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University of Maribor Press

eHealth WhatsApp Group for Social Support: Preliminary Results

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Abstract Within groups that are starting a healthy lifestyle intervention together, there is potential for social e-support, as an addition to individual coaching. However, the support technology should be low-tech, low-threshold and preferably already omnipresent. A WhatsApp group was chosen as support tool, given the large variety of groups normally coached: from elderly, IT-phobic diabetics to highly educated young professionals. In this explorative pilot study, 11 young professionals volunteered. Despite their time-constrained schedules, 81 user inputs were generated in the first weeks, and the users valued the WhatsApp group as an attractive social support addition to the existing eTools and personal coaching which have a more functional focus on individual progress. Based on preliminary results: a) the WhatsApp group generated higher participation than most other social media, b) deploying social media use motives, c) possibly due to the relatively high 'presence' and 'engagement' attributes of WhatsApp, and d) contributing to healthy behaviours and health advocacy.

Keywords: • eHealth • WhatsApp Group • Peer Coaching • Service Design •

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1   Introduction

In academic thinking, like the HAPA (Health Action Process Approach) model
(Schwarzer 2008, Lippke 2009, Wiedeman 2011) and i-change model (De Vries 1998),
as well as in the design of eHealth solutions (Simons 2010), the initial focus often tended
to be largely aimed at the functional level. For example, three health behaviour
improvement phases that are often mentioned in this line of thinking are: firstly raising
health awareness, secondly developing intentions and making plans, plus thirdly
implementing health behaviours (including coping, experimenting, improving,
sustaining). Thus, health behaviour improvement appear to revolve around setting goals
and achieving them.

However, in working with type 2 Diabetes Mellitus (DM2) patient groups over the past
years, we observed multiple user needs and behaviours regarding affective social group
support. For example, in the short term of making the first twelve weeks of healthy
lifestyle improvements, patients saw each other three times per week for physical training,
but they also used that time for sharing experiences, exchanging ideas, showing how well
they were doing (or not), celebrating successes and making fun of each other (Simons
2016). And in the longer run (50 weeks), even though the collective training was over,
the group spontaneously organized to continue seeing each other once every month
(Simons 2017). This triggered us to think how we could provide a more continuous,
omnipresent support on the emotional- and group level?

However, regarding technology use, several patient groups tend to be relatively ICT-
illiterate and/or even have an ICT-aversion. Still, smartphones are ubiquitous now in the
Netherlands, as are messaging and the sharing of photos and videos. Thus, a WhatsApp
group was chosen as support tool for an explorative pilot study, being low-tech, low-
threshold and omnipresent. In order to test robustness across user groups, this study
focusses on preliminary results from a healthy lifestyle group of young professionals.

The WhatsApp group is offered as a voluntary addition to an existing eSupported Health
Coach Program, comprising of a personal coach plus multiple eHealth tools described
elsewhere (Simons 2010b, 2014, 2016). The pre-existing eSupport has a rather functional
focus: aimed at diagnosis (health behaviours, levels of physical and mental health), health
awareness and -literacy, experimenting with new health behaviours, plus fitting them to
personal preferences and agendas. Also, the focus is largely on the individual and his/her
family. The question in this explorative pilot study is whether the WhatsApp group offers
emotional- and group level support.

A special challenge is the degree of participation; in other social media over 90% of users
only consume, but do not participate in the sense of providing responses or inputs
(Nonnecke 1999).

Research Question:
- Does the WhatsApp group have added value by harnessing social motivators (like connecting with each other, sharing experiences or showing your best) and affective motivators (like pride, having fun, encouragement or compliments)?

2   Theory

As explained in the introduction, we focus on in this paper on the *social and affective support that the WhatsApp group may add* to the functional health support existing in the eSupported health program. While using a persuasive technology approach (Fogg 2002, 2009, Hamari 2014) to stimulate healthy behaviours, there were three types of service design goals present in this pilot study, which we describe below, see also Table 1.

