Centre for Digital Health Interventions

University of Zurich[UZH] | University of St.Gallen | ETH zürich

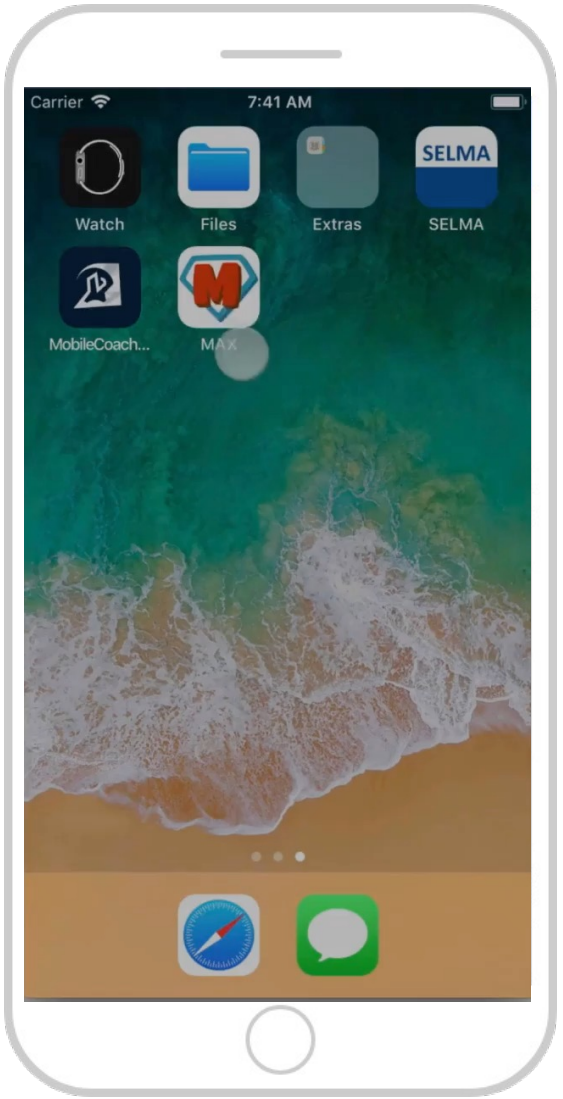
Digitale Therapeutika für die psychische Gesundheit

Prof. Dr. Tobias Kowatsch | Klinik Zugersee | 23. Mai 2024

Sources: Squid Game https://about.netflix.com/en/news/kill-or-be-killed-main-trailer-and-ensemble-poster-released-showing-the | Game of Thrones: https://www.imdb.com/title/tt0944947/mediaviewer/rm4204167425/ | Breaking Bad: https://www.flickart.com/breaking-bad-poster-series-posters-room-office-paper-print/p/itm44706fffd0682

What is a digital therapeutic?

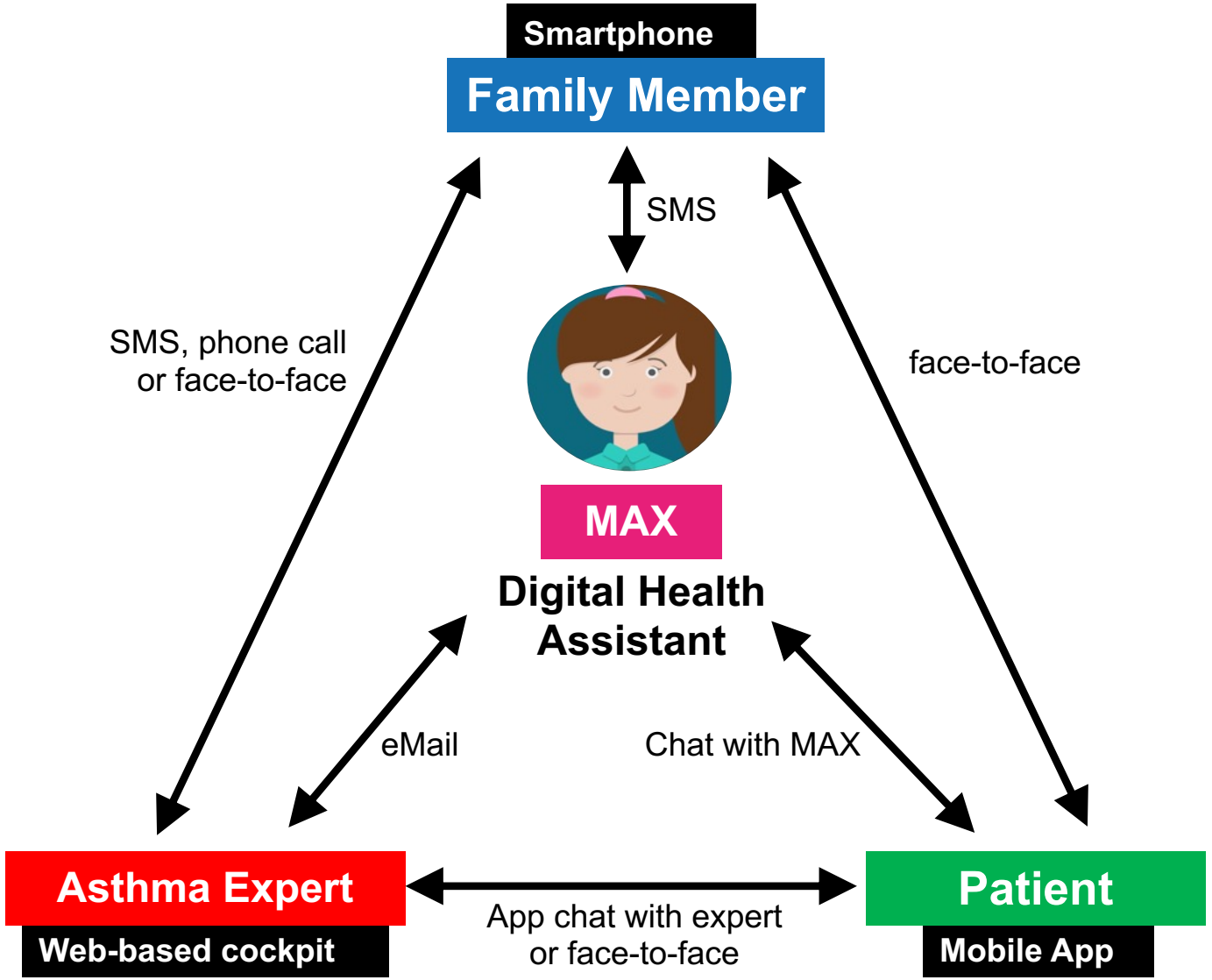
Health Literacy for Children with Asthma



www.c4dhi.org/projects/health-literacy-children-asthma/

Centre for Digital Health Interventions

Interaction with MAX

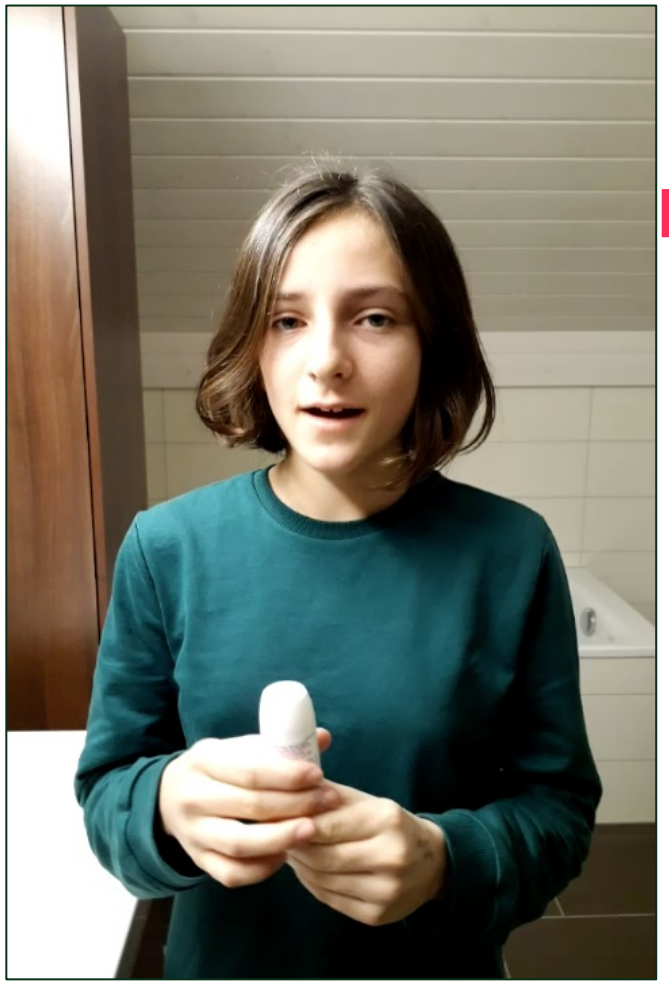


Kowatsch, T., Schachner, T., Harperink, S., Barata, F., Dittler, U., Xiao, G., Stanger, C., Oswald, H., Fleisch, E., von Wangenheim, F., Möller, A. (2021) **Conversational Agents as Mediating Social Actors in Chronic Disease Management Involving Health Care Professionals, Patients, and Family Members: Multisite Single-Arm Feasibility Study**, Journal of Medical Internet Research (JMIR) 23(2):e25060 10.2196/25060

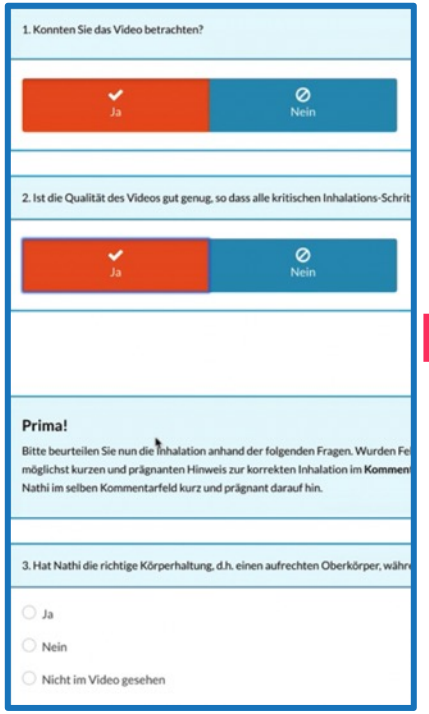
Inhalation Assessment of Norah, 12

Informed consent was received from patient and parent to use video, name and age for presentation purposes

