

Effectiveness and perceptions of asynchronous digital health for routine asthma care: a mixed-methods systematic review

¹Nazim Uzzaman, ¹Vicky Hammersley, ¹Kirstie McClatchey, ²Jessica Sheringham, ^{1,3}GM Monsur Habib, ¹Hilary Pinnock

¹University of Edinburgh; ²University College Hospital, London; ³Bangladesh Primary Care Respiratory Society

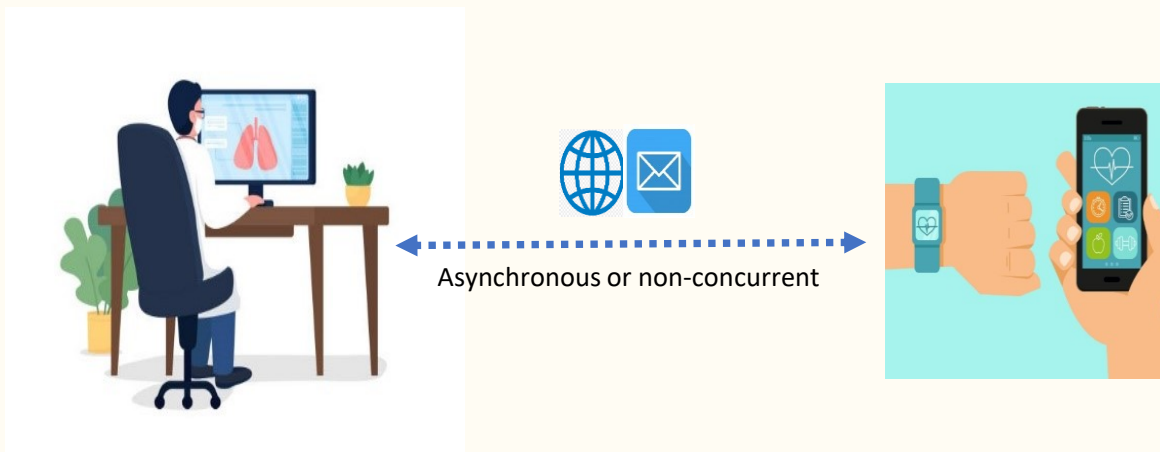


THE UNIVERSITY of EDINBURGH

usher institute

Introduction

- Asynchronous digital health (e.g., online portal, text, email) can overcome practical barriers, such as time constraints associated with in-person and remote synchronous consultations
- Little is known about the effects and acceptability of asynchronous digital health to support care for individuals with asthma (e.g., routine asthma care)
- Aimed to systematically review the qualitative and quantitative evidence on the use of asynchronous digital health for reviewing asthma.



What does "Reviewing Asthma" mean?

- Exchange of relevant information or notes between patients/caregivers and HCPs +
- Use of any forms of digital health technologies +
- Asynchronous communications, which may or may not involve other modes of communication

Methods

- Adhered to Cochrane methodology, used PRISMA guidelines, and followed results-based convergent design
- Searched six databases (January 2001 to July 2022)
- Methodological quality assessment tools: RoB2, Downs and Black checklist, MMAT, CASP
- Assessed confidence in evidence using GRADE and GRADE CERQual
- Data analysis: meta-analysis (trial data), thematic analysis (qualitative data), narrative synthesis (others)

PLOS ONE

Asynchronous digital health interventions for reviewing asthma: A mixed-methods systematic review protocol

