Supplementary Materials – Appendix A

Search Strategy by Database

Table A1. Search Terms: PubMed

Terms for E-health	Terms for pain/pain conditions	Terms for assessment/intervention	Terms for pediatrics
Title/abstract:	Title/abstract:	Title/abstract:	Title/abstract:
Ehealth or e-health Mobile health or mhealth or m-health ICT (*internet and communications technology*) e-pain computer* technolog* software internet* world wide web web-based email or e-mail online phone* mobile* cellphone* or cell phone* apps smartphone* or smart phone* text messag* texting SMS	Pain* Fibromyalgia Irritable bowel syndrome Arthrit* Osteoarthrit* Headache* Migraine* Neuralgi* Neuropath* Complex regional pain syndrome Needle* inject* immuni* vaccin* Blood draw	Intervention* Therap* Psychotherap* Selfmanag* or self-manag* Assist* Treat* Assess* Measure* Monitor* Track*	Child* Adolescen* Teen* Youth* Infant* Pediatric* Paediatric* Newborn New-born Baby Toddler* Minors Boy Boys Boyhood Girl Girls Girlhood Kid Kids Schoolchild* Juvenil*

MeSH Terms:	MeSH Terms:	MeSH Terms:	MeSH Terms:
Internet (Exp)	Pain (Not Exp)	Pain measurement (Not Exp)	Child (Exp)
Cell Phones (Exp)	Chronic Pain (Exp)	Assessment, pain (Not Exp)	Child, preschool (Exp)
Computers, Handheld (Exp)	Fibromyalgia (Not Exp)	Psychotherapy (Not Exp)	Adolescent (Exp)
	Irritable Bowel Syndrome (Not Exp)	Management, pain (Not Exp)	Infant (Exp)
	Arthritis (Not Exp)	Therapy, computer assisted (Exp)	Pediatrics (Exp)
	Osteoarthritis (Not Exp)		
	Headache (Not Exp)		
	Migraine (Not Exp)		
	Neuralgia (Not Exp)		
	Peripheral Nervous System Diseases (Not Exp)		
	Complex Regional Pain Syndromes (Not Exp)		
	Needles (Exp)		
	Acute pain (Exp)		
	Pain, Postoperative (Exp)		

Note. Exp = exploding

Table A2. Search Terms: PsycINFO

Terms for E-health	Terms for pain/pain conditions	Terms for assessment/intervention	Terms for pediatrics
Title/abstract:	Title/abstract:	Title/abstract:	Title/abstract:
Ehealth or e-health Mobile health or mhealth or m-health ICT (*internet and communications technology*) e-pain computer* technolog* software internet* world wide web web-based email or e-mail online phone* mobile* cellphone* or cell phone* apps smartphone* or smart phone* text messag* texting SMS	Pain* Fibromyalgia Irritable bowel syndrome Arthrit* Osteoarthrit* Headache* Migraine* Neuralgi* Neuropath* Complex regional pain syndrome Needle* inject* immuni* vaccin* Blood draw	Intervention* Therap* Psychotherap* Selfmanag* or self-manag* Assist* Treat* Assess* Measure* Monitor* Track*	Child* Adolescen* Teen* Youth* Infant* Pediatric* Paediatric* Newborn New-born Baby Toddler* Minors Boy Boys Boyhood Girl Girls Girlhood Kid Kids Schoolchild* Juvenil*
Thesaurus Terms:	Thesaurus Terms:	Thesaurus Terms:	Thesaurus Terms:
Internet (Exp) Cellular Phones (Not Exp) Computers (Exp)	Pain (Exp) Chronic Pain (Not Exp) Fibromyalgia (Not Exp)	Pain Measurement (Not Exp) Psychotherapy (Not Exp)	Pediatrics (Not Exp)

	Irritable Bowel Syndrome (Not Exp) Arthritis (Not Exp) Headache (Not Exp) Migraine Headache (Not Exp) Neuralgia (Not Exp) Peripheral Neuropathy (Not Exp) Complex Regional Pain Syndrome (Type I) (Not Exp) Injections (Exp) Immunization (Not Exp)	Pain Management (Not Exp) Computer Assisted Therapy (Not Exp) Online Therapy (Not Exp)	

