

Reflections from the 2022 CREATE Workshop

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As we approached the impressive main building of Comenius University Bratislava for the first day of the 2022 EHPS Collaborative Research and Training in the EHPS (CREATE) Workshop, the historical significance of Šafárikovo Square, the area of the city in which the university is situated, became immediately apparent. Freshly laid wreaths beside a nearby memorial plaque commemorated the 54th anniversary of the occupation of Czechoslovakia by Warsaw Pact troops and represented a small part of wider activities across the city during the week of the EHPS conference to remember the events and hear the stories of those affected by the legacy of August 1968. At the CREATE orientation dinner and subsequent drinks the previous night, we had encountered nothing but welcoming and friendly people. Our university hosts were no exception as they cheerfully greeted us in the lobby and guided us to the room in which the two-day workshop would be held.

The focus of the workshop facilitated by Professor Felix Naughton and Dr Olga Perski, was on digital health interventions for behaviour change. Digital health relates to the use of digital technology to improve health and healthcare, and comes with several benefits, including cost-effectiveness, versatility, and inclusivity. Recent technological advancements have expanded the

potential for digital health tools to transform the experiences of patients and clinicians in managing a vast range of health outcomes. The importance of using digital technology for health is recognised in the World Health Organisation's Global strategy on digital health 2020-2025. Given all this, there was great interest from both authors of this report going into the CREATE workshop. The workshop's theme was also highly relevant to Rory's PhD topic, so it promised to be a highly useful learning experience that could be applied to his research.

Professor Naughton and Dr Perski delivered an engaging and comprehensive workshop that focused on digital health intervention design, development, evaluation and implementation. Prior to the workshop, we had been asked to use one health behaviour change or wellbeing app to change something in our lives for at least week. On the morning of the first day, we were asked to reflect on both our experience with the app, and how engaging we found it to be. This reflection exercise served as the springboard for a discussion on the use of apps for health behaviour change, in terms of their applications and limitations.

Another key learning outcome from Day 1 was the concept of programme theory and the logic model. A programme theory explains how an intervention contributes to a chain of results that produces actual impacts, while a logic model is a diagram used to represent a programme theory, demonstrating the logic of how an intervention functions. We were shown several examples of a logic model, which was helpful in understanding the multi-stage process of intervention

development and implementation. Next, we spent time on the topic of measurement. We learned about ecological momentary assessment (EMA), which can be defined as real-time assessments of phenomena over time in a naturalistic setting (Stone & Shiffman, 1994). EMA methods can be used in a variety of contexts, such as in smartphone apps, wearable devices, and SMS messages, depending on the phenomena of interest.

Another key learning outcome from day 1 concerned user-centred intervention design. User-centred design means ensuring that the needs and values of both end users and stakeholders are considered, and it involves mutual learning and collaboration among users and designers. Next, we learned about the differences between using an existing health behaviour change app, versus creating a new one from scratch, versus a collaborative approach. The 'off-the-shelf' approach is easy to set up, and comes without development costs, but the researcher has no control over the content of the app. In the collaborative approach, the researcher has an opportunity to influence the content, but they may not always be able to influence how much (or what kind of) data is being collected. Finally, the 'make your own' approach affords a high degree of control over both the content and measures, but comes with a greater cost, and may face additional barriers to user experience and compatibility with devices than other, readily available apps.

The final key learning outcome from the first day was in relation to just-in-time adaptive interventions, or JITAIs (which is a fun acronym to say out loud). This is an intervention that can provide the right type and amount of support, at the right time, dependent upon a user's variable internal, contextual and environmental state. A key component of JITAIs is tailoring: when some kind of input informs how and/or when the intervention is provided to the individual. The effectiveness of JITAIs can be assessed using

proximal (momentary) or distal (longer-term) outcomes. Identifying which tailoring variables to consider is also critical – tailoring variables can be based on either theory or empirical research. Newly emerging techniques, such as the use of machine learning algorithms, could enhance JITAIs by aiding in the selection of tailoring variables and predicting proximal outcomes.

Following a short recap of the previous day's learning, the second CREATE Facilitator, Dr Olga Perski, began the day two session by guiding us through research methods to optimise and evaluate adaptive interventions. It was highlighted that while classical randomised controlled trial approaches allow for determining whether an intervention performs better overall than a control or comparison group, this approach may not always be optimal for digital health interventions due to not allowing researchers to easily distil which components of multicomponent interventions are causing the behaviour change (Peters et al., 2015). Therefore, alternative frameworks for the development, optimisation, and evaluation of multicomponent behavioural, biobehavioural, and biomedical interventions such as the Multiphase Optimisation Strategy (MOST; Collins et al., 2005), may enable researchers and practitioners to make interventions more effective, efficient, and scalable.

Next, we explored a range of methodologies to optimise and evaluate adaptive interventions, including Sequential Multiple Assignment Randomised Controlled Trials (SMARTs), Micro-Randomised Trials (MRTs), and intensive longitudinal designs. Throughout the workshop, we were introduced to relevant research which applied such theoretical frameworks and methodological approaches. We found this particularly useful, as we could better understand how to implement different designs within various contexts, including how novel technology-mediated measurement approaches like SMS reminders could assist data collection.

Throughout the two days of the workshop, we were tasked with developing a programme theory for a digital health behaviour change intervention. In groups, we had to initially identify a problem that we were interested in, and the determinants of the behaviour of interest. Marc's group presented 'Joint Effort', an educational and digital behaviour change mobile app for individuals with osteoarthritis. Rory's group developed a digital intervention to improve sleep hygiene among adolescents. Both of our apps would be codesigned with health professionals and would provide patients with personalised behaviour change activities which would fit with users' requirements and goals to improve both proximal and distal health outcomes.

Using a logic model, we had applied some of what we had learned about user engagement and overcoming the 'engagement crisis', something which we discovered was a major issue for digital interventions due to low engagement being associated with unsuccessful behaviour change. We had considered how to collect data and monitor the long-term effectiveness of the intervention, in addition to the quality, user satisfaction, and effectiveness evidence thresholds we would need to adhere to for the app to be regulated and accredited on a curated app portal. It was interesting to hear the ideas from the other groups and enhanced our understanding of the workshop content overall. We left the CREATE workshop feeling like we had learned and achieved a great deal, and were looking forward to attending the conference in the coming days.

The CREATE workshop was a tremendously valuable prelude to the EHPS Conference itself. For many attendees of this fantastic workshop, including ourselves, it was the first post-covid opportunity to meet with fellow students and academics. The fantastic networking events facilitated by the CREATE committee and meant that workshop attendees recognised lots of familiar faces throughout the rest of the week.

Furthermore, the content of the workshop was highly complementary to both Rory's MSc in Health Psychology training and Marc's postdoctoral research and linked foundational training with emerging and innovative concepts.

CREATE provided all attendees with a welcoming and supportive space in which to learn, exchange ideas, and make professional and social connections that will last a lifetime. It was fascinating but unsurprising to learn that both Felix and Olga had also attended CREATE as early career researchers and have remained collaborators ever since. Both Rory and Marc, too, have since developed a good working relationship, culminating in our own collaboration to write this report. Whilst we are at different stages of our academic journeys (with Rory being a PhD candidate and Marc being a post-doc), we both gained a valuable insight into the application of and challenges to behaviour change research using digital health technology.

We would like to thank everyone involved in organising the CREATE workshop and we are thoroughly looking forward to attending again next year.

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