First, the overall purpose of the eSupported health program is promoting long term (> 12 months) healthy patterns. Thus the focus in not on short term dieting or exercise activities, but on developing a health identity (including health perceptions and habits) which supports long term health behaviours (see also Simons 2015 for a more detailed explanation of the health competencies that almost 'automatically' contribute to long term health). One of those long term fundaments is developing a positive health identity (including self-norms, health literacy and -beliefs). One type of digital behaviour that can often be seen in social media like in Strava or Runkeeper Apps (Simons 2013, 2014), as well as Facebook, WhatsApp or YouTube (Khan 2017) is 'Showing my best' and encouraging/supporting each other in that behaviour. In social media the underlying motive for posting contributions is often called 'Self-Status Seeking' (Park 2009 , Khan 2017), but it is also similar to health-related feeling good about yourself (Fuhrman 2005), becoming a better person (Paffenbarger 1996) and developing friendship and pride (Reiss 2004). The next type of health identity behaviour has to do with 'becoming *your own version* of a health person'. In the first experimentation weeks of the program, it is important to explore which health behaviours fit your personal preferences, as well as your social- and agenda-contexts (Simons 2017b). In this 'learning to understand how health behaviours work for me' phase, see Table 1, it helps to exchange ideas and share examples with others.

Second, the WhatsApp group pilot had the service design goal of fostering peer coaching via advocacy for three domains of health behaviours: healthy diet, physical activity and mental energy, see Table 1. These are also the health domains the focus of the eSupported health program. A mechanism making this peer coaching goal especially interesting for us, is something we observed in previous groups (Simons 2016, 2017) as well as in 'super-survivor' roles in resilience literature (Southwick 2012). In this resilience literature, three levels of competence are distinguished, with thus two possibilities to step up. First, people can move from low levels of [health] competence and self-efficacy (on occasion 'falling *victim*' to the effects of ineffective behaviours and coping styles) to the middle level of '*survivor'* where competence and coping levels are quite adequate. But the most interesting step is when previous 'victims' become 'super-survivors' (Southwick 2012), teaching others how to grow. In this process they use their own victim pitfalls/experiences

as assets to better understand, empathize and coach others. When certain people in a health group become 'super-survivors' this is a win-win: it further stimulates their own health identity and it provides additional support and inspiration for the other groups members. Conceptually, super-survivors can be seen as a strong form of advocates, role models, or peer coaches (Prochaska 1997, Southwick 2013, Thom 2013).

Table 1: Service Design Goals of WhatsApp Group, Added to eSupported Health Program

1. Health Identity/Literacy	2. Peer Coaching/Advocacy	3. Social Support Motives
A. Showing my best and celebrating progress. B. Learning to understand how health behaviours work for me.	A. Healthy diet. B. Physical activity. C. Mental energy.	A. Asking/giving practical support. B. Asking/giving affective support. C. Fun and humour.

The third design goal of the pilot is to support social interaction motives and use them to stimulate a healthy lifestyle. When looking at the user motives from the Uses and Gratifications Theory (UGT) of social media research (McQuail 2010, Khan 2017), the 'Self-Status Seeking' motive was already addressed with motive 1A, showing my best. Next, there are two rather functional UGT motives: 'giving information' and 'seeking information.' In the context of a health intervention, this generally means asking and giving practical information, see motive 3A in Table 1. Next, there is the 'social interaction' motive, in this context of health support, taking the form of asking and giving affective support and feedback, see motive 3B. Finally, there is the 'entertainment' motive, see 3C 'Fun and humour' inputs listed in Table 1.

In the next section we explain how we use the design research approach in this pilot study.

3 Methods, Study Design, Intervention

In this section we discuss our design research approach and explorative pilot study. Regarding our design research approach, we follow the design cycle of Vaishnavi & Kuechler (2004): from problem awareness and solution suggestion to development, evaluation and conclusion.