Table A3. Search Terms: CINAHL

Terms for E-health	Terms for pain/pain conditions	Terms for assessment/intervention	Terms for pediatrics
Title/abstract:	Title/abstract:	Title/abstract:	Title/abstract:
Ehealth or e-health	Pain*	Intervention*	Child*
Mobile health or mhealth or	Fibromyalgia	Therap*	Adolescen*
m-health	Irritable bowel syndrome	Psychotherap*	Teen*
ICT (*internet and*	Arthrit*	Selfmanag* or self-manag*	Youth*
communications technology)	Osteoarthrit*	Assist*	Infant*
e-pain	Headache*	Treat*	Pediatric*
computer*	Migraine*	Assess*	Paediatric*
technolog*	Neuralgi*	Measure*	Newborn
software	Neuropath*	Monitor*	New-born
internet*	Complex regional pain	Track*	Baby
world wide web	syndrome		Toddler*
web-based	Needle*		Minors
email or e-mail	inject*		Boy
online	immuni*		Boys
phone*	vaccin*		Boyhood
mobile*	Blood draw		Girl
cellphone* or cell phone*			Girls
apps			Girlhood
smartphone* or smart phone*			Kid
text messag*			Kids
texting			Schoolchild*
SMS			Juvenil*
CINAHL Headings:	CINAHL Headings:	CINAHL Headings:	CINAHL Headings:
Internet (Exp)	Pain (Exp)	Pain Measurement (Not Exp)	Child (Exp)
Cellular Phone (Exp)	Chronic Pain (Not Exp)	Psychotherapy (Not Exp)	Child, Preschool (Not Exp)
Computers, Hand-Held (Exp)	Fibromyalgia (Not Exp)		Adolescence (Exp)

	Irritable Bowel Syndrome (Not Exp) Arthritis (Not Exp) Osteoarthritis (Not Exp) Headache (Not Exp) Migraine (Not Exp) Neuralgia (Not Exp) Peripheral Nervous System Diseases (Not Exp) Complex Regional Pain Syndromes (Not Exp) Needles (Not Exp) Postoperative Pain (Not Exp)	Pain Management (Not Exp) Therapy, computer assisted (Exp)	Infant (Exp) Pediatrics (Not Exp)

Table A4. Search Terms: EMBASE

Terms for E-health	Terms for pain/pain conditions	Terms for assessment/intervention	Terms for pediatrics
Title/abstract:	Title/abstract:	Title/abstract:	Title/abstract:
Ehealth or e-health	Pain*	Intervention*	Child*
Mobile health or mhealth or	Fibromyalgia	Therap*	Adolescen*
m-health	Irritable bowel syndrome	Psychotherap*	Teen*
ICT (*internet and*	Arthrit*	Selfmanag* or self-manag*	Youth*
communications technology)	Osteoarthrit*	Assist*	Infant*
e-pain	Headache*	Treat*	Pediatric*
computer*	Migraine*	Assess*	Paediatric*
technolog*	Neuralgi*	Measure*	Newborn
software	Neuropath*	Monitor*	New-born
internet*	Complex regional pain	Track*	Baby
world wide web	syndrome		Toddler*
web-based	Needle*		Minors
email or e-mail	inject*		Boy
online	immuni*		Boys
phone*	vaccin*		Boyhood
mobile*	Blood draw		Girl
cellphone* or cell phone*			Girls
apps			Girlhood
smartphone* or smart phone*			Kid
text messag*			Kids
texting			Schoolchild*
SMS			Juvenil*
Emtree Terms:	Emtree Terms:	Emtree Terms:	Emtree Terms:
Internet (Exp)	Pain (Exp)	Pain Measurement (Not	Child (Exp)
Mobile Phone (Exp)	Chronic Pain (Exp)	Exp)	Child, preschool (Exp)
Personal Digital Assistant	Fibromyalgia (Not Exp)	Pain Assessment (Not Exp)	Adolescent (Exp)

