



# The Value of eCoaching in the COVID-19 Pandemic to Promote Adherence to Self-isolation and Quarantine

Jan Willem Jaap Roderick van 't Klooster<sup>1</sup>(✉), Joris Elmar van Gend<sup>1</sup>,  
Maud Annemarie Schreijer<sup>2</sup>, Elles Riek de Witte<sup>1</sup>, and Lisette van Gemert-Pijnen<sup>2</sup>

<sup>1</sup> BMS LAB, Faculty of Behavioural, Management, and Social Sciences, University of Twente,  
Enschede, The Netherlands

[j.vantklooster@utwente.nl](mailto:j.vantklooster@utwente.nl)

<sup>2</sup> Department of Psychology, Health, and Technology, Faculty of Behavioural, Management,  
and Social Sciences, University of Twente, Enschede, The Netherlands

**Abstract.** A Digital electronic Coach (eCoach) app was built and evaluated during the Covid-19 pandemic in The Netherlands. Its aim was to provide support for individuals that had to either quarantine or self-isolate after a positive corona test or an indication of a heightened risk of infection. The coach (“IsolationCoach”), its value and uses were evaluated in 29 semi-structured interviews with individuals who had quarantined or isolated themselves or were part of the general Dutch public. Three main findings emerge. First, participants found value in a digital coach that would help them comply with quarantine or isolation instructions and provided information on the practical challenges of organizing their quarantine or isolation. Second, the usage of the app, which gradually and conditionally provides relevant information as opposed to conventional paper pamphlets/email, was greatly appreciated. Third, participants experienced a need for mental support during their period of isolation or quarantine, and this could at least partially be filled by the eCoach, which provided emotional support through a Socratic method styled form of self-reflection. It was beneficial that the app was implemented rapidly within weeks using a ready-to-use platform and that its content was assessed by experts from various health-related disciplines prior to rollout. Yet, for large-scale implementation, an integrated vision and digital strategy is needed to align forms of support by the health authorities.

**Keywords:** Isolation · Quarantine · COVID-19 · Ecoaching

## 1 Introduction

The ongoing corona pandemic and associated crises caused by the Novel Coronavirus presents the world with many new challenges [1]. One challenge of key importance is to limit contact between people to prevent further spread of the virus, also known as social distancing. Tried and tested public health measures such as campaigns promoting hygiene, information campaigns and contact tracing have been used to promote healthy

behaviour and reduction of viral spread. The pandemic has seen the development and deployment of more novel approaches as well, such as digital (and anonymized) contact tracing through apps, large scale (partial) lockdowns and mass testing [2, 3].

Infected individuals or individuals of which it is suspected that they are infected, however form an essential but specific group. The limiting or removing of their contact with other people is both essential and has proved challenging [4]. The effectiveness of measures aimed at limiting their contact with the general population in many cases hinges upon the individual's participation.

Research from the Duth Healthcare Authority's Behavioural Unit [4] showed that quarantine obligation is oftentimes not adhered to. In particular non-adherence is: after travelling to high-risk foreign countries (70.5%); when experiencing symptoms (68,2%); when a member of the household has symptoms (53%); after local health authority notification (e.g. contact tracing) 41.4%; when a member of the household tested positive (34.5%); when tested positive oneself (17.8%). These numbers clearly demand multiple interventions aimed at improving adherence.

In this paper, a novel method to promote social distancing and advised behaviour for people that should quarantine or self-isolate is introduced, using personalised app-technology to promote the advised behaviour for these people-at-risk. As such, this app provides an innovative way to promote and facilitate self-isolation rules during the pandemic and in the process provide value in both practical and emotional support to users.