At the end of January 2018, a group of 15 employees from academia started with an eSupported healthy lifestyle program. On their start day, 11 of them volunteered to participate in the WhatsApp group support pilot, after reading the pilot study information and signing consent forms. They were a highly international group of scientists (China, Italy, Latin America, Netherlands, South-Africa, Ukraine, Greece, Iran, India) from different disciplines at the Delft University of Technology: Postdocs, tenure trackers, assistant professors and the majority were PhD candidates. A first important characteristic of this group is that they are very time-constrained. They experience a high work load (as confirmed with intake surveys) and only want to spend time on (health- or other) activities if they are deemed useful for their performance as professionals. Secondly, the majority

of them are young professionals, in their first or second job, and relatively unexperienced in managing work-life balance or ensuring healthy choices. It is not uncommon in this group to observe unhealthy belief/behaviour patterns like: 'I am not productive enough -> I will skip my breaks -> I lack energy -> I need more sugar.' Or sacrificing sleep, or exercise, or socializing, for the sake of working longer hours. Or other unhealthy 'corporate athlete' (Loehr 2001) patterns. Thirdly, 80% of participants had a Mental Health score (RAND-SF8, Ware 1998) below the overall Dutch average (for all age groups combined), even though their average age was below 35 years old. Thus a 20% Mental Health score below average would have been more appropriate instead of 80%.

During the pilot of nine weeks, all WhatsApp user inputs are anonymized, counted and clustered based on their contributions to the design goals. Two of the authors conducted the clustering independently and then discussed results in order to reach unanimous scores. Besides the user inputs analysis, subjective user evaluations are collected. We asked them to evaluate WhatsApp group contributions to the design goals (5-point Likert scale, plus explanations, extracted during telephone interviews). This paper reports on the preliminary results in February, based on the first two weeks of the pilot.

Our research method follows three steps: a) As 'awareness' and 'suggestion' steps: Formulate possible social and affective WhatsApp user contribution motives that suit the design goals of the WhatsApp pilot (this step follows solution suggestions in the abduction step of Vaishnavi and Kuechler; this study does not test the underlying assumptions, but takes them as a stepping stone: section 2). b) As 'development' and 'evaluation' steps: Adding the WhatsApp group support pilot to existing eSupported health program, plus evaluation: quantitatively based on numbers of user inputs per design goal, plus qualitatively, based on user feedback (deduction step of Vaishnavi and Kuechler: section 4). c) As 'conclusion' step several design lessons are drawn, for practice as well as theory, see section 5.
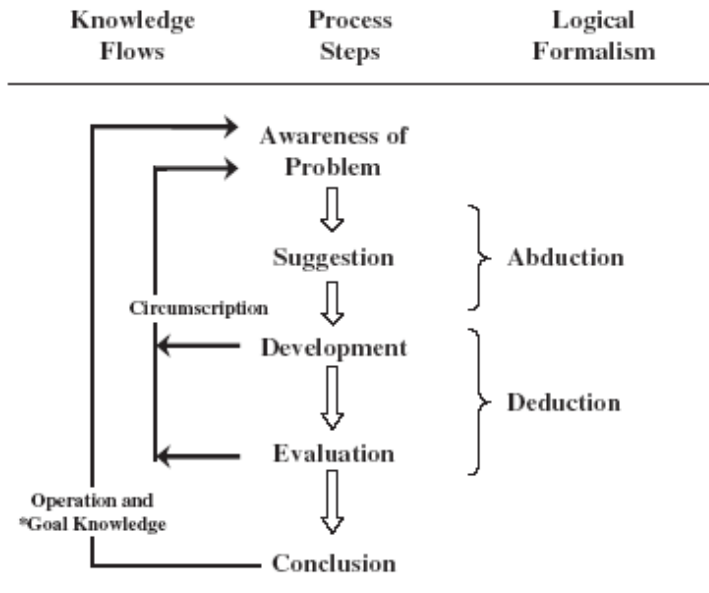
Figure 1: Design Cycle Knowledge via Design Iterations and Evaluations (Vaishnavi 2004)

