Communication: One-way, two-way, both	Both: Videoconferencing, telephone, text messages (real-time and automated), chat rooms, land lines most often with diabetes educator (diabetes care and education specialist).
	PGHD: Data tracked, analyzed or both	Tracked glucose and food diaries
	Education: General or tailored based on PGHD	Both: General DSMES covering ADCES self-management via Internet modules or videoconferencing. Tailored based on glucose data, language, literacy, numeracy, culture and technology literacy and included for goal setting and action planning
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Both: Interactive video conferencing and automated text messaging Who: A variety of HCPs including physicians, nurses, educators and research staff
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Scheduled based on intervention i.e. weekly online session, 2 phone calls by health educator, 13 DSMES sessions, 19 computer based multi-media lessons etc.
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCPs including physicians, nurses, educators, CHW etc. and some automated text responses
Frequency	Describes how often and when the intervention is delivered	Time based: By study intervention schedule
	Time-based: Daily, weekly, as needed, etc.	

	Data-driven	Data-driven: By automated texts with reminders
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	3 months to 5 years
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Shen, Y. 2018[33]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Internet-based interventions
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that compared the efficacy of Internet-based interventions on glycemic management compared to usual care including web-based, mobile technology, computer and data transmission equipment with connected glucometers in many studies. Outcomes measured: A1C
	Communication: One-way, two-way, both	Both: Telephone, videoconferencing, SMS by cell phone or Internet
	PGHD: Data tracked, analyzed or both	Both: Transmission of glucose data and analyzed by HCPs (other data including BP, weight, etc)
	Education: General or tailored based on PGHD	Both: General Internet based education and tailored based on logged data via Internet

	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How Both: Real time via video conferencing. Asynchronous: Internet, SMS, Web, automated algorithms generated by systems based on data. Who: Both HCPs and automated algorithms
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Intervention defined
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCPs, websites and automated
Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	Time based: By study intervention schedule
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	6 weeks to 5 years
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Tchero, H. 2019[36]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T1D and adults with T2D

Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Telemedicine interventions including websites, cellular phones, connected glucose meters, SMS
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that compared the efficacy of telemedicine interventions on glycemic management compared to usual care most often using connected glucose meters to upload data via web-based tools and use of SMS feedback and/or videoconferencing. Outcomes measured: A1C
	Communication: One-way, two-way, both	Both: SMS, video conferencing, telephone
	PGHD: Data tracked, analyzed or both	Both: Upload glucose data with analysis
	Education: General or tailored based on PGHD	Both: General self-management education and tailored messages via cell phone, SMS and video conferencing
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Both during video conference or web-based on SMS Who: Both HCPs and automated messages
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Scheduled based on intervention.
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCPs including nurses, pharmacists, educators (diabetes care and education specialists)

Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	Time based: By study intervention schedule Data-driven: By automated texts with reminders
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	4 weeks to 5 years
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Kuo, C. 2019[29]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Internet, computers, mobile phones
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that compared the effects of Internet empowerment-based self-management interventions on physiological and psychological outcomes. Interventions consisted of strategies for self-awareness, goal setting, action planning, problem solving and self-reflection via Internet, computers, and mobile phones. Outcomes measured: A1C, weight, self-care, empowerment, QoL, and BMI
	Communication: One-way, two-way, both	Both: Mobile phone, SMS, web-based