1. Video recording by family member



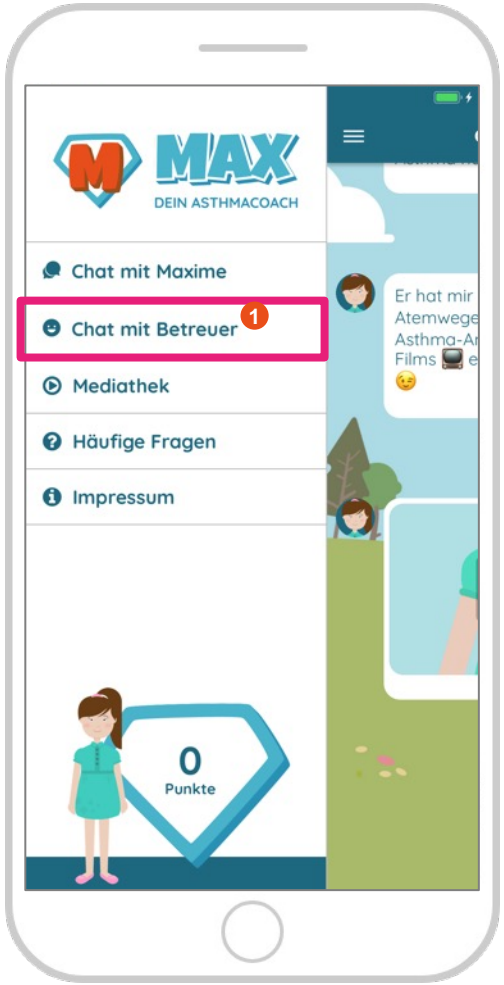
2. Expert rating



\+

Automated feedback generation based on inhalation guidelines

3. Feedback to Norah



Kowatsch, T., Schachner, T., Harperink, S., Barata, F., Dittler, U., Xiao, G., Stanger, C., Oswald, H., Fleisch, E., von Wangenheim, F., Möller, A. (2021) **Conversational Agents as Mediating Social Actors in Chronic Disease Management Involving Health Care Professionals, Patients, and Family Members: Multisite Single-Arm Feasibility Study**, Journal of Medical Internet Research (JMIR) 23(2):e25060 10.2196/25060

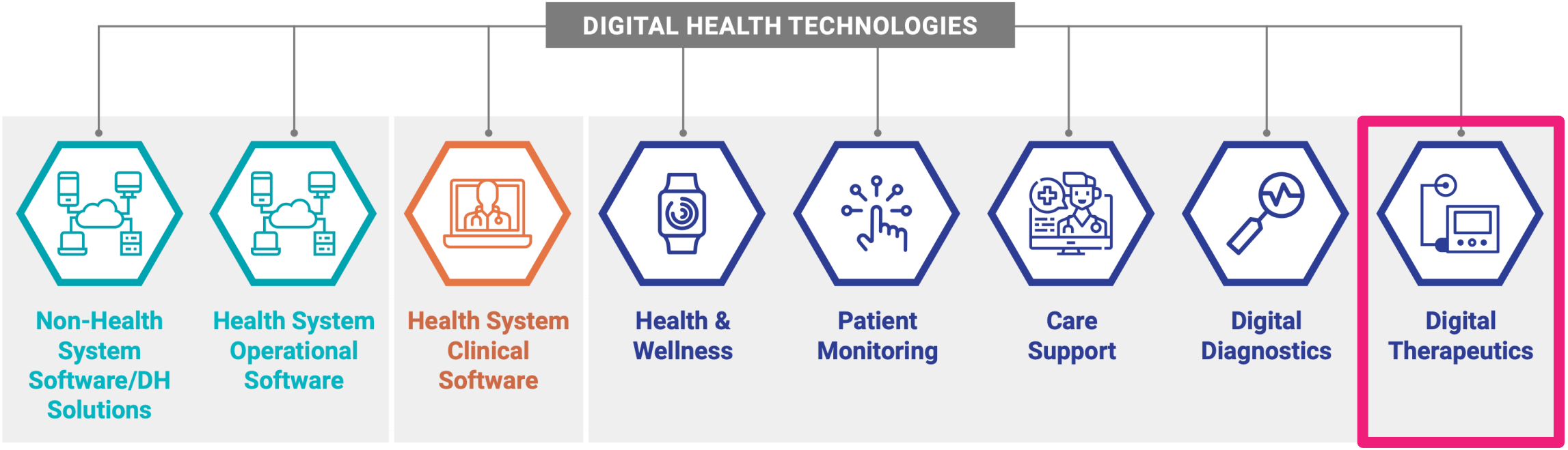
Main results of a first feasibility study

1. The average **adherence rate** of **49 subjects** was **80.4%**.
2. The result of a **pre-post test** shows that **asthma knowledge** was **improved significantly** with a **large effect size** (d=0.9).
3. On average, **1 inhalation mistake** was identified in each **video clip**; **3 serious inhalation mistakes** could be directly **addressed and eliminated** by the experts' feedback.

Kowatsch, T., Schachner, T., Harperink, S., Barata, F., Dittler, U., Xiao, G., Stanger, C., Oswald, H., Fleisch, E., von Wangenheim, F., Möller, A. (2021) **Conversational Agents as Mediating Social Actors in Chronic Disease Management Involving Health Care Professionals, Patients, and Family Members: Multisite Single-Arm Feasibility Study**, Journal of Medical Internet Research (JMIR) 23(2):e25060 10.2196/25060

Digital Therapeutics (DTx)

DTx are software-based interventions for managing or treating disease.



https://dtxalliance.org/understanding-dtx/what-is-a-dtx/ & https://dtxalliance.org/wp-content/uploads/2023/06/DTA_FS_DHT-Ecosystem-Categorization.pdf

Prescription Digital Therapeutics

Bundesinstitut für Arzneimittel und Medizinprodukte

started in October 2020

1. In May 2024, 35 DIGAs are permanently listed.
2. "Standalone" digital therapeutics, i.e. no blended treatments

Example

HelloBetter Diabetes und Depression

nommen |
Online
gs GmbH, Deutschland

Anzuwenden bei

E10 Diabetes mellitus, Typ 1

E11 Diabetes mellitus, Typ 2

Plattformen

Webanwendung

Eigenschaften

Herstellerpreis: 222,99 €
Keine Mehrkosten

diga.bfarm.de/de

DIGAs in Germany: 17 of 35 (ca. 50%) are Targeting Mental Health

deprexis

Dauerhaft aufgenommen | GAIA AG, Deutschland

Plattformen
- Webanwendung

Anzuwenden bei
- F32.0 Leichte depressive Episode
- F32.1 Mittelgradige depressive Episode
- F32.2 Schwere depressive Episode ohne psychotische Symptome

und 3 weitere

Eigenschaften
- Herstellerpreis: 210,00 € Keine Mehrkosten
- Keine Zusatzgeräte
- Keine vertragsärztlichen Leistungen erforderlich
- Verfügbare Sprachen: Deutsch und 8 weitere

Weitere Informationen zur DiGA

edupression.com®

Dauerhaft aufgenommen | SOFY GmbH, Österreich

Plattformen
- Webanwendung

Anzuwenden bei
- F32.0 Leichte depressive Episode
- F32.1 Mittelgradige depressive Episode
- F33.0 Rezidivierende depressive Störung, gegenwärtig leichte Episode
- F33.1 Rezidivierende depressive Störung, gegenwärtig mittelgradige Episode

Eigenschaften
- Herstellerpreis: 224,80 € Keine Mehrkosten
- Keine Zusatzgeräte
- Keine vertragsärztlichen Leistungen erforderlich
- Verfügbare Sprachen: Deutsch und 1 weitere

Weitere Informationen zur DiGA

HelloBetter Panik

Dauerhaft aufgenommen | GET.ON Institut für Online Gesundheitstrainings GmbH, Deutschland

Plattformen
- Webanwendung

Anzuwenden bei
- F40.01 Agoraphobie: Mit Panikstörung
- F41.0 Panikstörung [episodisch paroxysmale Angst]

Eigenschaften
- Herstellerpreis: 230,00 € Keine Mehrkosten
- Keine Zusatzgeräte
- Keine vertragsärztlichen Leistungen erforderlich
- Verfügbare Sprachen: Deutsch

Weitere Informationen zur DiGA

Invirto- Die Therapie gegen Angst

Dauerhaft aufgenommen | Sympatient GmbH, Deutschland

Plattformen
- Apple App Store
- Google Play Store

Anzuwenden bei
- F40.00 Agoraphobie: Ohne Angabe einer Panikstörung
- F40.01 Agoraphobie: Mit Panikstörung
- F40.1 Soziale Phobien
- F41.0 Panikstörung [episodisch paroxysmale Angst]

Eigenschaften
- Herstellerpreis: 220,00 € Keine Mehrkosten
- Zusatzgeräte enthalten
- Vertragsärztliche Leistungen erforderlich
- Verfügbare Sprachen: Deutsch

Weitere Informationen zur DiGA

diga.bfarm.de/de

DIGAs in Germany: 17 of 35 (ca. 50%) are Targeting Mental Health

Mindable: Panikstörung und Agoraphobie

Dauerhaft aufgenommen | Mindable Health GmbH, Deutschland

Plattformen
- Apple App Store
- Google Play Store

Anzuwenden bei
- F40.0 Agoraphobie
- F41.0 Panikstörung [episodisch paroxysmale Angst]

Eigenschaften
- Herstellerpreis: 245,50 € Keine Mehrkosten
- Keine Zusatzgeräte
- Keine vertragsärztlichen Leistungen erforderlich
- Verfügbare Sprachen: Deutsch und 2 weitere

Weitere Informationen zur DiGA

Novego: Depressionen bewältigen

Dauerhaft aufgenommen | IVPNetworks GmbH, Deutschland

Plattformen
- Webanwendung

Anzuwenden bei
- F32.0 Leichte depressive Episode
- F32.1 Mittelgradige depressive Episode
- F32.2 Schwere depressive Episode ohne psychotische Symptome

und 4 weitere

Eigenschaften
- Herstellerpreis: 199,00 € Keine Mehrkosten
- Keine Zusatzgeräte
- Keine vertragsärztlichen Leistungen erforderlich
- Verfügbare Sprachen: Deutsch

Weitere Informationen zur DiGA

Selfapys Online-Kurs bei Depression

Dauerhaft aufgenommen | Selfapy GmbH, Deutschland

Plattformen
- Apple App Store
- Google Play Store
- Webanwendung

Anzuwenden bei
- F32.0 Leichte depressive Episode
- F32.1 Mittelgradige depressive Episode
- F33.0 Rezidivierende depressive Störung, gegenwärtig leichte Episode
- F33.1 Rezidivierende depressive Störung, gegenwärtig mittelgradige Episode

Eigenschaften
- Herstellerpreis: 217,18 € Keine Mehrkosten
- Keine Zusatzgeräte
- Keine vertragsärztlichen Leistungen erforderlich
- Verfügbare Sprachen: Deutsch

Weitere Informationen zur DiGA

Selfapys Online-Kurs bei Generalisierter Angststörung

Dauerhaft aufgenommen | Selfapy GmbH, Deutschland

Plattformen
- Apple App Store
- Google Play Store
- Webanwendung

Anzuwenden bei
- F41.1 Generalisierte Angststörung

Eigenschaften
- Herstellerpreis: 228,50 € Keine Mehrkosten
- Keine Zusatzgeräte
- Keine vertragsärztlichen Leistungen erforderlich
- Verfügbare Sprachen: Deutsch