The WhatsApp group is an add-on to an existing eSupported health program

The WhatsApp group support pilot is an add-on to an existing eSupported health program, which combines coach sessions with electronic dashboarding and self-management, plus electronic health tips and a digital health quiz game. Key functionalities are (Simons 2010, 2014, 2015):

- A personal online health dashboard with graphs of progress towards adherence targets on the various health behaviours;
- Automated feedback on lifestyle aspects where positive scores have been achieved (nutrition, physical activity, stress management or an overall score);
- (Tele)coaching by a health coach, generating online coach reports on progress towards adherence targets in the personal dashboard;
- Options to ask questions to the coach: via messaging within the dashboard or via email;
- Online schedule indicating upcoming events: group sessions, individual coach sessions (when and where), physical measurements, surveys;
- A micro-learning Health Quiz accessible via smartphone, mail and/or web;
- Reading materials in the mail;

- Weekly tips via email on health, motivation and self-management;
- Besides individual coaching, group sessions are also used in order to stimulate group support, mutual inspiration and encouragement, plus peer education.

4   Results

In this section we discuss the preliminary results of the first two weeks of the pilot in Feb 2018. Besides the WhatsApp group activity, participant activities in the rest of the eSupported health program were: a full day workshop at the start, intake interview and questionnaire, using the Health Quiz and other eTools, and an individual health coach session in the first week after the start workshop. These participant activities were conducted alongside their busy jobs.
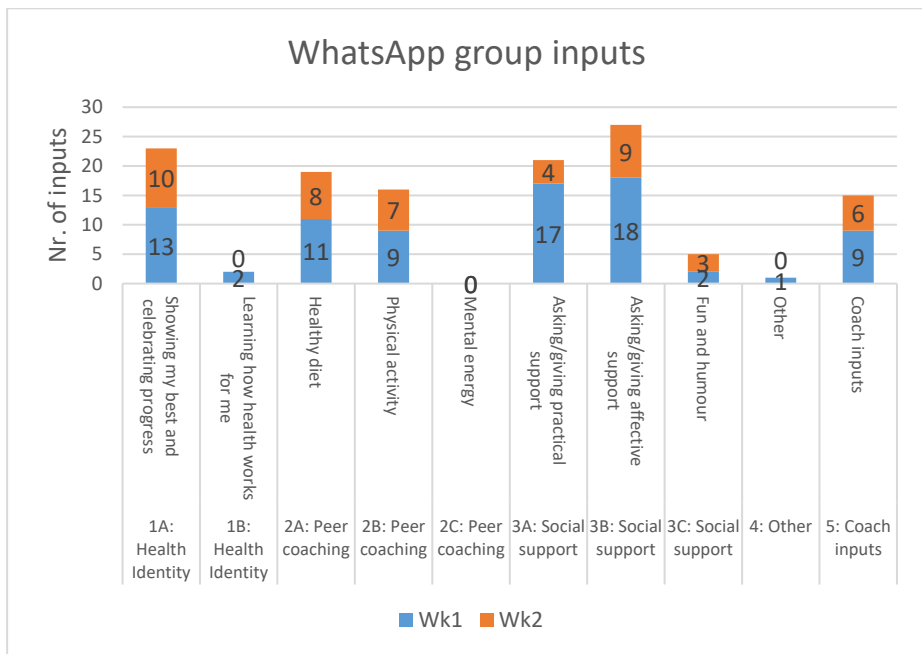

Figure 2: WhatsApp user & coach inputs in weeks 1 and 2, on the service design goals.