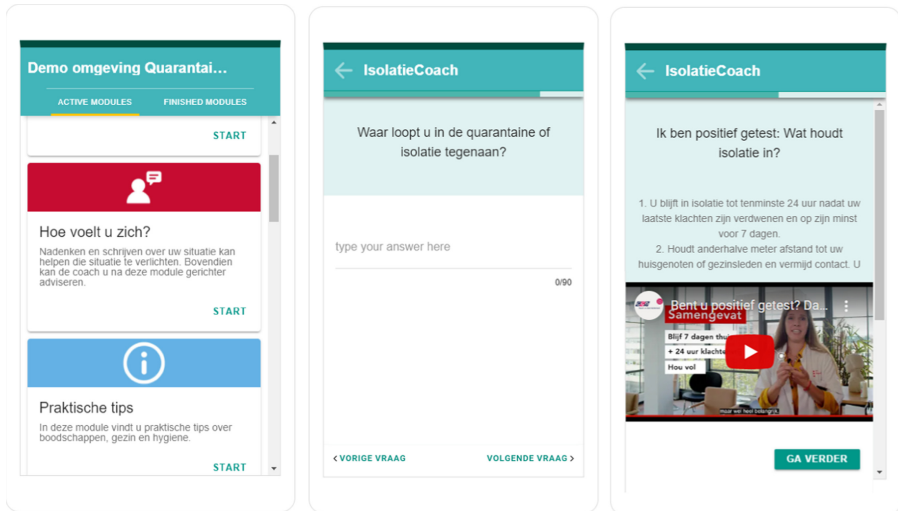
The rest of this paper is structured as follows. In the following section, the methods that led to the design and implementation of the app are described. Then, the main results are described. Finally, a discussion and conclusion are presented as well as possibilities for future work.

## 2 Methods

Using the configurable app platform TIIM [5, 6], an ecoach was created. Two brainstorm sessions were held with health psychologists, computer scientists and ehealth experts to come to the design of the ecoach and a set of modules to provide elearning on various aspects. These modules included knowledge transfer on self-isolation, hygiene, work, shopping, seeing family, a quiz to test knowledge, and the possibility to reflect upon the situation. The latter aspect is based upon the Socratic method [7], entailing that expressing feelings about one's situation helps coping with them. The content texts in the ecoach were discussed with experts from the Dutch Municipal Health Services (GGD) and national health authority (RIVM) before implementation.

After a pilot test, implementation was done in the municipality of Dronten, The Netherlands, where the app (see Fig. 1) was tested among other health interventions. A reminder mechanism using push notifications was used to send users of the app reminders after a few days when new modules became available. To evaluate the app, interviews with users of varying age groups were held. The evaluation consisted of  $n = 29$  interviews with both indices (persons) tested positive, as well as people that had to adhere to a quarantine period. The interviews focused on perceived value, usability of the tool, and potential for improved adherence to the isolation rules. A questionnaire to obtain metrics

about the app appreciation was given at the end of the interview to obtain standardized metrics including the Net Promotor Score. The complete procedure of the evaluation was assessed by the Ethics Committee of the University of Twente under no. 210075.



**Fig. 1.** Screenshots of parts of the isolation coach app. Left: Start screen with different active modules, made available over course of time, with a.o. practical tips and reflection tasks. Middle: a self-reflection module with a question to be answered by users on barriers experienced. Right: informative video on isolation and applicable measures.

### 3 Results

In total, 29 Dutch speaking individuals were interviewed. Participants were gathered through convenience sampling at a pilot event lasting more than a month held by the Dutch Municipal Health services in the Dutch municipality of Dronten. The event aimed to test and retest the entire population of Dronten in a time window of six weeks as a means of identifying and containing a local severe outbreak. All participants had needed to quarantine or isolate themselves in the period in which the study was conducted. Slightly more than half ( $n = 17$ ) identified as female, the others as male. The youngest participant was 22 and the oldest 86 ( $SD = 18.5$ ). Participants predominantly enjoyed a high level of education with 18 participants having followed university level education or equivalent. A smaller group ( $n = 6$ ), were educated up until high school or trade school. Lastly, 5 participants had elementary school level education, mid school or a basic qualification (MBO level 1 or 2). The sample was not representative of the Dutch population.

Overall, the participants evaluated the Isolation Coach positively, rating it with a mean score of 7.7 ( $SD = 1.07$ ) out of 10. Participants rated the coach on several sub aspects as well. Most positively rated was the user friendliness with a mean of 8.1 ( $SD$

= 1.34). The contents were rated with a mean score of 7.5 (SD = 1.19) and the design with a mean of 7.7 (SD = 1.07). Participants evaluated four modules with each their own purpose as well. First, they rated the personalisation and length of generic quarantine and isolation instructions with a mean score of 7.6 (SD = 0.093). Second, the practical information aimed at supporting participants in reorganizing their lives and safeguarding their income was rated with a mean score of 7.4 (SD = 1.05). Third, the regular check-ups and mental support was rated with a mean score of 7.1 (SD = 1.74). Fourth, the module checking whether they had met the conditions to leave quarantine or isolation and which contained follow-up instructions was rated with a mean score of 7.4 (SD = 1.60).

