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# Mobile health as a primary mode of intervention for women at risk of, or diagnosed with, gestational diabetes mellitus

Edwards, KJ

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JBI Evidence Synthesis

Lippincott, Williams & Wilkins

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	<b>mHealth name, type and country</b>	<b>mHealth intervention features</b>	<b>Evaluation method(s)</b>	<b>Implementation setting</b>	<b>Behavior Change Theory and No. of BCTS</b>
During pregnancy					
Self-management for BGC <sup>a</sup>	Pregnant + App (Norway)	<ul style="list-style-type: none"> <li>- Auto upload of BG<sup>b</sup> readings</li> <li>- Real-time visualization of BG levels</li> <li>- Information on healthy diet, PA<sup>c</sup> and diabetes</li> </ul>	<ul style="list-style-type: none"> <li>Development and usability<sup>34</sup></li> <li>Evaluation (RCT<sup>d</sup>)<sup>30</sup></li> <li>Evaluation (qualitative)<sup>55</sup></li> </ul>	Hospital setting (at diagnosis)	Health Belief Model  5
	GDMHealth App (UK)	<ul style="list-style-type: none"> <li>- Auto upload of BG readings</li> <li>- Real-time feedback on BG levels</li> <li>- Two way communication with HCP<sup>e</sup></li> </ul>	<ul style="list-style-type: none"> <li>Development and usability<sup>46</sup></li> <li>Pilot study<sup>43</sup></li> <li>Pilot study<sup>38</sup></li> <li>Evaluation (RCT)<sup>45</sup></li> </ul>	Hospital setting (at diagnosis)	3
	Glucose Buddy App (Israel)	<ul style="list-style-type: none"> <li>- Manual BG level upload</li> <li>- BG reports emailed direct to HCP via app</li> <li>- Feedback on BG levels, diet, treatment and appointments emailed to women</li> <li>- Two way interaction with HCP</li> </ul>	<ul style="list-style-type: none"> <li>Evaluation (RCT)<sup>47</sup></li> </ul>	Hospital setting (at diagnosis)	3
	dNurse App (China)	<ul style="list-style-type: none"> <li>- Manual BG level upload</li> <li>- Real-time feedback on BG levels</li> <li>- Two way connections with HCP</li> <li>- Information on diet, exercise and treatment</li> </ul>	<ul style="list-style-type: none"> <li>Evaluation (RCT)<sup>36</sup></li> </ul>	Hospital setting (at diagnosis)	4
	DiaMOnd App (Australia)	<ul style="list-style-type: none"> <li>- Manual upload of BG readings</li> <li>- Real-time feedback from HCP on BG diet,</li> </ul>	<ul style="list-style-type: none"> <li>Evaluation (cross over trial)<sup>58</sup></li> </ul>	Private Hospital setting (at diagnosis)	3

		<p>exercise and insulin titration.</p> <ul style="list-style-type: none"> <li>- Logs diet, PA and insulin use</li> </ul>			
	<p>GlucoseMamma App (USA)</p>	<ul style="list-style-type: none"> <li>- Manual upload of BG readings</li> <li>- Real-time feedback on BG levels</li> <li>- Positive text messaging</li> <li>- Information on healthy eating, recipes and meal plans</li> </ul>	<p>Evaluation (prospective RCT)<sup>32</sup></p>	<p>Hospital setting (at diagnosis)</p>	2
	<p>GEM App (Russia)</p>	<ul style="list-style-type: none"> <li>- Auto upload of BG readings</li> <li>- Logs dietary intake</li> <li>- Personalized advice on upcoming meals based on BG readings</li> </ul>	<p>Pilot study (mixed methods)<sup>51</sup></p>	N/A	2
	<p>Mother App (Australia)</p>	<ul style="list-style-type: none"> <li>- Manual BG level upload</li> <li>- BG levels viewed by HCP via online portal</li> </ul>	<p>Pilot study<sup>57</sup></p>	<p>Hospital setting (at diagnosis)</p>	2
	<p>Net Health App (Australia)</p>	<ul style="list-style-type: none"> <li>- Auto upload of BG readings</li> <li>- Two way interaction with HCP</li> <li>- Auto alert to HCPs if BG levels are out of range</li> </ul>	<p>Trial registration (pilot Non-RCT)<sup>50</sup></p>	<p>Hospital setting (at diagnosis)</p>	3
	<p>App (Korea)</p>	<ul style="list-style-type: none"> <li>- Auto upload of BG readings</li> <li>- Two way communication with HCP</li> <li>- Records dietary intake</li> <li>- Tailored in-app messaging</li> </ul>	<p>Pilot study (Pilot RCT)<sup>56</sup></p>	<p>Hospital setting (at diagnosis)</p>	3

