International Society for Research on Internet Interventions (ISRII)

View Abstract

TITLE: Exploring the potential of existing and emerging digital health technologies in tackling non-communicable diseases and mental health conditions: Focus group study with a multi-ethnic Asian population

AUTHORS (LAST NAME, FIRST NAME): Castro, Oscar[1]; Mair, Jacqueline[1]; Salamanca-Sanabria, Alicia[1]; Frese, Bea[1]; Kowatsch, Tobias[2]; Tai, E Shyong[3]; von Wangenheim, Florian[2]; Müller-Riemenschneider, Falk[4]

PRESENTATION PREFERENCE: Oral

CURRENT PRIMARY TOPIC: Mobile health

CURRENT SECONDARY TOPIC: Next generation interventions & technology

ABSTRACT BODY:

Context: Changing lifestyle patterns over the last decades have seen growing numbers of people in Singapore affected by non-communicable diseases and common mental health disorders, including diabetes, cancer or depression. Interventions targeting healthy lifestyle behaviours through digital health technologies, including new approaches such as smartphone app-based conversational agents, may be an effective, low-cost approach to reduce the burden of these conditions. To ensure uptake and engagement with digital health interventions, it is essential to understand the end-users' perspectives on using such solutions to address lifestyle behaviour change. The aim of this study was to explore public perceptions of digital health interventions targeting healthy lifestyle behaviours in three major Asian populations from Singapore.

Methods: Six virtual focus group discussions, with a total of 35 participants (mean ± SD; aged 45 ± 3.6 years; 64.7 % females), were conducted to explore perceptions, barriers, and facilitators to the use of digital health interventions for lifestyle behaviour change. Focus group recordings were transcribed verbatim and analysed using a thematic approach.

Results: Four themes were identified: (1) holistic wellbeing (i.e., the importance of both physical and mental health); (2) uptake of digital health interventions (i.e., factors influencing an individual's decision to use a digital solution such as incentives or government backing); (3) use and engagement with digital health interventions (i.e., factors influencing an individual's decision to continue using a digital solution such as limited features available or data collection burden); and (4) emerging technologies (e.g., experiences with chatbots and their potential role in providing lifestyle behaviour support).

Conclusions: Findings highlighted a number of factors that are relevant for the effectiveness of existing and emerging digital health solutions. Deviations were found with factors that have been shown to be critical for (better-studied) Western populations.

Implications: Recommendations from this work can inform those wishing to develop and implement digital health interventions targeting physical and mental health in Singapore and other Asian countries.

(No Image Selected)

Full Manuscript: No

BY CHECKING THIS BOX, I AGREE TO PRESENT MY SUBMISSION AT ISRII 11 IF IT IS ACCEPTED:

Oscar Castro : Selected

Agreement: Oscar Castro: I attest.;Oscar:Castro | Jacqueline Mair: I attest.;Jacqueline:Mair | Alicia Salamanca-Sanabria: I attest.;Alicia:Salamanca-Sanabria | Bea Frese: I attest.;Bea:Frese | Tobias Kowatsch: I attest.;Tobias:Kowatsch | E Shyong Tai: I attest.;E Shyong:Tai | Florian von Wangenheim: I attest.;Florian:von Wangenheim | Falk Müller-Riemenschneider: I attest.;Falk:Müller-Riemenschneider

Commercial Support: Oscar Castro: | Jacqueline Mair: | Alicia Salamanca-Sanabria: | Bea Frese: | Tobias Kowatsch: | E Shyong Tai: | Florian von Wangenheim: | Falk Müller-Riemenschneider:

Other Relationships: Oscar Castro: | Jacqueline Mair: | Alicia Salamanca-Sanabria: | Bea Frese: | Tobias Kowatsch: ;TK is affiliated with the Center for Digital Health Interventions, a joint initiative of the Department of Management, Technology, and Economics at ETH Zurich and the Institute of Technology Management at the University of St Gallen, which is funded in part by CSS, a Swiss health insurer.:CSS:Other;TK is also the cofounder of Pathmate Technologies, a university spin-off company that creates and delivers digital clinical pathways. However, Pathmate Technologies was not involved in any way in the design, interpretation, and analysis during the study, or in writing the paper.:Pathmate Technologies:Other | E Shyong Tai: | Florian von Wangenheim: ;FvW is affiliated with the Center for Digital Health Interventions, a joint initiative of the