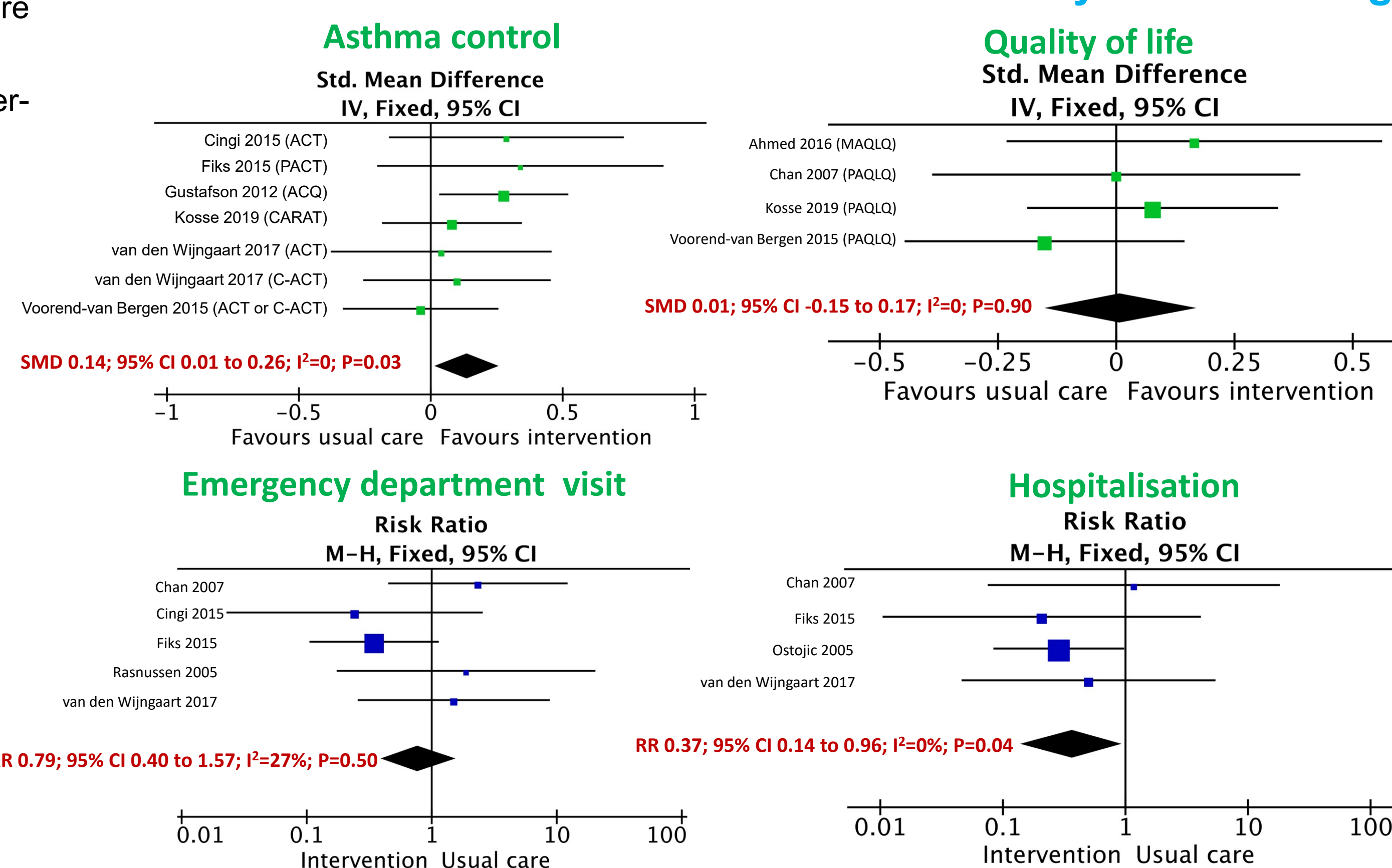
Md. Nazim Uzzaman, Vicky Hammersley, Kirstie McClatchey, Jessica Sheringham, G. M. Monsur Habib, Hilary Pinnock

Published: February 9, 2023 • <https://doi.org/10.1371/journal.pone.0281538>

Results

- 3428 people with asthma (and/or their caregivers) female: 47%, age: 4-69 years), and 140 healthcare professionals
- From 9 countries: high income: n= 28, upper-middle-income: n=2