(Exp)	Irritable Colon (Not Exp) Arthritis (Not Exp) Osteoarthritis (Not Exp) Headache (Not Exp) Migraine (Not Exp) Neuralgia (Not Exp) Peripheral Neuropathy (Not Exp) Complex Regional Pain Syndrome (Not Exp) Needle (Exp) Postoperative Pain (Exp)	Psychotherapy (Not Exp) Analgesia (Not Exp) Computer Assisted Therapy (Exp)	Infant (Exp) Pediatrics (Exp)

Appendix B
Author Survey Questions

Availability
1. Is your e-health tool currently available for any use (e.g., to the general public, to patients of a particular health system, other end users, etc.)?
   a. Yes
   b. No

If yes, the tool is currently available
2. To whom is the tool currently available?
   a. General public (e.g., anyone can visit the website or download the app)
   b. Patients of a particular health system/clinic/etc. (please specify)

   _____
   c. Other (please specify) _____

3. Where is it available? (e.g., Apple app store? Android app store? Website?)
   _____

4. Is the tool available for free, or at a cost?
   a. Free
   b. Cost
      i. If cost – how much does it cost? _____
   c. Prefer not to answer

5. Who owns this tool?
   a. Yourself
   b. Your institution
   c. Other (please specify) _____
   d. I do not know

6. Have efforts been made to commercialize this tool? (i.e., to make it available for profit)
   a. Yes
      i. What steps have been taken to commercialize the tool?
      _____
      _____
   b. No
   c. I do not know

7. [1]Please indicate whether each of the following factors has facilitated making your e-health tool available to end users using the following response options: strongly agree, agree, neutral, disagree, strongly disagree, or prefer not to answer.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Prefer not to answer
a. Support in mitigating any perceived risks to commercializing/making the tool available						
b. Protected time for these activities						
c. Financial support						
d. Infrastructure support through institution						
e. University policies, procedures, and/or regulations						
f. Federal policies, procedures, and/or regulations						
g. Industry partnerships						
h. Commercialization allowances (e.g., within contractual agreements with industry partners)						
i. Support regarding intellectual property concerns						
j. Tool had promising clinical/commercial application						
k. Belief that making tool available is important to academia						
l. Belief that making tool available is important to your research field						
m. Belief in benefit to society/target population						
n. Information or training about how to commercialize/make tool						

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[1] Question 7 is modified from surveys used by Locke et al., 2002 and Vanderford et al., 2013

available						
o. Personal interest in commercialization/making available						
p. Support in updating technology of tool						
q. Student or other team member interest in commercialization/making tool available						

8. Were there any other factors that facilitated making this tool available to the public? If so, what were those factors?

_____

_____

If no, the tool is not currently available

9. [2]Please indicate whether each of the following factors has impeded making your e-health tool available to end users using the following response options: strongly agree, agree, neutral, disagree, strongly disagree, or prefer not to answer.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Prefer not to answer
a. Perceived risks to commercializing/making tool available						
b. Lack of time						
c. Lack of funding						
d. Lack of infrastructure to support						
e. University policies, procedures, and/or regulations						
f. Federal policies, procedures, and/or regulations						
g. Lack of industry partners						
h. Partnership restrictions (e.g., contractual agreements with partners)						
i. Intellectual property						

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[2] Question 9 is modified from surveys used by Locke et al., 2002 and Vanderford et al., 2013

concerns						
j. Tool had limited/no clinical/commercial application						
k. Perceived lack of importance to academia						
l. Perceived lack of importance to your research field						
m. Perceived lack of benefit to society/target population						
n. Not aware of how to commercialize/make tool available						
o. No interest in commercializing/making available						
p. Outdated technology of tool						
q. Student-led project, no follow up						

10. Were there any other barriers that have impeded making the tool available to the public? If so, what were those factors?

_____

_____

_____

Grant funding for the support of this project

11. What sources of grant funding were used in the development/testing of this e-health tool? What was the amount provided by each grant?