Department of Management, Technology, and Economics at ETH Zurich and the Institute of Technology
Management at the University of St Gallen, which is funded in part by CSS, a Swiss health insurer.:CSS:Other
| Falk Müller-Riemenschneider:

Exploring the potential of existing and emerging digital health technologies in tackling non-communicable diseases and mental health conditions: Focus group study with a multi-ethnic Asian population

Alicia Salamanca-Sanabria[1*], Jacqueline Louise Mair[1,2], Oscar Castro[1], Bea Franziska Frese[1,3], E Shyong Tai[1,2,4], Florian von Wangenheim[1,5], Tobias Kowatsch[6,7,5,1], Falk Müller-Riemenschneider[1,2,8]

1.Future Health Technologies, Singapore-ETH Centre, Campus for Research Excellence And Technological Enterprise (CREATE), Singapore, Singapore. 2. Lee Kong Chian School of Medicine, Nanyang Technological University Singapore, Singapore. 3. Centre for Digital Health Interventions, Institute of Technology Management, University of St. Gallen, St. Gallen, Switzerland. 4. Yong Loo Lin School of Medicine, National University of Singapore, Singapore. 5. Centre for Digital Health Interventions, Department of Management, Technology, and Economics, ETH Zurich, Zurich, Switzerland. 6. Institute for Implementation Science in Health Care, University of Zurich, Zurich, Switzerland. 7. School of Medicine, University of St. Gallen, St. Gallen, Switzerland. 8. Digital Health Center, Berlin Institute of Health, Charite University Medical Centre Berlin, Berlin, Germany.

1. Background

Changing lifestyle patterns over the last decades have seen growing numbers of people in Asia affected by non-communicable diseases and common mental health disorders (1). Interventions targeting healthy lifestyle behaviours through digital technologies, including new approaches such as chatbots, may be an effective, low-cost approach to prevent these conditions (2). To ensure uptake and engagement with digital health interventions, however, it is essential to understand the end-users' perspectives on using such interventions. The aim of this study was to **explore perceptions, barriers, and facilitators to the use of digital health interventions for lifestyle behaviour change** in Singapore.

2. Methods

Six virtual **focus group discussions** were conducted between July 2021 and February 2022 with a total of **34 participants**.

Focus group recordings were transcribed verbatim and analysed using an **inductive thematic analysis** approach (3).

Ethical approval was obtained from the Institutional Review Board of the National University of Singapore (No. NUS-IRB-2021-232).

3.1 Results: Participants

Variables	% (n), Mean ± SD
Gender (% of females)	64.7% (22)
Age	45 ± 3.6
Ethnicity	
Chinese	82.3% (28)
Indian	8.8% (3)
Arab	5.8% (2)
Malay	2.9% (1)
Employment status	
Working full time	61.7% (24)
Working part time	14.7% (5)
Homemaker	8.8% (3)
Student	2.9% (2)
Education level	
University degree	79.4% (27)
Polytechnic Diploma	11.7% (4)
Other diploma	5.8% (3)

3.2 Results: Themes identified

(1) Holistic wellbeing (i.e., the importance of physical & mental health)

Quote: *"Healthy lifestyle has two aspects, one is a physical health, which is, your diet and your exercise and the other one is your emotional health, which means to be spending time with your loved one, having some me time."* (P32, Chinese female aged 37 years)

(2) Uptake of digital health interventions (i.e., factors influencing an individual's decision to start using a digital health intervention such as incentives or government backing)

Quote: *"For me, I feel probably you need to make the app more popular first, maybe some incentive to initially just jump start. You need to make the app popular."* (P34, Chinese male aged 42 years)

(3) Sustained engagement with digital health interventions (i.e., factors influencing an individual's decision to continue using a digital health intervention such as personalisation or ease of use)

Quote: *"I think what's important is to generate more trust, for us to want to be more willing to share data, we'll like to know what actually is being done with the data and what do I get back in return."* (P6, Chinese female aged 39 years)

(4) Chatbots (i.e., experiences with chatbots and their potential role in providing lifestyle behaviour support)

Quote: *"Well, if it is still not a real person, then after all it is programming, so I wouldn't say that I have much confidence in it, because, after all, for everyone the problem is unique."* (P32, Indian female aged 37 years)

4. Conclusions and recommendations

This study adds to the limited body of literature exploring public perceptions of digital health interventions in **Asian populations**. Findings highlighted several factors that are relevant for promoting a healthy lifestyle and for the **effectiveness** of digital health interventions in Singapore and other Asian countries

1. Participants showed a generally positive attitude towards digital health interventions targeting **holistic wellbeing**, including body, mind, connectedness, and spirituality. Current health interventions, however, rarely address these elements together (4).