Weitere Informationen zur DiGA

diga.bfarm.de/de

DIGAs in Germany: 17 of 35 (ca. 50%) are Targeting Mental Health

somnio

Dauerhaft aufgenommen | mementor DE GmbH, Deutschland

Plattformen
- Apple App Store
- Google Play Store
- Webanwendung

Anzuwenden bei
- F51.0 Nichtorganische Insomnie
- G47.0 Ein- und Durchschlafstörungen

Eigenschaften
- Herstellerpreis: 224,99 € Keine Mehrkosten
- Zusatzgeräte optional
- Vertragsärztliche Leistungen erforderlich
- Verfügbare Sprachen: Deutsch und 2 weitere

Weitere Informationen zur DiGA

velibra

Dauerhaft aufgenommen | GAIA AG, Deutschland

Plattformen
- Webanwendung

Anzuwenden bei
- F40.01 Agoraphobie: Mit Panikstörung
- F40.1 Soziale Phobien
- F41.0 Panikstörung [episodisch paroxysmale Angst]
- F41.1 Generalisierte Angststörung

Eigenschaften
- Herstellerpreis: 230,00 € Keine Mehrkosten
- Keine Zusatzgeräte
- Keine vertragsärztlichen Leistungen erforderlich
- Verfügbare Sprachen: Deutsch und 1 weitere

Weitere Informationen zur DiGA

vorvida

Dauerhaft aufgenommen | GAIA AG, Deutschland

Plattformen
- Webanwendung

Anzuwenden bei
- F10.1 Psychische und Verhaltensstörungen durch Alkohol: Schädlicher Gebrauch
- F10.2 Psychische und Verhaltensstörungen durch Alkohol: Abhängigkeitssyndrom

Eigenschaften
- Herstellerpreis: 192,01 € Keine Mehrkosten
- Keine Zusatzgeräte
- Keine vertragsärztlichen Leistungen erforderlich
- Verfügbare Sprachen: Deutsch und 1 weitere

Weitere Informationen zur DiGA

priovi - digitale Unterstützung der Borderline-Behandlung

Dauerhaft aufgenommen | GAIA AG, Deutschland

Plattformen
- Webanwendung

Anzuwenden bei
- F60.31 Emotional instabile Persönlichkeitsstörung: Borderline-Typ

Eigenschaften
- Herstellerpreis: 855,82 € Keine Mehrkosten
- Keine Zusatzgeräte
- Keine vertragsärztlichen Leistungen erforderlich
- Verfügbare Sprachen: Deutsch

Weitere Informationen zur DiGA

diga.bfarm.de/de

Why do we need digital therapeutics?

What is the **fundamental** problem?

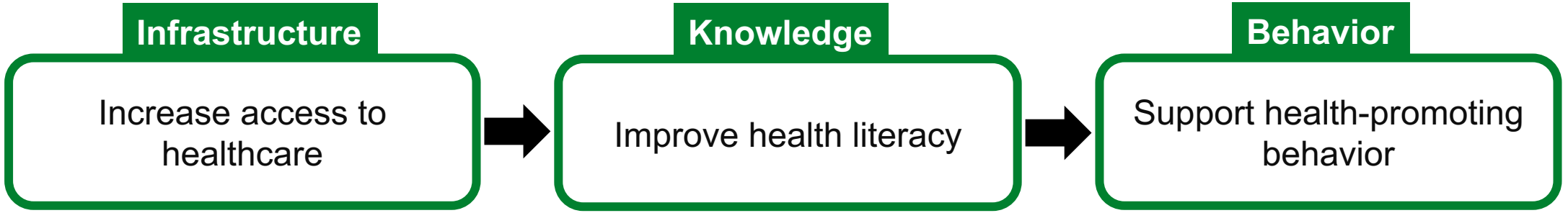
The **health** and **economic** **burden** of **noncommunicable diseases** (NCDs).

What is the **specific problem** in terms of **socioeconomic inequalities**?

Individuals with a **lower socioeconomic status** are **more** affected by **NDCs.**

Mackenback et al (2008, data based on 22 European Countries)

Why is that so and what can we do?



Carrilero et al 2021, Wang & Geng 2019, Mackenbach et al 2008, Sharrocks et al 2014, Ford et al 2008, Davis et al 2020, Kevdar et al 2016

What about Squid Game, Game of Thrones, and Breaking Bad?

59 Emmy Awards

16 Emmy Awards

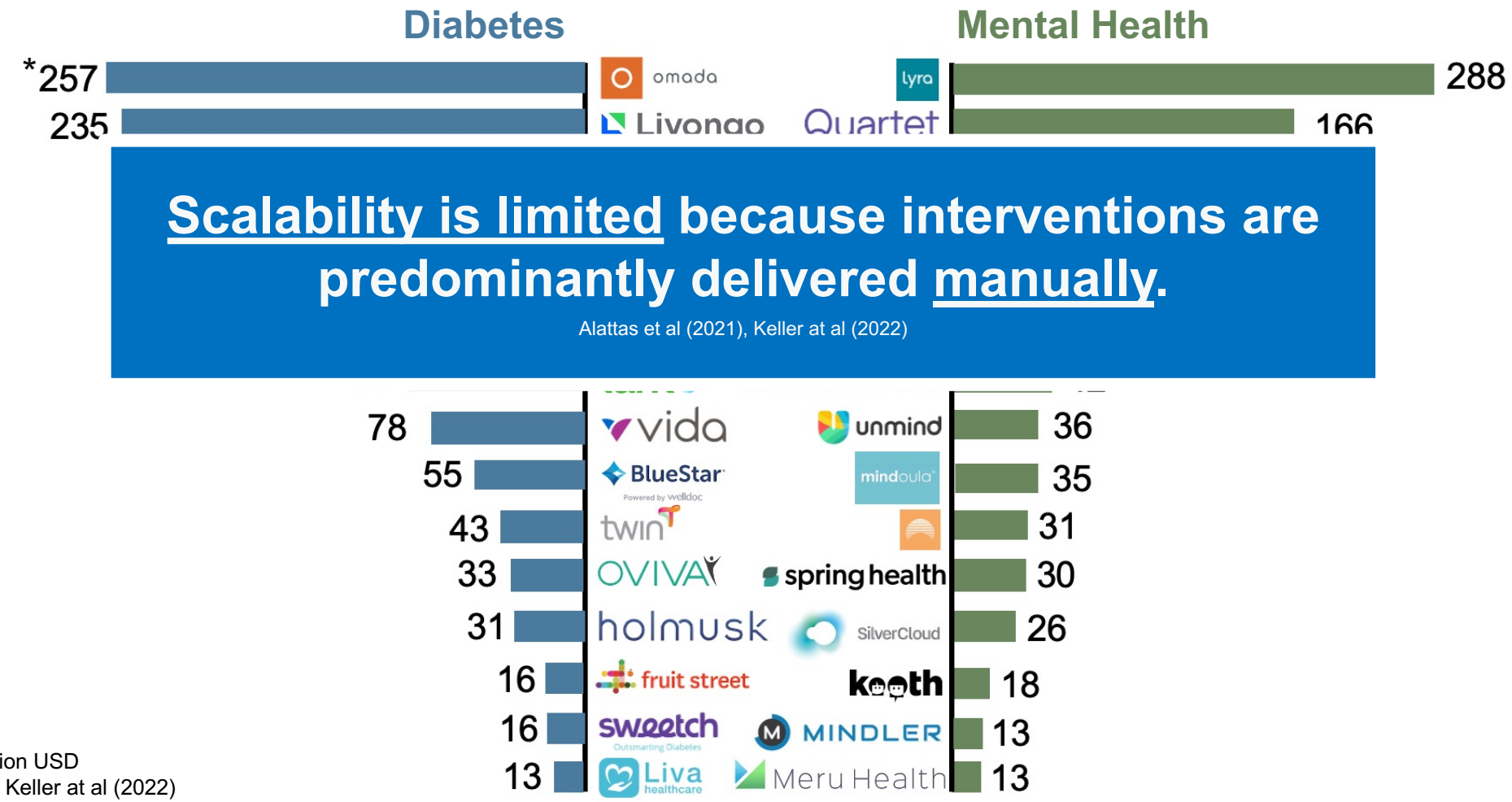
1. They were the most-successful TV shows reaching millions of individuals in their comfort zones. Parrot Analytics (2021)
2. They are episodic and usually tell stories over the course of several months or even years.
3. They reach rather individuals with a lower socioeconomic status. Hovden & Rosenlund (2021)

Sources IMDB Squid Game: imdb.com/title/tt10919420/?ref_=fn_al_tt_1 | Game of Thrones: imdb.com/title/tt0944947/?ref_=fn_al_tt_1 Breaking Bad: imdb.com/title/tt0903747/?ref_=fn_al_tt_1
Rotten Tomatoes Squid Game: rottentomatoes.com/tv/squid_game | Game of Thrones: rottentomatoes.com/tv/game-of-thrones | Breaking Bad: https://www.rottentomatoes.com/tv/breaking_bad accessed October 19, 2021
Netflix views of Squid Game (111 million out of 209 million subscribers): adweek.com/convergent-tv/netflix-says-squid-game-is-its-most-watched-show-ever/
Parrot Analytics (2021), data of the three TV shows accessed on October 21, 2021 via https://www.parrotanalytics.com (subscription)

What can we learn from the **most successful TV shows** to **lower the socioeconomic inequalities in health**?

1. TV shows are scalable.

How scalable are interventions offered by top-funded digital health companies?



Scalability is limited because interventions are predominantly delivered manually.