With this group of n=11 participants, 81 inputs in total were collected in the first two weeks, of which 15 coach inputs (who were part of the WhatsApp group to help the group along) and 66 participant inputs, see Figure 2. Some inputs qualified for more than one goal, hence the sum of scores are higher. The first cluster, 'Showing my best and celebrating', of the first design goal (fostering health identity and literacy) received relatively many (n=23) inputs. Regarding the second design goal (peer coaching and advocacy), the first two clusters ('Healthy diet' and 'Physical activity') received n=19 and n=16 inputs respectively, whereas 'Mental energy' received none, which is a paradox in comparison with their mental energy challenges (see section 3) and which we address

in the discussion section. The third design goal of social support received respectively: n=21 practical support inputs, n=27 affective support inputs, plus n=5 fun inputs. This suggests a tentative 'yes' on the social and affective support goals of the research question.

Figure 3 displays the distribution of inputs across participants. As often with social media inputs, the distribution is highly skewed (Nonnecke 1999) with one participant generating n=29 inputs and three participants inputting less than two. These three participants were the only Chinese participants in the group, see also the Discussion section.
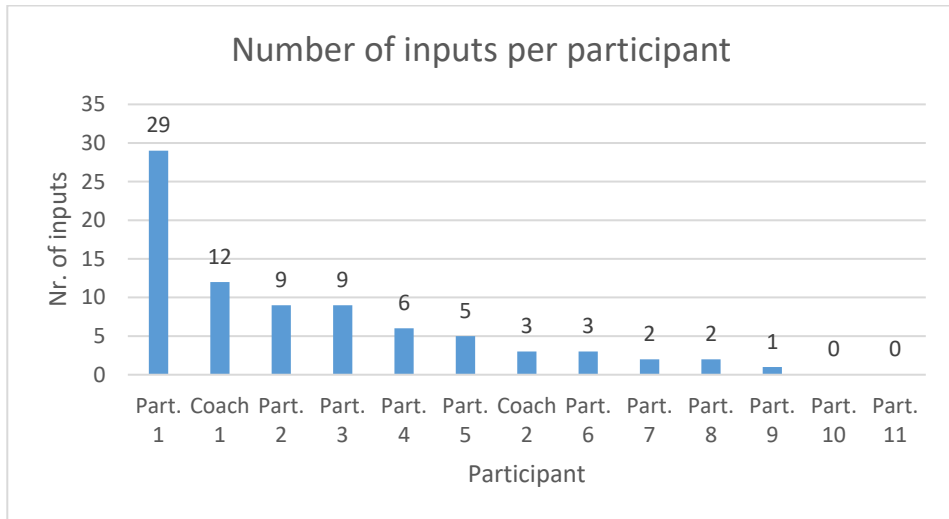

Figure 3: WhatsApp input distribution across participants.

The final study results stem from the user evaluations, see also Table 2. The first design goal of developing a health identity is least recognized: in their opinion this is already covered (possibly due to the start workshop and eSupported coaching, which has that focus at its core?) The second goal of developing peer coaching by having participants share their examples, is recognized to some extent. However, question 4 on happiness with the degree of peer support received, illustrates the uneven roles and inputs: the two most-contributing participants are the ones least satisfied with the degree of peer support they received. The third design goal regarding advice and encouragement from the group, was highly recognized. As well as the overall added value of the WhatsApp group on top of the other eSupport tools, see evaluation question 5. On the one hand WhatsApp as a medium is ignored less than mails, Apps or Internet dashboard. And on the other hand, the WhatsApp group support gives more continuous encouragement, plus visual inspiration. It is perceived as more open and less hierarchical.