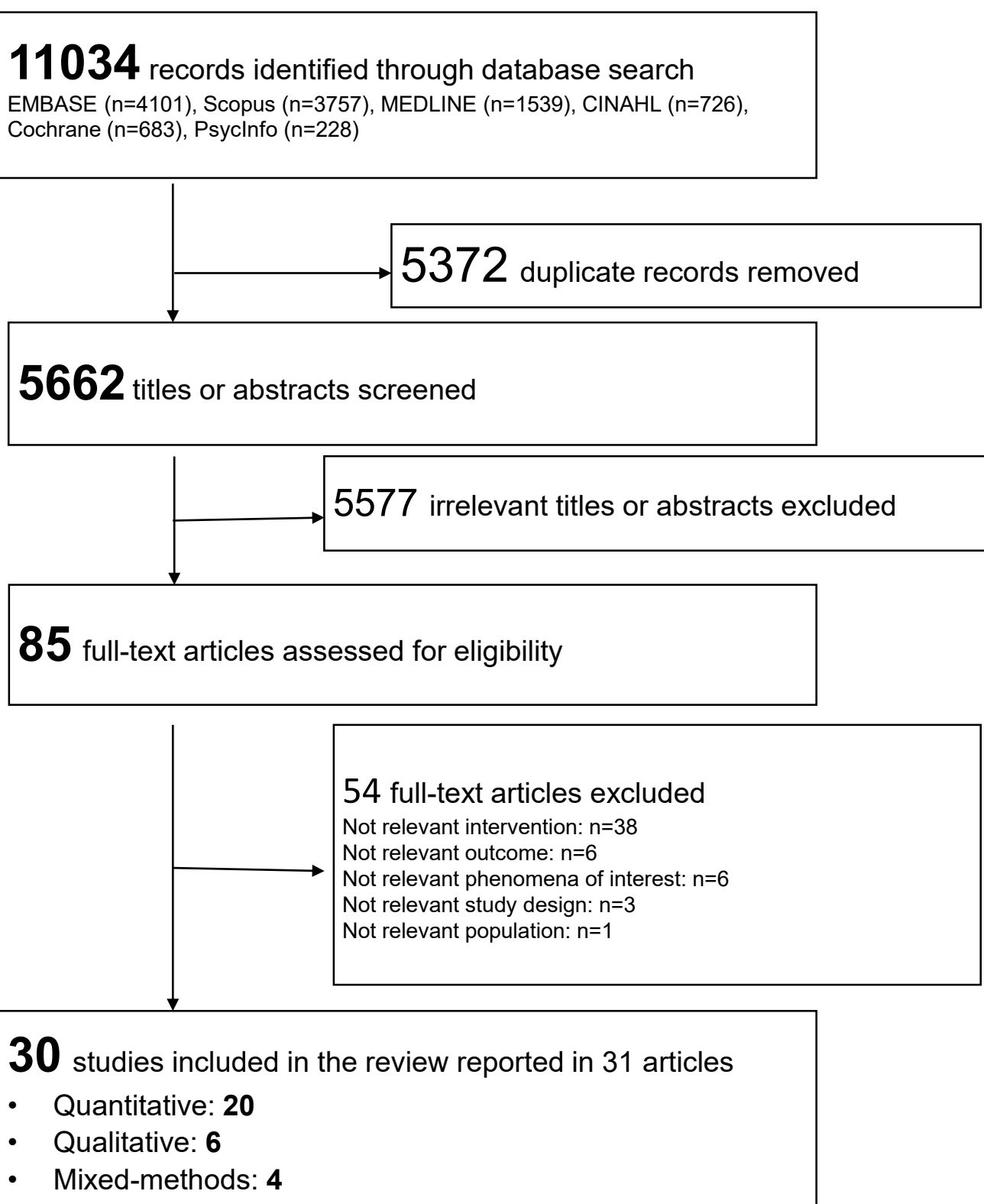
Effectiveness of asynchronous digital health (Objective 1)