Alattas et al (2021), Keller at al (2022)

Total funding in million USD
Alattas et al (2021), Keller at al (2022)

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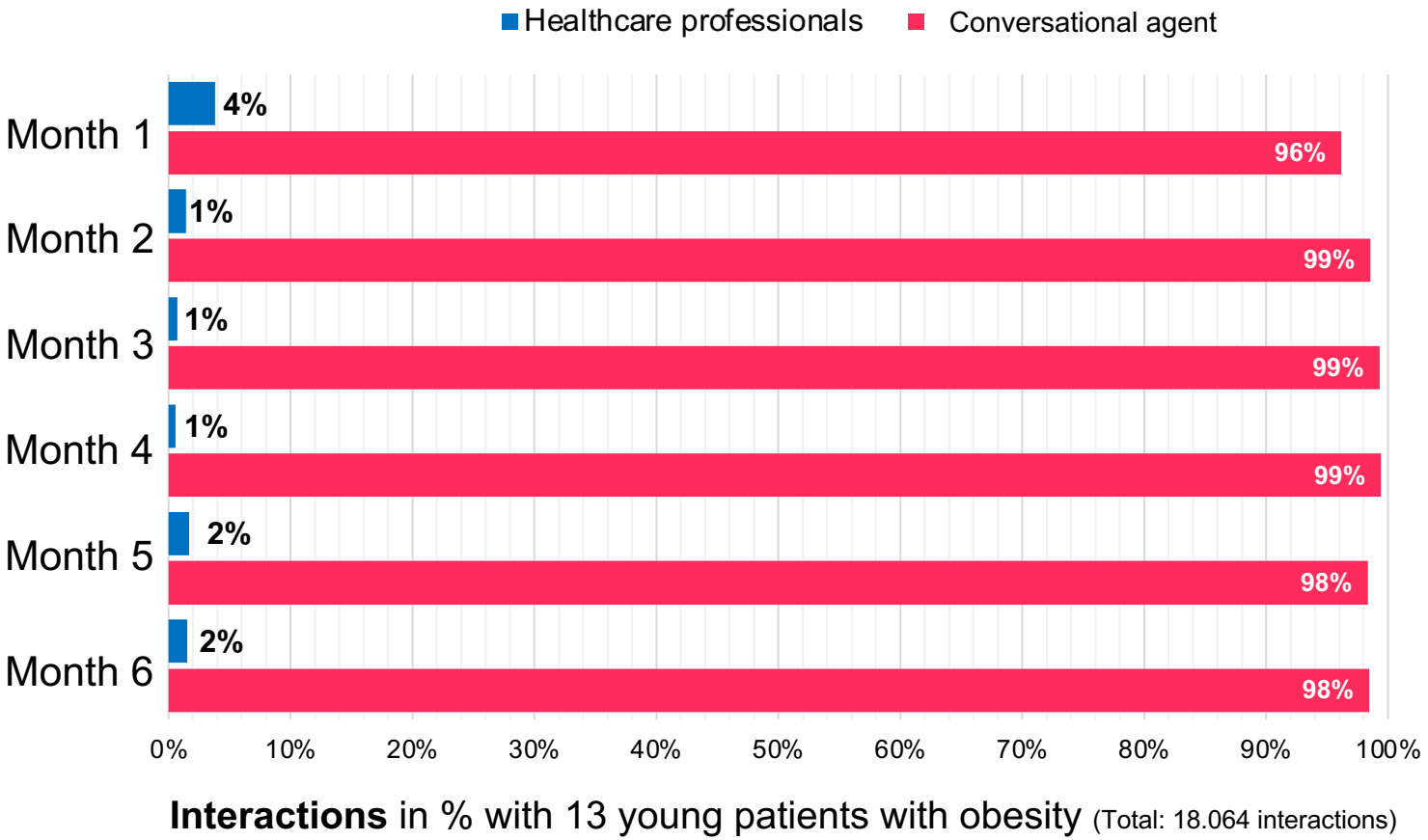
Is there any evidence that health interventions can be scalable and effective, esp. for individuals with a lower socioeconomic status?



Interactions in % with 13 young patients with obesity (Total: 18.064 interactions)

Fat mass decreased significantly.

Stasinaki et al (2021)

UNIVERSITÉ DE GENÈVE

OSTSCHWEIZER KINDERSPITAL

Swiss National Science Foundation

What can we learn from the **most successful TV shows** to **lower the socioeconomic inequalities in health**?

2. TV shows are low-burden.

How burdensome are the most popular health apps?

Construct measured	Self-Reports: Open Questions	Self-Reports: Closed Questions	Self-Reports: Sum Self-Reports	Use of digital biomarkers: Vital Signs	Location	Camera	Microphone	Total (%)
Activity	3	23	26	2	2	1	0	5
Mood	18	39	57	0	0	1	1	2
Interest/Pleasure	1	15	16	0	0	0	0	0
Appetite	0	9	9	0	0	0	0	0
Cognition	2	6	8	0	0	0	0	0
Unhelpful Beliefs	6	17	23	0	0	0	0	0
Concentration	1	9	10	0	0	0	0	0
Suicidal Thoughts	3	7	10	0	0	0	0	0
Sleep	2	18	20	0	0	0	0	0
Illogical Thinking	0	3	3	0	0	0	0	0
Distorted perception	2	5	7	0	0	0	0	0
Total	38	151	189	2	2	2	1	7
%	19	77	96	1	1	1	1	4

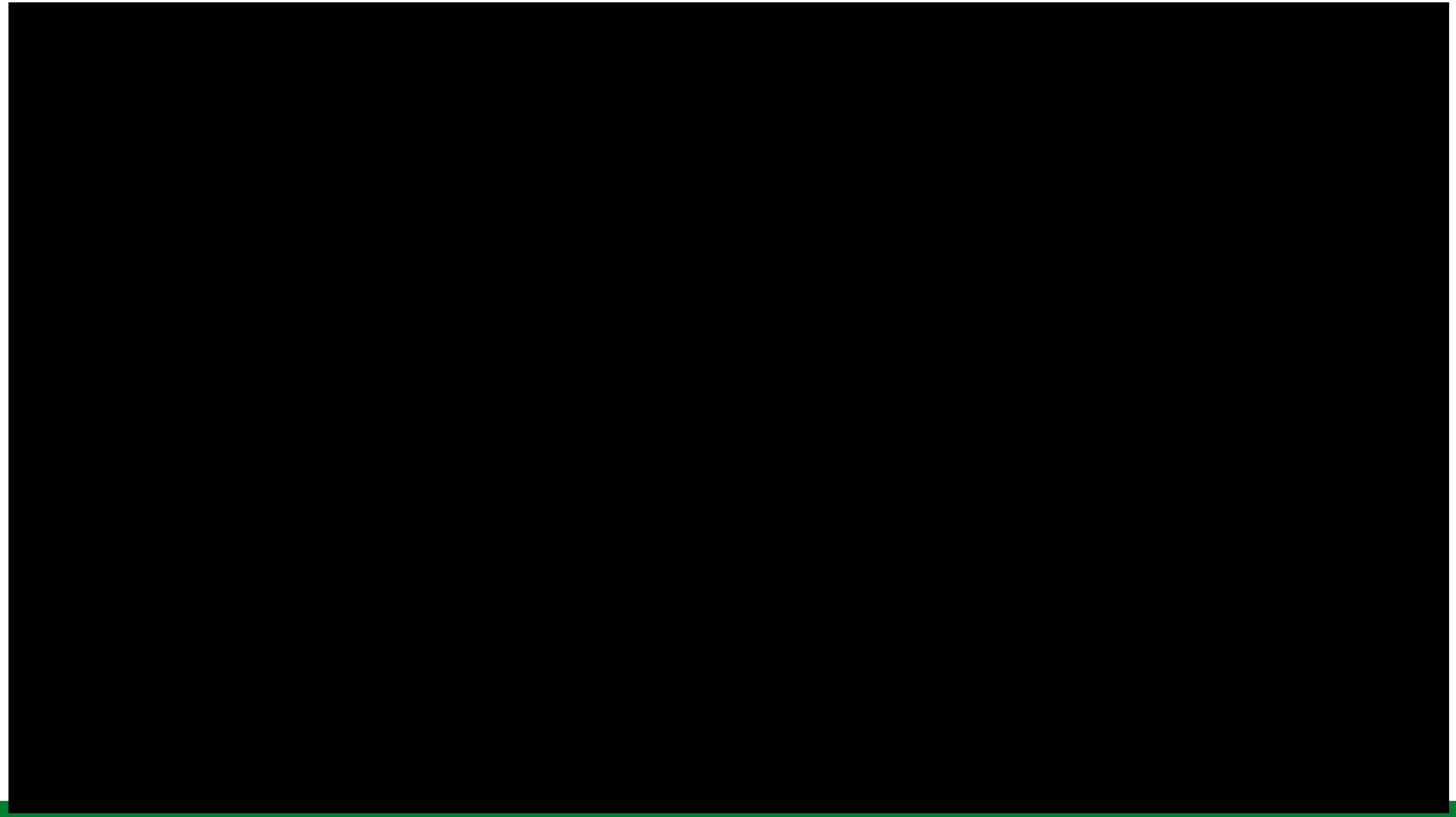
Calm headspace …

As of today, there is still a huge untapped potential of using digital biomarkers.

We can do better, esp. in terms of patient burden.

Source: headspace.com, calm.com (>10M installs), Teepe et al (2021), See also Keller et al (2022) for diabetes

An example: Low-burden health monitoring while we are sleeping



Resmonics

www.resmonics.ai

Barata et al (2020), Tinschert et al (2019/2020), and Rassouli et al (2020)

An example: I feel BEDDA – A Vocal Biomarker for Subclinical Depression

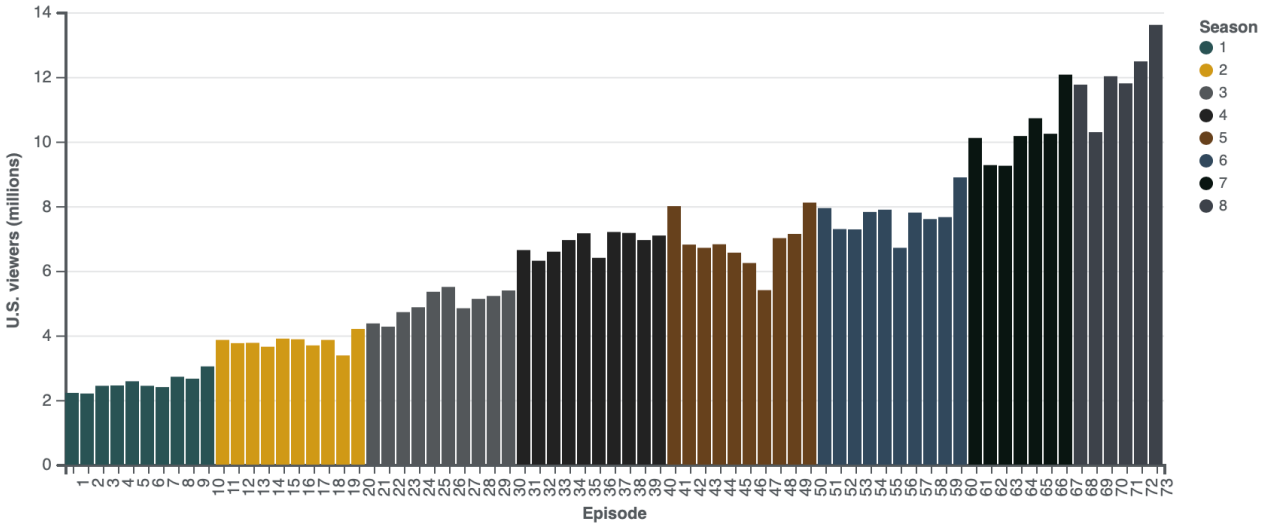
Teepe, G., Lukic, Y., Kleim, B., Jacobson, N.C., Schneider, F., Santhanam, P., Fleisch, E., Kowatsch, T. (2023) **Development of a digital biomarker and intervention for subclinical depression: study protocol for a longitudinal waitlist control study**, BMC Psychology 11, 186. 10.1186/s40359-023-01215-1.