	App ecosystem (New Zealand)	<ul style="list-style-type: none"> <li>- Food diaries, exercise tracking, glucose monitoring</li> <li>- Ability to export data to HCP</li> </ul>	Pilot study (qualitative) <sup>49</sup>	N/A	1
	App (Oman)	<ul style="list-style-type: none"> <li>- Health education and videos on PA, BG monitoring and diet</li> <li>- Tracks PA, diet and BG</li> <li>- Provides feedback charts</li> <li>- Daily reminders to monitor BG</li> </ul>	Trial registration (feasibility RCT) (SESSPA) <sup>37</sup>	Hospital setting (at diagnosis)	7
	MobiGuide App (Spain)	<ul style="list-style-type: none"> <li>- Auto upload of BG readings</li> <li>- Two way interaction with HCP via messaging</li> <li>- tracks PA via embedded accelerometer</li> </ul>	Pilot study (observational, prospective) <sup>53</sup>	Hospital setting (at diagnosis)	2
	App (South Korea)	<ul style="list-style-type: none"> <li>- Generates generic and tailored recommendations on BG management, PA, bodyweight and diet based on patient data and clinical guidelines</li> </ul>	Development and usability (mixed methods) <sup>39</sup>	Online diabetes group (at home)	2
Education	Educational App (Iran)	<ul style="list-style-type: none"> <li>- Reminders for tests and medication</li> <li>- Educational material in video photo and text format</li> </ul>	Evaluation (quasi-experimental with control) <sup>35</sup>	Hospital setting (at diagnosis)	4
Behavior change for healthy lifestyle	GDmHealth Plus app (UK)	<ul style="list-style-type: none"> <li>- Weekly self-weighing</li> <li>- Carbohydrate counting</li> <li>- PA monitoring</li> <li>- Real-time feedback via HCP</li> </ul>	Pilot study (mixed methods) <sup>33</sup>	Hospital setting (at diagnosis)	3
	Habits-GDM app (Singapore)	<ul style="list-style-type: none"> <li>- Tracks diet and PA</li> <li>- Interactive educational content</li> </ul>	Evaluation (RCT) <sup>59</sup>	Hospital setting (at diagnosis)	4

		-Lifestyle coaching via in-app messaging			
	mGDM app (Nepal)	- Health education - Identification and setting of health goals - Facilitates support from family members	Trial registration (RCT) <sup>52</sup>	Hospital setting (at diagnosis)	Social Cognitive Theory  3
	Stay Active App + ( Mackillop) (UK)	- Two way interaction with HCP - Remote motivational interviewing - PA goals can be reviewed - feedback via messaging	Trial registration (feasibility) <sup>44</sup>	Hospital setting (at diagnosis)	4
Postpartum					
Education	Tu Puedes app (USA)	- 4 'lessons' about T2DM prevention - Culturally applicable information	Pilot study (quasi-experimental with control) <sup>31</sup>	N/A	1
Behavior change for T2DM <sup>f</sup> prevention	nBuddy App (Singapore)	- Tracks diet and exercise with visual feedback - Personalized education - Two way communication with health and lifestyle coach	Evaluation (RCT) <sup>42</sup>	Hospital setting (at delivery)	5
	Triangle App (Germany)	N/A	Trial registration (RCT) <sup>41</sup>	N/A (3-8 months postpartum)	N/A
	Health-e mums app + social media (Australia)	- Tracks weight, exercise and dietary intake - Feedback via push notifications - Virtual health coach guides through 7 educational modules	Pilot Study (qualitative) <sup>48</sup>	N/A	7
	VR <sup>g</sup> program (South Korea)	- 123 exercise options - Nutrition program	Evaluation (quasi-experimental with control) <sup>40</sup>	Hospital setting (at delivery)	5

		<ul style="list-style-type: none"> <li>- Ability to track diet with visual feedback</li> <li>- Stress relief exercises</li> <li>- neonatal first aid program</li> </ul>			
	Hola Bebe, Adios Diabetes App  (USA)	<ul style="list-style-type: none"> <li>- Educational videos on PA and diet</li> <li>- Personalized action plans</li> <li>- Educational and motivational messages</li> <li>- Weight tracking</li> <li>- Recipes</li> <li>- Badge based reward system</li> </ul>	Pilot study <sup>54</sup>	Community Health Centre (up to 5 years postpartum)	Social Cognitive Theory  7

Table 1. Characteristics of mHealth for use during and after pregnancy

<sup>a</sup> BGC – blood glucose control

<sup>b</sup> BG – blood glucose

<sup>c</sup> PA- physical activity

<sup>d</sup> RCT – randomized control trial

<sup>e</sup> HCP – healthcare professional

<sup>f</sup> T2DM – type 2 diabetes mellitus

<sup>g</sup> VR – virtual reality