Source: _____ Amount: _____ Currency: ___
Source: _____ Amount: _____ Currency: ___
Source: _____ Amount: _____ Currency: ___
Source: _____ Amount: _____ Currency: ___
Source: _____ Amount: _____ Currency: ___
Source: _____ Amount: _____ Currency: ___
Source: _____ Amount: _____ Currency: ___
Source: _____ Amount: _____ Currency: ___
Source: _____ Amount: _____ Currency: ___
Source: _____ Amount: _____ Currency: ___

☐ Prefer not to answer

If the tool is available to the public:
12. Approximately how much grant funding was used in making the product available to end users? (If unsure, please provide your best estimate)
    a. Amount: _____ Currency: _____
    b. Prefer not to answer

13. Did the principal investigator include funding in the original grant budget to make this tool available to end users?
    a. Yes
    b. No
    c. I do not know

14. Was making the tool available to end users an expectation of the grant funding?
    a. Yes
    b. No
    c. I do not know

15. Were other funding sources obtained for making the tool available?
    a. Yes
    b. No
    c. I do not know

Development of the tool
16. Was this tool designed and developed in house, or did you contract out those services?
    a. In house
    b. Contracted out
        i. To whom?
            i. Private company
            ii. Student
            iii. Freelancer
            iv. Other (please specify) _____
            v. Prefer not to answer

17. [3]Please answer yes or no to the following questions about the <u>design process</u> for your tool:
    a. Were potential end users involved in any steps to help you understand users and their needs? Such steps could include a formal or informal needs assessment, ethnographic observation of existing practices, or other activities.
        i. Yes (if yes, what did you do: _____)
        ii. No
    b. Were potential end users involved in any steps of developing a prototype? Such steps could include storyboarding, reviewing the draft design or content prior to starting to develop the tool, or designing/developing a prototype.
        i. Yes (if yes, what did you do: _____)
        ii. No

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[3] Question 17 is the UCD-11 developed by Witteman et al., 2017

c. Were potential end users involved in any steps intended to evaluate the tool? Such steps could include feasibility testing, usability testing, a randomized controlled trial of the tool, or other activities.
   i. Yes (if yes, what did you do: _____)
   ii. No
d. Were potential end users asked their opinions of the tool in any way? For example, they might be asked to voice their opinions in a focus group, interview, or through other methods.
   i. Yes (if yes, what did you do: _____)
   ii. No
e. Were potential end users observed using the tool in any way? For example, they might be observed in a think-aloud study, through passive observation, logfiles, or other methods?
   i. Yes (if yes, what did you do: _____)
   ii. No
f. Did the development process have 3 or more iterative cycles? The definition of a cycle is that your team developed something and showed it to at least one person outside the team before making changes.
   i. Yes (if yes, how many cycles did you have: _____)
   ii. No
g. Were changes between iterative cycles explicitly reported in any way? For example, you might have explicitly reported them in a paper or technical report.
   i. Yes (if yes, what did you do: _____)
   ii. No
h. Were health professionals asked their opinion of the tool at any point?
   i. Yes (if yes, what did you do: _____)
   ii. No
i. Were health professionals consulted at any point before a first prototype was developed?
   i. Yes (if yes, what did you do: _____)
   ii. No
j. Were health professionals consulted between initial and final prototypes?
   i. Yes (if yes, what did you do: _____)
   ii. No
k. Was an expert panel involved? An expert panel is typically an advisory panel composed of experts in areas relevant to your tool; for example, pediatricians, plain language experts, designers, etc.
   i. Yes (if yes, who was involved: _____)
   ii. No

Other
18. Is there any other information you would like to share about the development or availability of your e-health tool?

_____

_____

Demographics[4]
19. How would you describe your current career stage?
     a. Trainee
     b. Postdoctoral fellow
     c. Early career (less than 10 years)
     d. Mid career (10-20 years)
     e. Senior career (more than 20 years)
     f. Prefer not to answer
20. Are you currently working primarily as a:
     a. Researcher
     b. Clinician
     c. Other
     d. Prefer not to answer
21. What is your main affiliation?
     a. Academic institution
     b. Research centre
     c. Hospital
     d. Private company
     e. Patient organization
     f. Freelance
     g. Other
     h. Prefer not to answer
22. What is your research discipline?
     a. Anesthesia
     b. Nursing
     c. Pharmacy
     d. Psychology
     e. Psychiatry
     f. Other (please specify) _____
     g. Prefer not to answer

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[4] Questions 19-22 were modified from Altsitsiadis et al., 2015