What can we learn from the **most successful TV shows** to **lower the socioeconomic inequalities in health**?

3. TV shows are entertaining.

Engagement with TV shows vs popular mental health apps

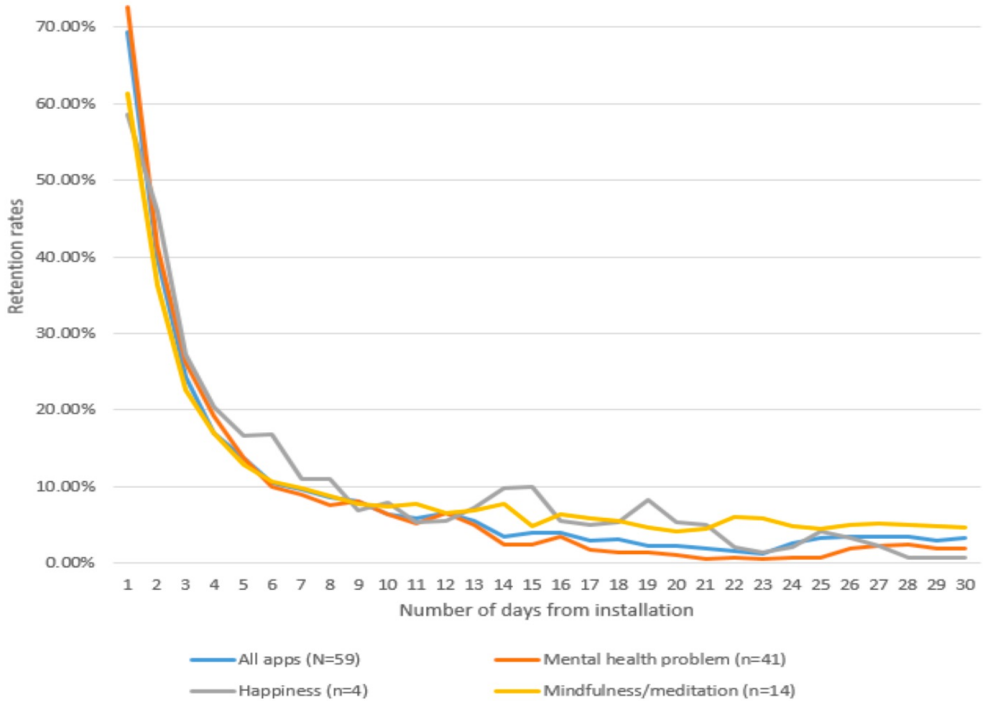
***Game of Thrones* : U.S. viewers per episode (millions)**



2011 – 2019

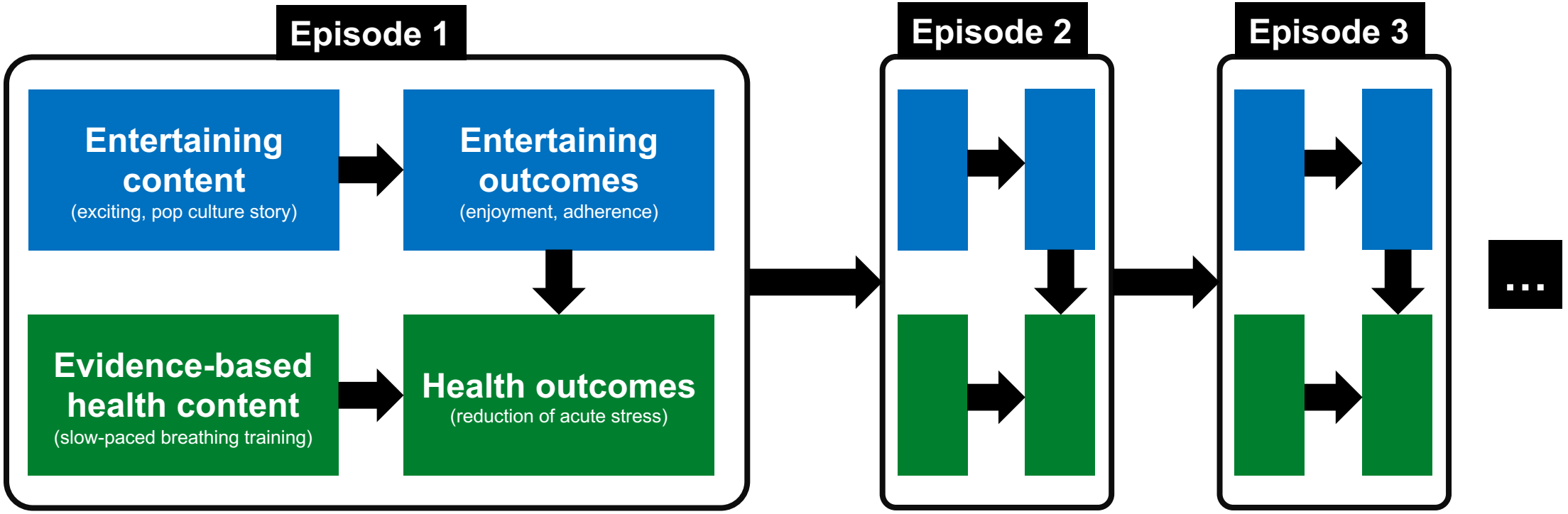
Source of U.S. viewers per Game of Thrones episode in millions: https://en.wikipedia.org/wiki/Game_of_Thrones & Nielsen Media Research

Popular Mental Health Apps
Baumel et al (2019)



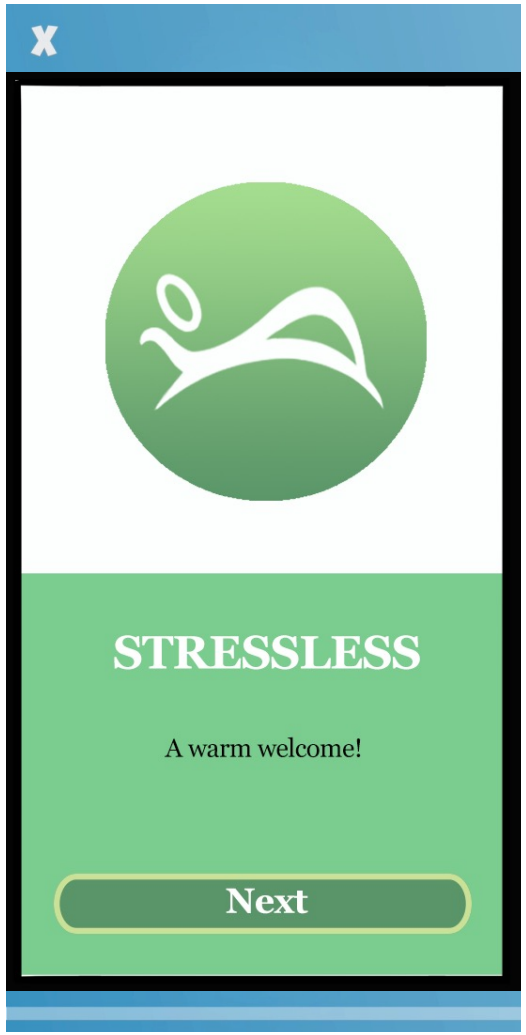
„Figure 2. App 30-day retention by mental health focus. The percentages reflect the number of users who opened the app from day 1 to day 30 out of the number of users who installed and opened the app on day 0.“ (Baumel et al 2019)

Combination of both entertaining and evidence-based medical ingredients



Inspired by Liu et al (2017)

An example: A slow-paced breathing training



Perceived enjoyment was **significantly higher** in the sailboat version.
Lukic et al (2021a) N=156

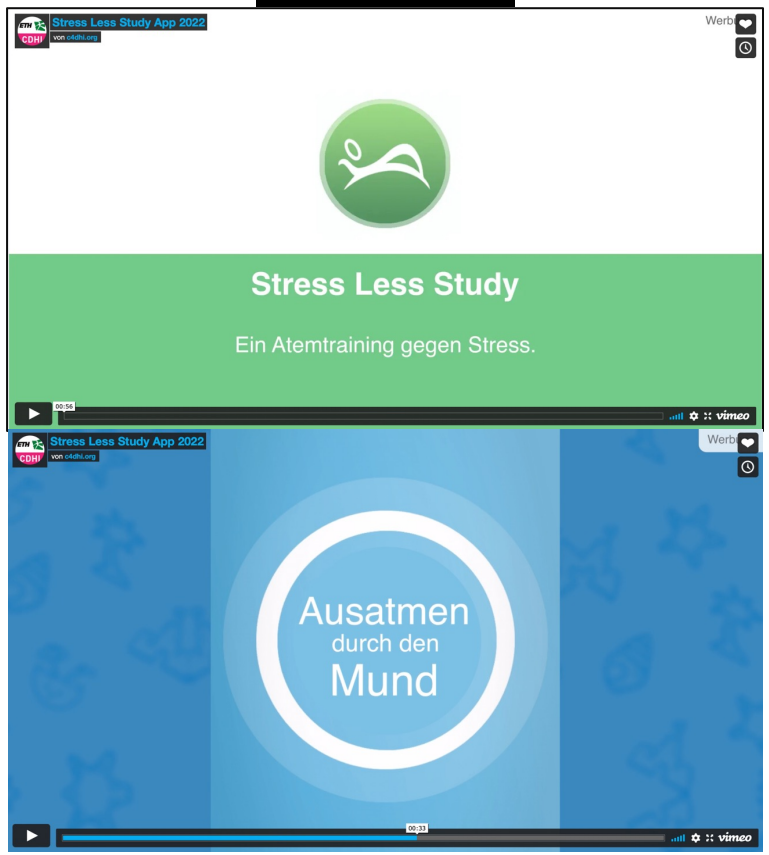
Perceived effectiveness was **high** in both versions.
Lukic et al (2021a) N=156