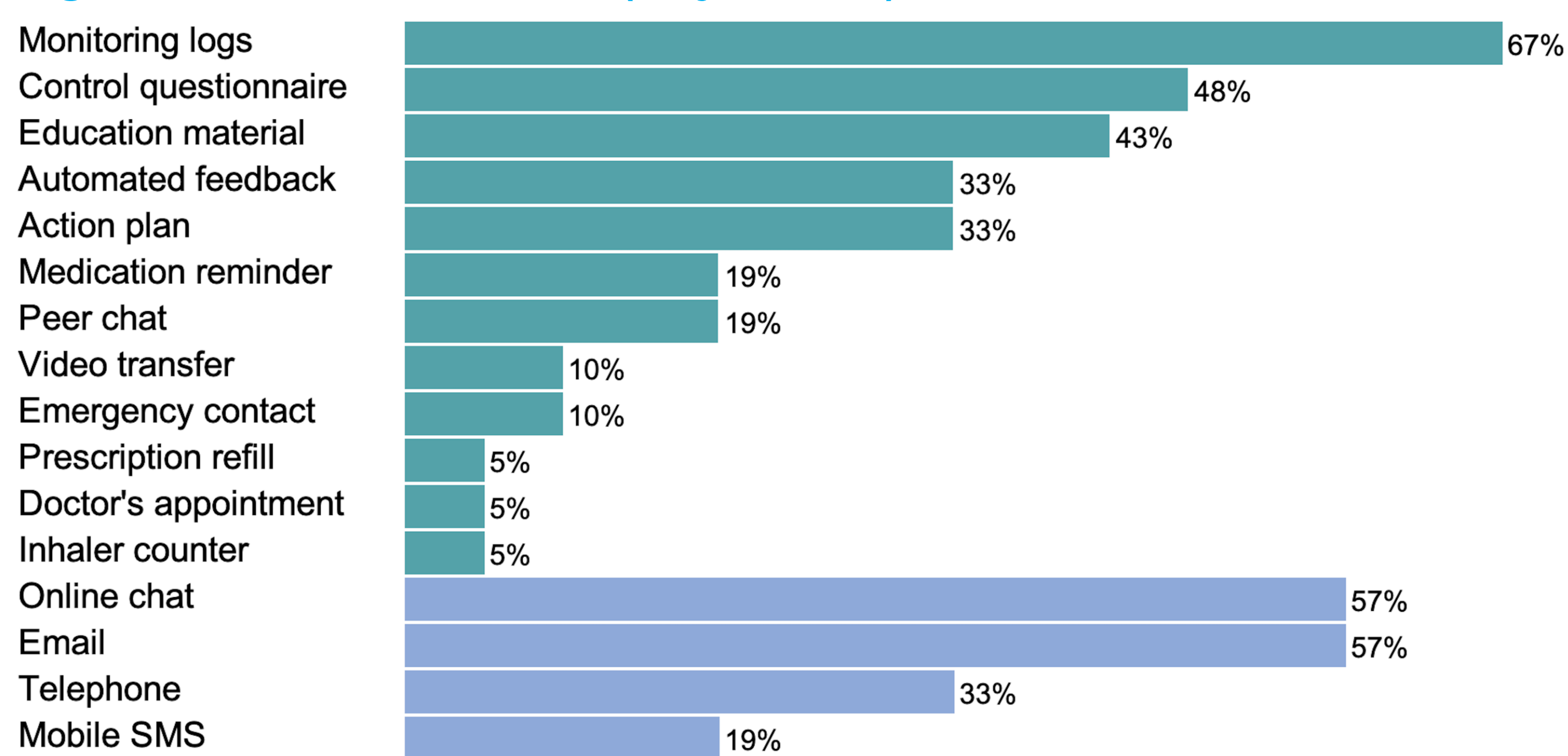
Study ID	Outcome	Weight	Risk of bias					Overall
			D1	D2	D3	D4	D5	
Cingi 2015	Asthma control	7.8	+	+	-	!	!	-
Fiks 2015	Asthma control	5.3	+	+	+	!	!	!
Gustafson 2012	Asthma control	25.9	+	+	+	!	!	!
van den Wijngaert 2017	Asthma control	8.9	+	+	+	!	!	!
van den Wijngaert 2017	Asthma control	12.3	+	+	+	!	!	!
Voorend-van Bergen 2015	Asthma control	17.9	+	+	+	!	!	!
Ahmed 2016	Quality of life	16.4	+	+	+	!	!	!
Chan 2007	Quality of life	17.1	!	+	+	!	!	!
Voorend-van Bergen 2015	Quality of life	29.6	+	+	+	!	!	!
Chan 2007	Emergency department visit	11.2	!	+	+	!	!	!
Cingi 2015	Emergency department visit	16.4	+	+	-	!	!	-
Fiks 2015	Emergency department visit	53.8	+	+	+	!	!	!
Rasmussen 2005	Emergency department visit	6.3	+	+	!	!	!	!
van den Wijngaert 2017	Emergency department visit	12.2	+	+	+	!	!	!
Chan 2007	Hospitalisation	7.4	!	+	+	!	!	!
Fiks 2015	Hospitalisation	19.8	+	+	+	!	!	!
Ostojic 2005	Hospitalisation	56.6	!	+	+	!	!	-
van den Wijngaert 2017	Hospitalisation	16.2	+	+	+	!	!	!