2. **Environment-specific barriers** to a healthy lifestyle that are unique to Singapore and other Asian countries should be considered by future intervention development teams. **Tropical weather.   The food environment**
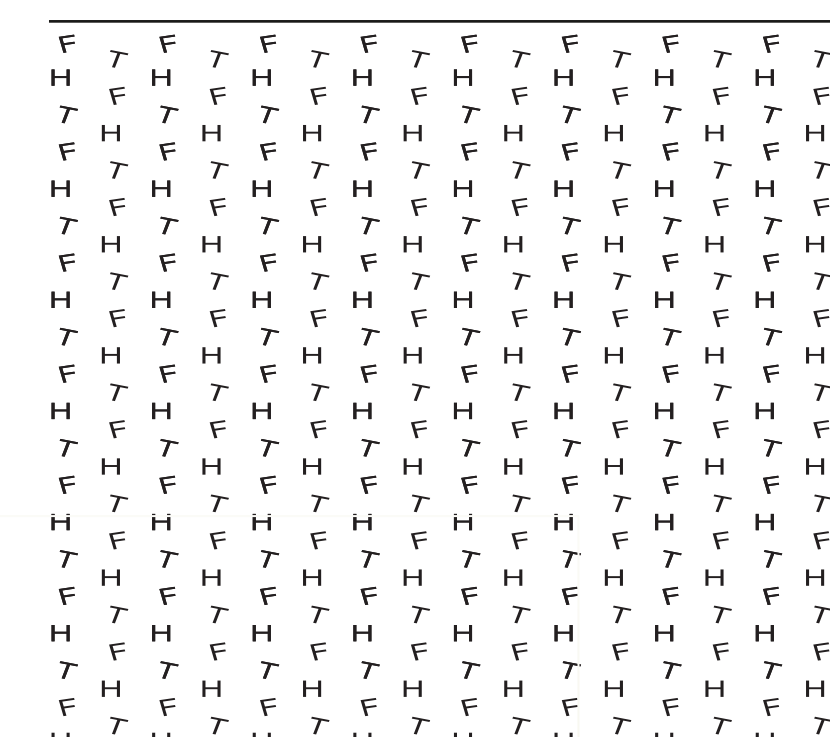
3. A noteworthy difference with Western populations is the influence that **government endorsement** has on a users' decision to start using a given digital health intervention. Participants were much more willing to share health-related data with government agencies compared to private companies.

4. The use of **incentives** was generally viewed by participants as a useful strategy to sustain engagement. Incentives in the form of redeemable points or coins are common in the Singaporean app landscape.
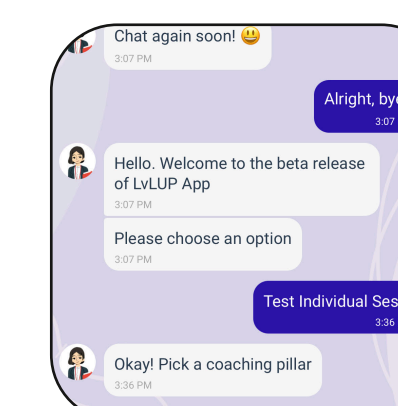
5. Participants had mostly a negative opinion towards **chatbots**. Future research is needed in the Singaporean context exploring different chatbot interaction styles, as well as identifying potential alternatives for delivering scalable digital health interventions.

(FHT) FUTURE HEALTH TECHNOLOGIES

Contact information

*Presenter: Alicia Salamanca-Sanabria, PhD
Postdoctoral researcher, Mobile Health Interventions, Future Health Technologies, SEC
Email: Alicia.Salamanca@sec.ethz.ch Address: 1 CREATE Tower 138602 Singapore, Singapore

References
1.Martinez R, et al. The Lancet Global Health. 2020;8(4):e511-e23.
2.Kowatsch T, et al : Springer; 2021. p. 71-95.
3.Braun V, Clarke (2019);11(4):589-97.
4.Chan, C. S., & Hazan, H. (2022). SSM-Mental Health, 2, 100071.

SINGAPORE-ETH CENTRE · CREATE · ETHzürich · DukeNUS Medical School · NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE · National Healthcare Group · NUHS National University Health System · NUS National University of Singapore · SingHealth