„Health effects are side effects.“

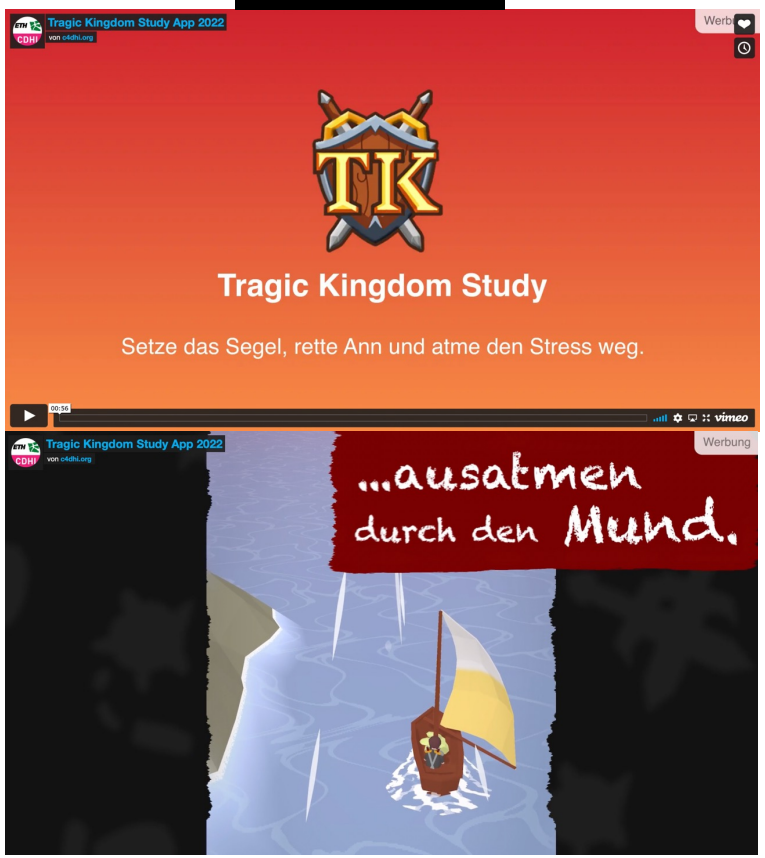
See also Shih et al (2019), Lukic et al (2021b)

An experiment with influencers on Twitch

Traditional Style



Storytelling Style



Caution: Preliminary data based on 6 influencer / 2 per condition: niikoletaa, Feedeline, Primalavera, RyanXCole, FranzHoesisch, EmaxTTV

Reach
# of app downloads divided by the average number of viewers

7.1%

34.6%

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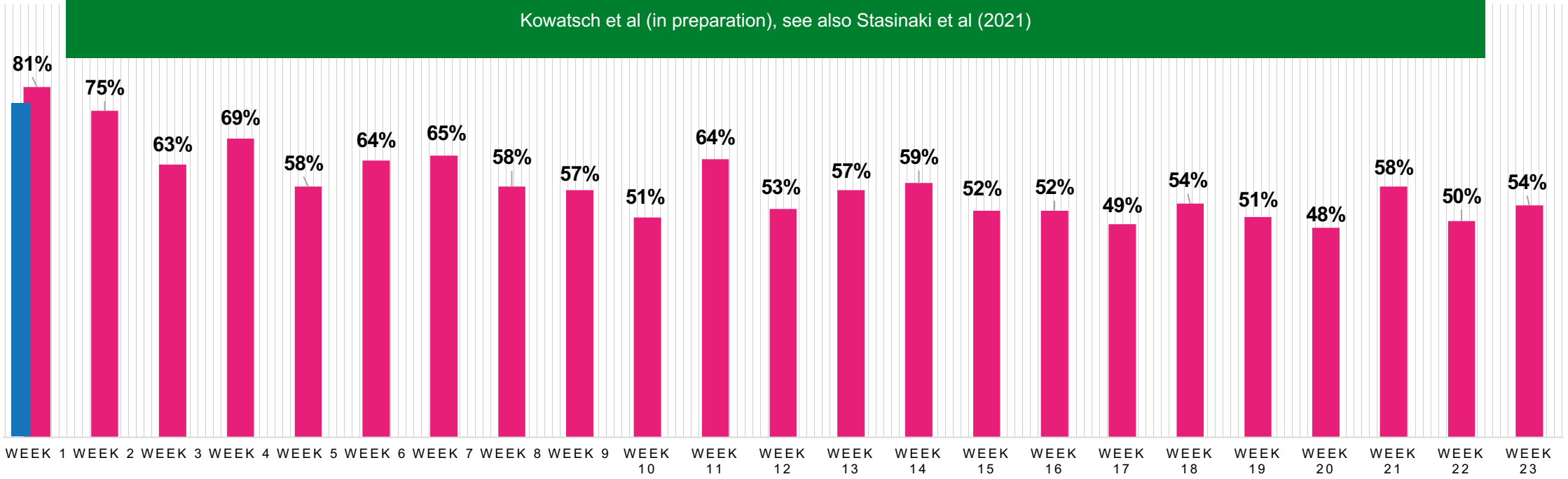
Is there evidence that health interventions can be engaging over a significant amount of time, esp. for those with a lower socioeconomic status?

Average daily goal achievement rate of 18 young patients with obesity: 58%

Kowatsch et al (in preparation), see also Stasinaki et al (2021)



Our first study with a similar population without entertaining content (no storytelling).

Swiss National Science Foundation

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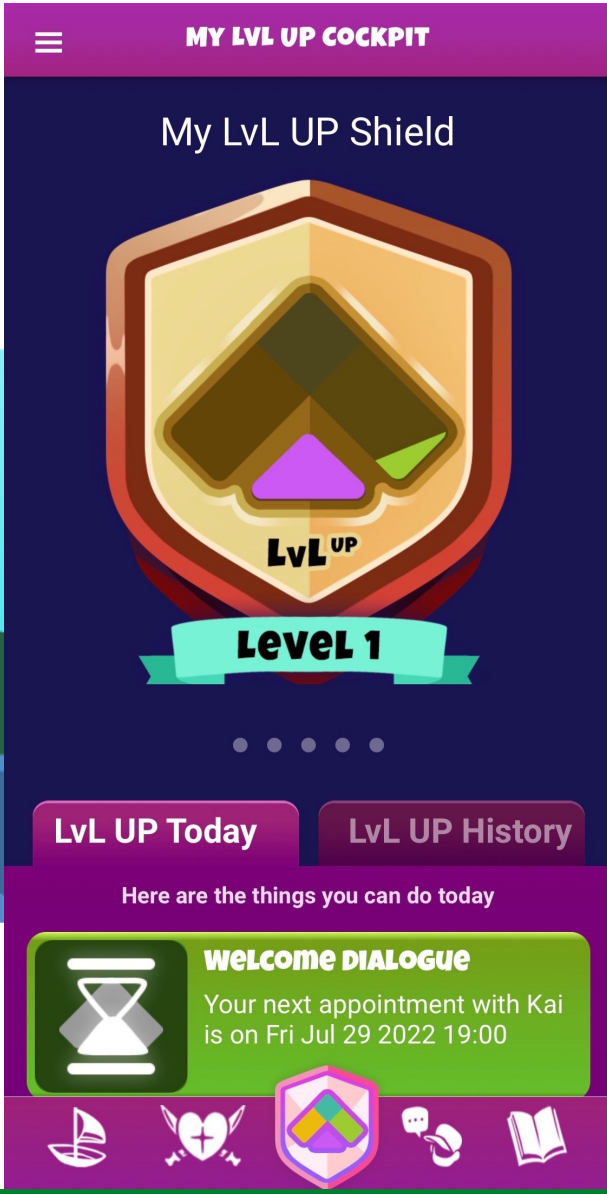

(SEC) SINGAPORE-ETH CENTRE ETH zürich NUS National University of Singapore LEE KONG CHIAN SCHOOL OF MEDICINE Nanyang Technological University Singapore Imperial College London Center for Digital Health Interventions CSS University of St.Gallen Northeastern University LIONFISH STUDIOS

https://www.c4dhi.org/projects/lvlup-a-digital-lifestyle-coach-for-the-prevention-of-ncds-in-singapore/ & http://lvlup.com.sg/

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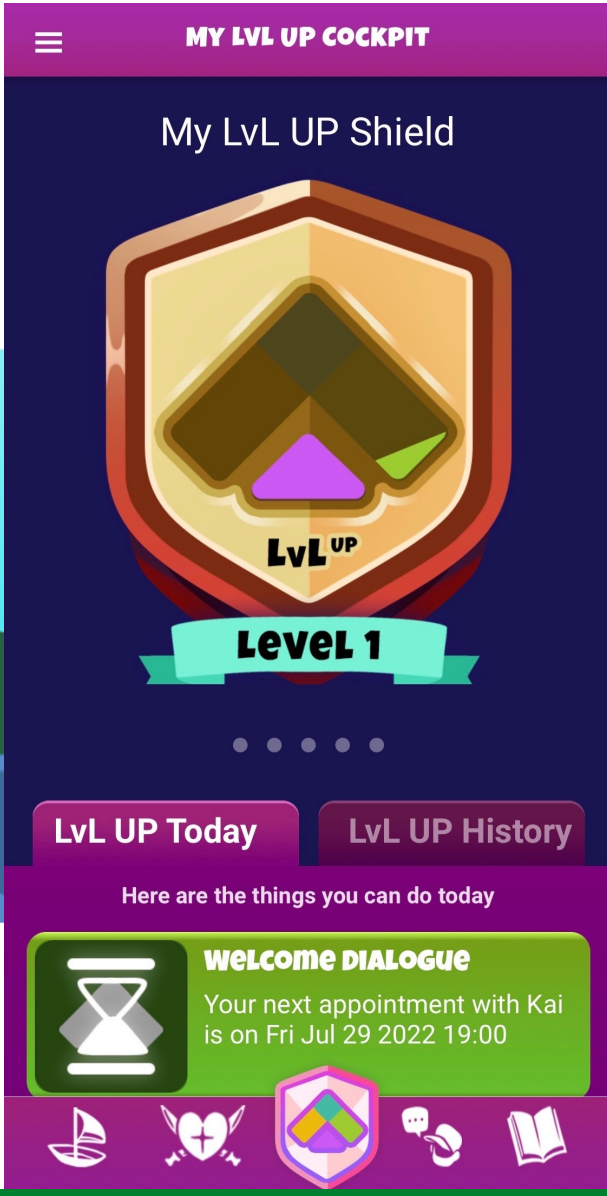
DEMO



(SEC) SINGAPORE-ETH CENTRE ETH zürich NUS National University of Singapore LEE KONG CHIAN SCHOOL OF MEDICINE Nanyang Technological University Singapore Imperial College London Center for Digital Health Interventions CSS University of St.Gallen Northeastern University LIONFISH STUDIOS

https://www.c4dhi.org/projects/lvlup-a-digital-lifestyle-coach-for-the-prevention-of-ncds-in-singapore/ & http://lvlup.com.sg/

What can we learn from the **most successful TV shows** to **lower the socioeconomic inequalities in health**?

4. TV shows offer relatable characters.

Relatable Characters in Squid Game, Game of Thrones, and Breaking Bad

Seong Gi-hun struggles **financially** and joins a high-reward but deadly game.

Jon Snow works his way up in the **social system** and becomes the leader of the wildlings.

Walter White diagnosed with **lung cancer** becomes a drug lord to secure his **family's** future.

Sources Squid Game: imdb.com/title/tt10919420/?ref_=fn_al_tt_1 | and https://www.looper.com/610545/the-ending-of-squid-game-season-1-explained/ (Netflix)
Game of Thrones: imdb.com/title/tt0944947/?ref_=fn_al_tt_1 and https://www.br.de/puls/themen/popkultur/jon-snow-kit-harington-jimmy-fallon-100.html (picture-alliance/dpa)
Breaking Bad: imdb.com/title/tt0903747/?ref_=fn_al_tt_1 and https://www.kino.de/serie/breaking-bad-2013/news/das-ende-von-breaking-bad-wurde-bereits-in-staffel-2-verraten/ (AMC)

See also McKee (2010, 2021)

Why having relatable characters in health interventions?