Participants were asked to indicate what brought value to their experience with the IsolationCoach. The bite sized and contextually relevant instructions were most often mentioned (n = 18) as a value adding factor. The use of an interactive app as the platform (n = 8) was mentioned second most often and the additional (mental) support (n = 5) third most often.

Participants were overwhelmingly positive about the overall value of the IsolationCoach. A large majority (n = 22) would surely (n = 10) or probably (n = 12) recommend the IsolationCoach to others. A smaller subset of 5 participants would not recommend the IsolationCoach to others.

A survey conducted during the pilot amongst the general population of the municipality of Dronten helped provide an image of the motivations of those who hadn't used the IsolationCoach. Amongst all participants in the larger municipality wide trial who returned the questionnaire (n = 134), most often mentioned as reason for not using the IsolationCoach was the lack of a motivation to do so. The app was deemed not necessary (n = 18) or lacked clear value (n = 8) to them. Others were unaware of its existence (n = 4) or forgot (n = 3) to use the app. There were no promotional activities undertaken for the coach and thus participants needed to actively download the app to start. Moreover, during the pilot it was established that 1% of the people who tested positive for COVID would download and use the IsolationCoach. A physical isolation coach that would regularly call and offer support to those in isolation or quarantine received similar support from the general public.

## 4 Discussion

In general, the Digital Isolation Coach was perceived positively by the participants. Both the app's user friendliness and value were rated highly. The eCoach was shown to be a tool with which instructions which were otherwise perceived as complex, could be chopped up in digestible chunks which were relevant for the individual participant's evolving context (e.g. when they would move from quarantine to isolation due to receiving a positive test). The possibilities concerning the use of multimedia content was a large part of what participants appreciated. Moreover, the psychological support provided through the invitation to participants to contextualize and evaluate their own situation, was greatly appreciated. Participants indicated to have a latent need in this area.

The usage of a generic ready-to-use app framework that allowed the establishment of the tailorable ecoach, without programming and within 2 weeks lead time, worked out great and was very valuable for this project.

For organizations active during a pandemic or health crisis, the IsolationCoach provides evidence of the effectiveness of eCoaching as scalable and personalizable instrument for both the increase in compliance and improving the general information position of affected individuals. Moreover, the digital nature of the coach means that it can be updated to reflect the latest information, instructions and advice to work optimally in the current situation. This provides a clear benefit in fast moving crises, like the Covid-19 pandemic. Already, quarantine rules are changing (e.g. because of vaccination) and hence become unclear to the general public. An important note for organizations responsible for the creation or implementation of an eCoach, is that they should do so with a distinct awareness of the whole context in mind. That is to say that such a tool's effectiveness is believed to be optimal when integrated in a broader toolset which has a clear goal and narrative [8–10].

Although 'a coach in your pocket' can provide clear benefits over static text, leveraging knowledge testing, interactive media, and reminders, solely providing it to the audience without further implementation and guidance has only limited benefits over the standard email text with instructions sent to the inbox.

## 5 Conclusions and Directions for Further Research

The app tested in this research, offers interactive information of the policies valid for self-isolation and quarantine. The app offers multimodal, practical information tailored at the personal situation (e.g. freelancer vs employed). Using the app, knowledge can be accessed in the right portion at the right time. Also, the app offered moral support and self-reflection support using the socratic method.

The app was designed from the knowledge that adherence to covid rules is poor. Although developed under time pressure, it was beneficial that the content was assessed by various experts, including medical experts, behavioural scientists, health scientists, ehealth specialists and psychologists. Also, a ready-to-use platform to be able to deploy the ecoach was crucial.

In this research, the ecoach developed was shown to be appealing and user friendly, based on 29 interviews with end users, from varying educational levels.

In a next phase, the scaling up of digital support in the pandemic should be researched more widely as well as a controlled test for effectivity. This will be challenging as the local health authorities face difficulties in implementing change and lack the embracement of an innovative culture. As pointed out by [8], there is a lack of an integral view on the implementation of an effective digital strategy, and a standalone rather than an integrated approach is being followed. The support by the app should be aligned with other forms of support by the health authorities, and not via additional chains and institutions. Otherwise, the low uptake (1%, comparable to physical isolation coaches) seen in this pilot study will likely not be improved, because of fear of data privacy, hesistance, and resistance to the unknown.

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