D1=Randomisation process, D2=Deviations from the intended interventions, D3= Missing outcome data, D4= Measurement of the outcome, D5= Selection of the reported result

Low risk: +, Some concerns: !, High risk: -



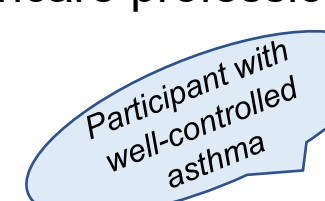
Digital functionalities used (Objective 2)



Views and experiences (Objective 3)

Theme 1: Perceptions of routine reviews

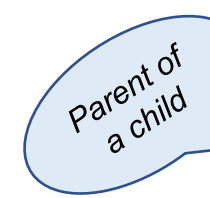
Most patients with well-controlled asthma perceived in-person routine reviews as unnecessary and preferred seeking medical help only when their symptoms worsened. Healthcare professionals echoed convenience yet noted the clinical limitations of remote reviews



"I don't need to see a doctor or nurse personally. If I know she (doctor or nurse) sees my values, then it's okay for me. Maybe when things go worse, I'd like to be examined, but if things go just normally, I don't mind to be in contact just by e-mail."

Theme 2: Pros and cons of using asynchronous digital health

Most patients/carers described asynchronous digital health as a convenient method for reviewing asthma while managing work and family responsibilities. Healthcare professionals expressed concerns that lack of physical examination and reduced face-to-face contact associated with this approach could negatively affect clinical decision-making



"Because it's easier for me to text. If I'm at work or if I'm out and I'm in a situation where I can't take a phone call, then I can always text. My text is really the best because I know it's always available to me."

Theme 3: Implementation barriers and facilitators

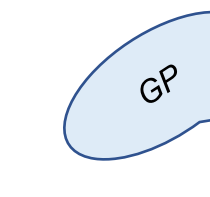
Poorly co-ordinated workflows, lack of integration with electronic health records, high workload and absence of financial reimbursement were identified as major barriers by most healthcare professionals. Accessible two-way communication, prompt responsiveness from practices and families, positive attitude and commitment were the facilitators identified by most professionals and patients/carers.



"...That I'll have not a good ability to manage the in-basket, and that our support team, while excellent, is already stretched, and not...we haven't built a great infrastructure in terms of care coordinators being able to handle first line, so until we feel secure that's in place and really well running, it feels like we are putting the cart before the horse."

Theme 4: Preferred digital functionalities

Flexibility to ask quick questions, log and visualise the trend of peak flows, symptom scores, medication usage and reminders were the most common features wanted by patients and healthcare professionals.



"It would be very useful if the patient is logging their asthma symptoms and peak flow, medication use...because that's then helping us to adjust on treatment. I would love to know if they were taking it (prescribed medication) every day like they're telling me they are."

Integrative synthesis (Objective 4)

Overall, the ease of asking quick questions, medication reminders, tailored asthma information, and organised workflow were deemed to be important factors that might positively affect the intervention outcomes.

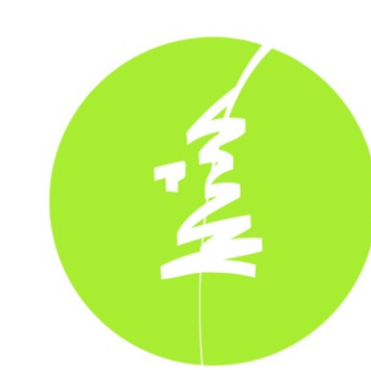
Confidence in evidence

GRADE: Very low for asthma control; and low for quality of life, emergency department visit and hospitalisation. GRADE-CERQual: Qualitative studies ranged from low to high quality

Conclusion

Asynchronous digital health is an effective adjunct to other modes of consultations or an option for routine asthma care, showing good acceptability among individuals with asthma and their caregivers.

Funding: Nazim Uzzaman is supported by a University of Edinburgh College of Medicine PhD Studentship (Grant number 34678) funded by the University of Edinburgh College of Medicine and Veterinary Medicine (CMVM) within the Asthma UK Centre for Applied Research (AUKCAR). The PhD studentship is nested in the IMP2ART (IMplementing IMProved Asthma self-management as RouTine) programme at the University of Edinburgh (<https://www.ed.ac.uk/usher/imp2art>).



Asthma UK Centre for Applied Research