Working alliance between **patient** and **doctor**
is robustly linked to **treatment success.**

Di Blasi (2001) Flückiger et al. (2018) Del Re et al. (2021)

Can we also frame computers as social actors and build up a working alliance with patients?

Yes, there is a large amount of evidence on
conversational agents (chatbots) in healthcare.

Bickmore (relationalagents.com), Schachner et al 2020, Tudor Car et al (2020), Kowatsch et al (2021a/b)

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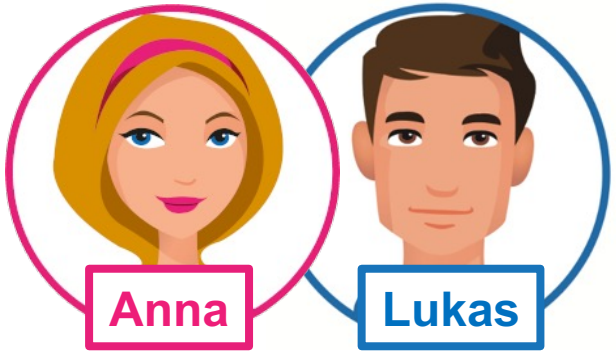
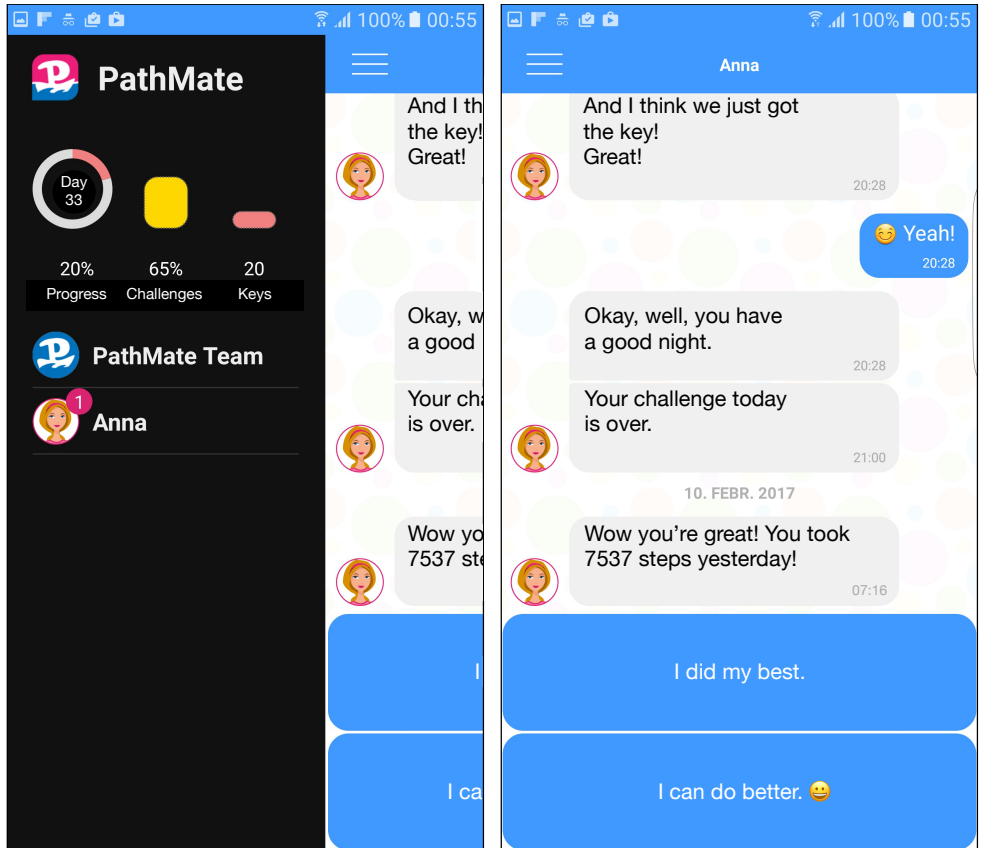
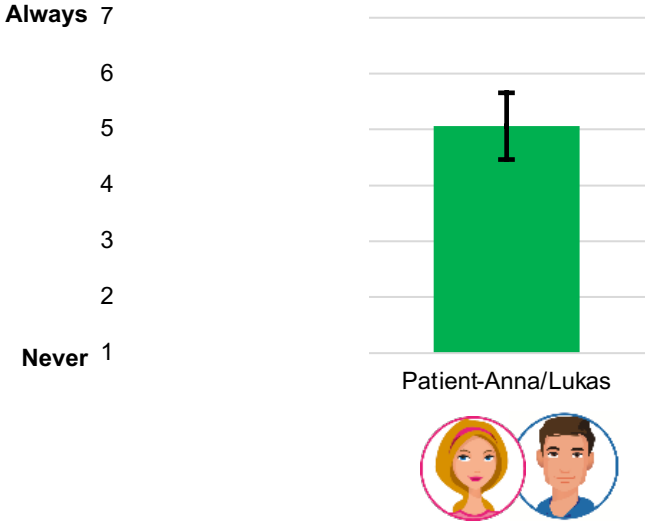
Is there any evidence that individuals with a lower socioeconomic status can build up a working alliance with conversational agents?





Working Alliance after 6-months of 18 young patients with obesity



Swiss National Science Foundation

OSTSCHWEIZER KINDERSPITAL

UNIVERSITÉ DE GENÈVE

Stasinaki et al (2021), Kowatsch et al (2017), Kowatsch et al (in preparation)

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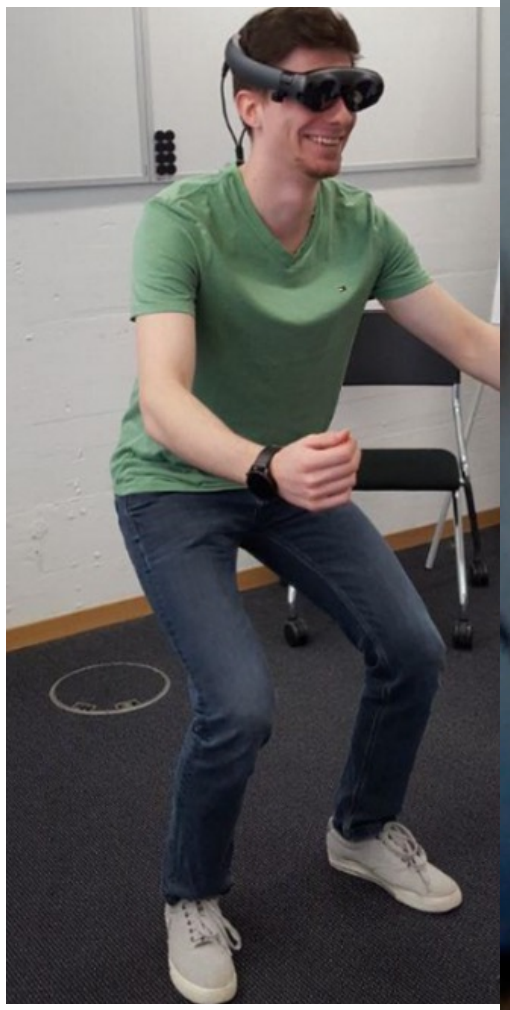
Another example



Kowatsch et al 2021a

Digital Resilience Interventions in Spatial Computing Environments

Welcome to Dr. des. Anja Bischof, CDHI Core Director for Digital Resilience Interventions

We are very happy to welcome **Dr. des. Anja Bischof**, who joins us at CDHI as our new **Core Director for Digital Resilience Interventions**. She will, for example, explore how GenAI-based spatial computing environments can be used to strengthen the resilience of individuals in public health (e.g., school children, university students) and healthcare settings (e.g. patient populations, medical doctors). To this end, Anja is also interested in contributing to innovative medical education that explores spatial computing environments for resilience training.

Anja recently submitted her Ph.D. thesis at the University of St. Gallen, where her research focused on mitigating low-value care through the adept utilization of patient-reported outcomes and enhancing patients' health literacy. Throughout her Ph.D. journey, Anja engaged in impactful projects that explored the nexus of measuring patients' well-being, identifying influential factors, and formulating strategies to foster effective communication between patients and physicians, all while prioritizing the patients' self-perceived health status. She completed both her M.A. and B.A. degrees at the University of St. Gallen.

https://www.c4dhi.org/news/a-warm-welcome-to-anja-bischof/

What can we learn from the **most successful TV shows** to **lower the socioeconomic inequalities in health**?

5. TV characters are not alone.

Characters and their “significant others”

Seong and **Oh Il-nam**

Jon Snow and **Daenerys**.

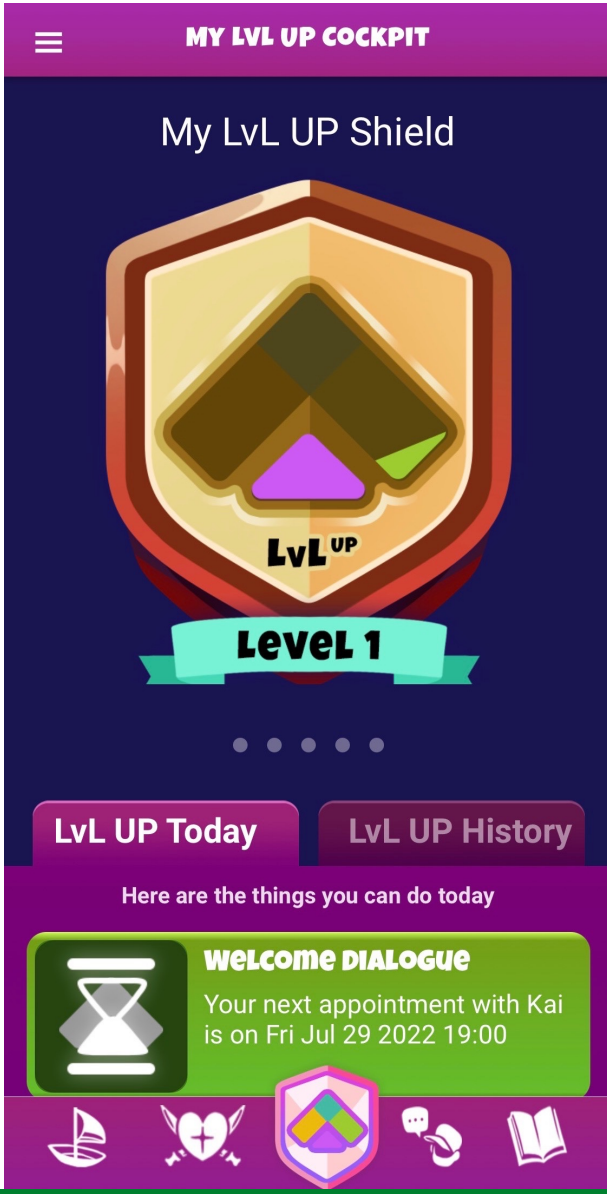
Walter and **Jesse**.