	PGHD: Data tracked, analyzed or both	Tracked: Self-care behaviors
	Education: General or tailored based on PGHD	Both: General self-management education and empowerment-based strategies based on assessment of PGHD
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Both real-time via telehealth and asynchronous via SMS and web-based Who: HCPs
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Scheduled based on intervention
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCPs
Frequency	Describes how often and when the intervention is delivered	
	Time-based: Daily, weekly, as needed, etc.	Time based: By study intervention schedule, some with SMS with reminders
	Data-driven	
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	2 weeks to 12 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	Definition	Liu, K. 2020[31]
Indication	Identifies who the intervention is for and who it is not for	Adults with T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Mobile apps with connected glucose meters, activity trackers
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that compared the effectiveness of mobile app-assisted self-care interventions. Mobile apps include device-based software that provide health-related information and support for self-care. Outcomes measured: Primary: A1C, BP, Secondary: behavioral, knowledge and psychosocial-related
	Communication: One-way, two-way, both	Both: Videoconferencing, mobile app, mobile phone
	PGHD: Data tracked, analyzed or both	Both: Logging of glucose, BP, medication, weight, self-care behaviors, mood and data analysis for visualization
	Education: General or tailored based on PGHD	Both: General education and based on analysis of tracked data with motivational messaging, goal management, counseling
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Asynchronous automated feedback based on self-monitoring data for personalized goal setting and reminders and for medication adjustment Who: Both HCPs and automated
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Scheduled based on intervention
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCPs including nurses, diabetes educators (diabetes care and education specialists), peer educators

Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	Time based: By study intervention schedule, some with SMS with reminders
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	2 to 12 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Tao, D. 2017[35]**
Indication	Identifies who the intervention is for and who it is not for	Adults and children with T1D and adults with T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Consumer-oriented health information technology (CHIT) telemedicine, mobile phone, SMS, connected glucose meters
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that evaluated the impact of CHIT on glycemic outcomes compared to usual care. CHIT include technologies, mobile apps and systems that provide access to data, information, recommendations and services for health promotion and healthcare focusing on self-management of glucose, insulin, food and other self-care behaviors. Outcomes measured: Primary: A1C
	Communication: One-way, two-way, both	Both: Telemedicine, mobile phone, SMS

	PGHD: Data tracked, analyzed or both	Both: Glucose and vital sign data logged or uploaded, with some analysis and feedback based on data including insulin titration
	Education: General or tailored based on PGHD	Both: General Internet based education and tailored based on data with feedback and reminders
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Asynchronous based on technology Who: Both HCPs and automated
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Scheduled based on intervention
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCPs including nurses, diabetes educators (diabetes care and education specialists)
Frequency	Describes how often and when the intervention is delivered	
	Time-based: Daily, weekly, as needed, etc.	Time based: By study intervention schedule, some with SMS with reminders
	Data-driven	Data-driven: Based on glucose and other self-monitoring data via automated messages
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	2 to 60 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	Definition	Michaud, T. 2020[32]
Indication	Identifies who the intervention is for and who it is not for	Adults with T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Mobile phone; connected devices for glucose, BP, fitness tracker; telehealth software; Internet, website
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that evaluated the effectiveness of telemonitoring that incorporates lifestyle change components including physical activity and healthy eating compared to usual care. Data automatically or manually uploaded (glucose, BP, weight and physical activity) to a HCP at an offsite monitoring location for evaluation and feedback. Outcomes measured: Primary: A1C and weight
	Communication: One-way, two-way, both	Both: Video consultation, cell phone, Text, SMS
	PGHD: Data tracked, analyzed or both	Both: Automated or manually uploaded glucose, BP or weight and physical activity, some with remote monitoring and automated feedback
	Education: General or tailored based on PGHD	Both: Self-management education focused on lifestyle change and tailored based on data uploaded
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Both: RT via videoconferencing, AS via technology and SMS Who: Both care team and AI

Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Scheduled based on intervention
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCPs including nurses, diabetes educators with some automated messages via SMS
Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	Time based: By study intervention schedule, some with SMS with reminders Data-driven: Based on remote-monitoring of glucose and other self-monitoring data via automated messages
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	6-9 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Haider, R. 2019[23]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Text/SMS
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that examine the effectiveness unidirectional text messaging focusing on lifestyle management compared to usual care. Intervention focused on medication taking behavior, self-care behaviors including glucose

		monitoring, self-efficacy, educational and motivational messaging. Outcomes measured: A1C
	Communication: One-way, two-way, both	One-way: Unidirectional text/SMS
	PGHD: Data tracked, analyzed or both	Both: Customized coaching based on glucose data, medication reminders and adjustments
	Education: General or tailored based on PGHD	Both: Self-management lifestyle education and tailored based on glucose data and self-reported barriers
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: AS for medication reminders, medication adjustment, motivational messages Who: Both care team generated and automated texts
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Scheduled based on intervention, some messages delivered based on data received
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	Text messages both human generated and automated
Frequency	Describes how often and when the intervention is delivered	
	Time-based: Daily, weekly, as needed, etc.	Time based: By study intervention schedule, some with SMS with reminders
	Data-driven	Data-driven: Some based on self-assessed barriers and self-management behaviors

Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	3-12 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Kirk, M. 2019[27]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Wearable physical activity devices (pedometer, accelerometer)
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that examine the effectiveness of wearable device interventions in improving physical health outcomes. Outcomes measured: Physical activity measures (steps), A1C
	Communication: One-way, two-way, both	Both: Telephone, text, SMS, email
	PGHD: Data tracked, analyzed or both	Tracked: Via wearable device
	Education: General or tailored based on PGHD	Both: General physical activity education along with individualized goal setting, evaluate strengths and barriers to physical activity
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Both live and via text/SMS Who: Both health coaching via phone and automated motivational prompts

Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Scheduled based on intervention, some messages delivered just in time
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCP and automated via Text, SMS, phone
Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	 Time based: By study intervention schedule, daily, weekly, biweekly, monthly Data-driven: some messages delivered based on data received
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	4 weeks to 1 year
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Hu, Y. 2019[25]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T1D and adults with T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Mobile apps
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that examine the effectiveness of mobile apps on self-management compared to usual care. The function of the mobile apps included insulin bolus calculators and to support self-management behavior changes.

		Outcomes measured: A1C
	Communication: One-way, two-way, both	Both: not well defined
	PGHD: Data tracked, analyzed or both	Both: not well defined
	Education: General or tailored based on PGHD	Both: General self-management and tailored based on data for medication changes
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Both not well defined Who: HCP and algorithms
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Scheduled based on intervention, HCP feedback varied from low to high frequency
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCP and automated via mobile app
Frequency	Describes how often and when the intervention is delivered	
	Time-based: Daily, weekly, as needed, etc.	Time based: By study intervention schedule, daily, weekly, biweekly, monthly
	Data-driven	
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	6 weeks to 12 months

Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Wang, X. 2019[37]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T1D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Mobile health interventions or text/SMS
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that examine the effectiveness of mobile health interventions or text messaging compared to usual care. Outcomes measured: A1C
	Communication: One-way, two-way, both	Both: via text/SMS or mobile app
	PGHD: Data tracked, analyzed or both	None described
	Education: General or tailored based on PGHD	None described
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Both Who: Automated
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Not defined

Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCP and automated via mobile app
Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	Not defined
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	3 to 12 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Wu, X. 2019[42]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T1D and adults with T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Mobile apps (connected glucose meters)
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that examine the clinical efficacy of mobile apps for lifestyle modifications compared to usual care. Lifestyle modifications including physical activity and healthy eating advice provided via apps. Outcomes measured: A1C, weight, BMI, other physiological outcomes
	Communication: One-way, two-way, both	Both: Text/SMS, email, phone calls
	PGHD: Data tracked, analyzed or both	Both: Glucose data uploaded and analyzed for medication adjustments and behavior change

	Education: General or tailored based on PGHD	Both: General self-management and tailored, personalized messages based on diabetes questions and self-management for positive reinforcement and personalized goal setting
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Both by phone and AS automated data driven feedback and medication reminders Who: Both HCPs and automated by apps
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Not clearly defined, some data driven
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCP and automated via mobile apps
Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	HCP feedback ranged from weekly to every 3 weeks. Data-driven based for medication adjustments
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	3 to 12 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	Definition	Wu, C. 2018[41]
Indication	Identifies who the intervention is for and who it is not for	Adults with T1D and T2D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Telehealth (Mobile phone, telephone, Internet, modem, Bluetooth)
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that examine the clinical outcomes of telehealth in diabetes management compared to usual care with a focus on large trials and duration > 6 months. Telehealth included one or more of tele-education, telemonitoring, teleconsultation, or tele-case management. Outcomes measured: Primary: A1C; Secondary: BP
	Communication: One-way, two-way, both	Both: Computer and phone calls
	PGHD: Data tracked, analyzed or both	Both: Glucose data uploaded and analyzed with feedback
	Education: General or tailored based on PGHD	Both: General self-management and tailored education on medication adjustments, physical activity and food. Education focused on motivation, self-efficacy and self-management
	Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	How: Both by phone, text/SMS, Internet, website or email Who: HCPs
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Not clearly defined, some data driven
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCP multi-disciplinary team and automated via data upload

Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	HCP feedback averaged weekly Data-driven based for medication adjustments
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	6 to 12 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Lee, S. 2017[03]**
Indication	Identifies who the intervention is for and who it is not for	Adults and children with T1D
Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Telemedicine (fax, SMS, Internet, modem, telephone, mobile phone or applications), connected glucose meter, one CGM study
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop:	RCTs that examine the clinical outcomes of telemedicine in diabetes management compared to usual care with telemedicine defined as medical information exchanged from one site to another via electronic communication including telemonitoring, tele-education, teleconsultation, tele-case-management, tele-mentoring. Outcomes measured: A1C
	Communication: One-way, two-way, both	Both: Phone, Text/SMS, mobile app
	PGHD: Data tracked, analyzed or both	Both: Glucose data uploaded and analyzed with feedback; online diabetes diary

	Education: General or tailored based on PGHD Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	Both: General self-management focused on healthy eating, complications, and medication. Tailored education based on assessment; and for medication adjustments and behavior change with problem solving. How: Both by phone, text/SMS, Internet, website or email Who: Both HCPs and immediate graphical feedback by AI
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Most delivered based on intervention schedule, some just in time based on data
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	HCP multi-disciplinary team and automated via data upload
Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc. Data-driven	Combination of high intensity and low intensity Time-based: HCP feedback (averaged weekly, some daily) Data-driven based for some based on glucose levels
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	6 to 12 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Attributes	**Definition**	**Wei, J. 2019[38]**
Indication	Identifies who the intervention is for and who it is not for	Adults with T2D

Technology Class	Describes the main technology device class (e.g., BGM, CGM, mobile apps, text messaging, insulin pump, pen devices, online peer support)	Telephone
Mechanism of Action and Active Ingredients	Provides a description of the intervention including individual components and desired outcomes, and defines the features of the TES Feedback loop: Communication: One-way, two-way, both PGHD: Data tracked, analyzed or both Education: General or tailored based on PGHD Feedback: How: Real-time, asynchronous, or both Who: Human (care team, interventionist) or technology (AI)	RCTs that compare the impact of telephone calls on self-management to improve glycemic and cardiovascular outcomes compared to usual care. Outcomes measured: Primary: A1C Secondary: weight, BP, cholesterol Two-way telephone calls Tracked: Patient kept logs and shared with nurses General: General education focused on glucose monitoring, healthy eating, physical activity and taking medication How: Real-time Who: Nurses
Dose	Describes how much of the intervention is delivered (e.g. just in time, accessible 24/7, anytime anywhere, front loaded with taper)	Range of 5-24 phone calls lasting 5-30 minutes.
Route	How the intervention is delivered (e.g., automated, human-augmented, or both) and who or what delivers it	Nurses via telephone
Frequency	Describes how often and when the intervention is delivered Time-based: Daily, weekly, as needed, etc.	Time-based: Based on intervention schedule

	Data-driven	
Duration	Describes how long the intervention is delivered. (e.g., 12-weeks, 6-months, maintenance, intermittent)	Average of 12 months
Adverse effects	Describes any untoward effects identified from the study (e.g., device malfunction vs user device issues, technical connectivity issue or Internet access)	Not described

Abbreviations: ADCES, Association of Diabetes Care and Education Specialists; AI, artificial intelligence; BGM, blood glucose monitoring; CGM, continuous glucose monitoring; CHIT, consumer health information technology; CHW, community health workers; DSMES, diabetes self-management education and support; HCP, healthcare professional; HIT, health information technology; PGHD, patient generated health data; SMS, short message service; TES, technology-enabled self-management T1D, type 1 diabetes; T2D, type 2 diabetes