Sources Squid Game: imdb.com/title/tt10919420/?ref_=fn_al_tt_1 | and https://www.looper.com/610545/the-ending-of-squid-game-season-1-explained/ (Netflix)
Game of Thrones: imdb.com/title/tt0944947/?ref_=fn_al_tt_1 and https://www.br.de/puls/themen/popkultur/jon-snow-kit-harington-jimmy-fallon-100.html (picture-alliance/dpa)
Breaking Bad: imdb.com/title/tt0903747/?ref_=fn_al_tt_1 and https://www.kino.de/serie/breaking-bad-2013/news/das-ende-von-breaking-bad-wurde-bereits-in-staffel-2-verraten/ (AMC)

Healthcare professionals and their “significant others”

WORLD MEDIA FESTIVALS 2018 GOLD AWARD WINNER
WORLD MEDIA FESTIVALS 2019 GOLD AWARD WINNER
WORLD MEDIA FESTIVALS 2019 GRAND AWARD WINNER

Health literacy intervention for children with asthma



UNIVERSITÄTS-KINDERSPITAL ZÜRICH · KSW KANTONSSPITAL WINTERTHUR · INSELSPITAL UNIVERSITÄTSSPITAL BERN HOPITAL UNIVERSITAIRE DE BERNE · Spitalzentrum Centre hospitalier Biel-Bienne · Spital Thurgau MÜNSTERLINGEN · LUNGENLIGA · HOCHSCHULE FURTWANGEN UNIVERSITY

ROCKS flipping · pathmate · CSS

www.c4dhi.org/projects/health-literacy-children-asthma/

What can we learn from the **most successful TV shows** to **lower the socioeconomic inequalities in health**?

6. TV shows' characters talk.

Why would it be important to deliver health interventions through voice?

1. **Natural interaction**
   ("We are used to it")
2. **Hands-free**
   (e.g., physical exercise, cooking, mindfulness exercise)
3. **Increases access to healthcare for those with visual, motor, and / or cognitive disabilities**

Berube et al (2020),
Bérubé and Fleisch (in press)

Source: Smartphone store.google.com/de/product/pixel_6_pro Smart TV: samsung.com/ch/tvs/qled-tv/qn90a-85-inch-neo-qled-4k-smart-tv-qe85qn90aatxxn/ Smart speaker: https://www.amazon.de/der-neue-echo-dot-4-generation-smarter-lautsprecher-mit-alexa-anthrazit/dp/B084DWG2VQ https://www.amazon.com/dp/B06WP3HFCK "These first aid skills are for informational and educational purposes only."

Is there anything else why voice would be relevant?

"[…] **spoken animation** is the **best way** to communicate complex **health information** to people **with low health literacy**."

Meppelink et al (2015a), see also Meppelink et al (2017)

www.max-asthmacoach.ch & Kowatsch et al (2021b)

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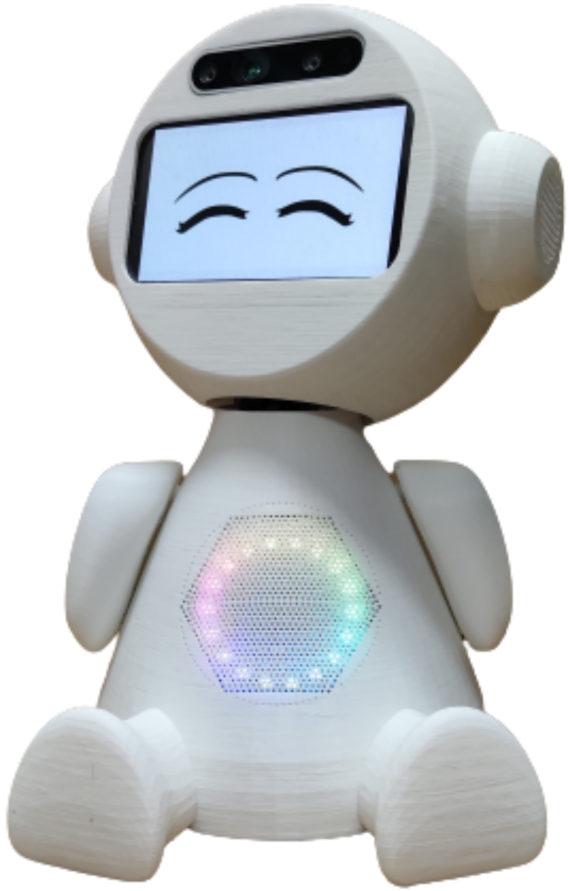
GRACE: A Voice Assistant for People with Early Dementia



Dr. Rasita Vinay

CDHI Core Director Care for Older Adults; PhD in Medical Sciences, focusing on Biomedical Ethics and Law, Faculty of Medicine, University of Zurich

In Brief

Our study aims to design, develop and evaluate a voice assistant – GRACE, that provides multicomponent lifestyle and cognitive interventions to people with early dementia.

Research Team

Dr. Rasita Vinay, Nora Tommila, Priyam Joshi & Prof. Dr. Tobias Kowatsch

Runtime

March 2023 – December 2024

Partner

Esther Brill & Prof. Dr. med. Stefan Klöppel, University Hospital of Old Age Psychiatry and Psychotherapy

u b UNIVERSITÄT BERN

PD Dr. med. Mathias Schlögl, MPH, EMBA HSG, Barmelweid

BARMELWEID

PD Dr. med. Thomas Münzer, Geriatrische Klinik St.Gallen

Geriatrische Klinik St.Gallen AG

Funding

Internal funding by the Chair for Digital Health Interventions, School of Medicine, University of St.Gallen (third-party grants are currently being reviewed).

https://eva-social-robot.github.io & https://www.c4dhi.org/projects/grace-voice-assistant-for-people-with-early-dementia/

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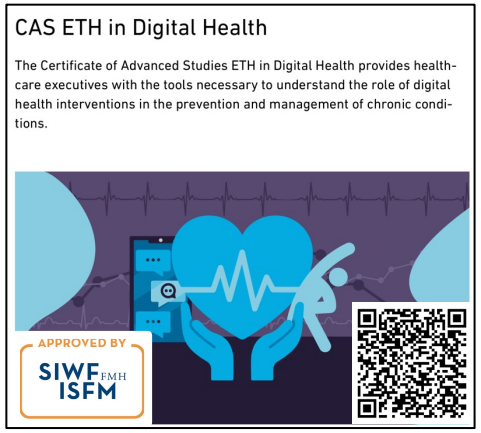
What can we learn from the **most successful TV shows** to **lower the socioeconomic inequalities in health**?

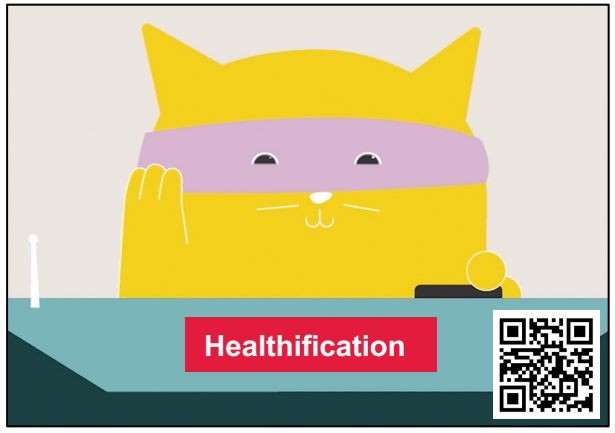
Let‘s design **digital therapeutics** that …

1. TV shows are scalable.	**heavily use widely-adopted consumer technology,**
2. TV shows are low-burden.	**leverage digital biomarkers for just-in-time support,**
3. TV shows are entertaining.	**combine entertaining and medical content,**
4. TV shows offer relatable characters.	**are delivered by relatable conversational agents,**
5. TV characters are not alone.	**involve friends and family (“significant others”), and**
6. TV shows’ characters talk.	**offer natural voice interactions.**

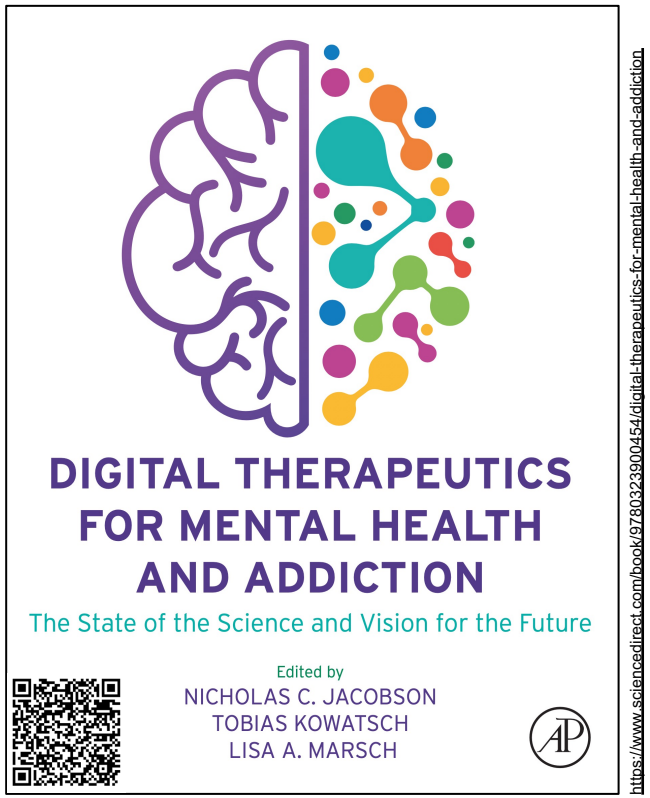
https://www.c4dhi.org/projects/what-can-we-do-to-lower-the-socioeconomic-inequalities-in-health-healthification/



https://mtec.ethz.ch/continuing-education/continuing-education-programmes/cas-digital-health.html



https://vimeo.com/748303043



https://www.sciencedirect.com/book/9780323900454/digital-therapeutics-for-mental-health-and-addiction

Prof. Dr. **Tobias Kowatsch**

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Director, School of Medicine, University of St.Gallen (HSG)
Scientific Director, Centre for Digital Health Interventions, UZH, HSG & ETH Zurich, Switzerland
Affiliated Professor, Department of Informatics, UZH
Lead Principal Investigator, Mobile Health Interventions, Singapore-ETH Centre, Singapore
Advisor, Center for Technology and Behavioral Health, Geisel School of Medicine, Dartmouth College, USA
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www.ifis.uzh.ch | www.med.unisg.ch | www.c4dhi.org | tobias.kowatsch@uzh.ch

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