Table 2: User evaluations (5-pnt Likert: strongly disagree (1) - strongly agree (5). >4 = Bold)

User evaluation questions, plus explanations (n=7)	Average (3 = neutral)
1. 'Helped me develop my health identity?' - Two disagree, because already developing health identity. - Three agree, because of continuous reminders it provides.	3.3
2. 'Helped me by sharing our examples?' - Mostly agree, due to inspiration from the diversity of inputs. The photos help.	3.9
3. 'Helped me with group advice plus encouragements?' - (Strongly) agree, due to constant reminders, awareness, encouragements.	**4.4**
4. 'I am glad with the peer support?' - Two disagree, the two advocates giving most inputs: 'more giving than getting'. - Others agree.	3.7
5. 'The WhatsApp group adds value?' - Agree: 'Really different from the eSupported coaching: it gives more continuous encouragement, plus visual inspiration. More open, less hierarchical.' - 'WhatsApp is ignored less than mails, Apps or Internet dashboard.' - 'Potential could be used more: with more start day group interactions and some more coach contributions in the WhatsApp.'	**4.7**

5   Discussion; Implications for Practice and Theory

Firstly, it is nice to conclude that this WhatsApp group pilot generated higher degrees of participation than many other social media settings (often more large-scale and 'feeling' more anonymous like on Youtube) with their 90% passive viewers (Nonnecke 1999, Sun 2014, Khan 2017). This is possibly due to the relatively high 'presence' and 'engagement' attributes of WhatsApp, as reported back by our participants. The three Chinese participants did not contribute much, as also explained regarding Figure 3. We learned that WhatsApp is not available in China, thus it is not a usual (much less an omnipresent) communication channel for them, even when living abroad.

Secondly, combining the quantitative and subjective results from the previous section, we tentatively summarize in Table 3 the WhatsApp group contributions to the three service design goals of the pilot. And given our research question regarding possible affective contributions (in addition to the more utilitarian eSupported coaching), we made this distinction explicit in columns 2 and 3.

For the first design goal of promoting health identity and literacy we found an interesting paradox: even though 1A, 'Showing my best and celebrating', received n=23 inputs, our pilot participants did not perceive clear contributions to developing their health identity. Given their own explanations (see previous section), we conclude that the perceived added value on top of the eSupported coaching was limited for this goal. Maybe the 'showing my best' inputs do hardly contribute to developing a health identity? Plus, we cannot conclude at this point what the subconscious effects are of the positive behaviour reinforcements from these n=23 'celebrations'? Hence the 'Yes?' for 1A in column 2: it is an affective form of group support, but maybe hardly contributing for its service design goal.

For the second service design goal of supporting peer coaching and advocacy, we found that most remarks on healthy diet (2A) and physical activity (2B) had a practical/utility focus. Still some of the inputs were more affective encouragements, hence the '(Some)' in column 2. Unfortunately, regarding 2A and 2B, there is uneven reciprocity: the two most-contributing participants are the ones least satisfied with the degree of peer support they received: they gave more than they got. The other group members were more satisfied with the peer coaching they received. Finally, no mental energy (2C) inputs were shared. This is likely due to at least two reasons: firstly, diet and exercise are 'safer' topics. And secondly, mental energy becomes a more prominent topic in the second month, so the results from those weeks will be interesting to see.

With regard to the third design goal of social support and interactions, both the practical and the affect support examples were amply present, as well as a few examples of humorous inputs. This coincides well with the user evaluations of the attractiveness and added value of the WhatsApp group support.

Table 3: Summary of WhatsApp group support for Service Design Goals (author opinions)

Service Design Goals	Support, Affective?	Support, Utilitarian?
1. Health Identity/Literacy		
A. Showing my best and celebrating progress.	Yes?	
B. Learning to understand how health behaviours work for me.		No
2. Peer Coaching/Advocacy		
A. Healthy diet.	(Some)	Yes
B. Physical activity.	(Some)	Yes
C. Mental energy.		No
3. Social Support Motives		
A. Asking/giving practical support.		Yes
B. Asking/giving affective support.	Yes	
C. Fun and humour.	Yes, some	

Limitations of this study are the small scale (n=11), plus the preliminary nature of the results (week 1 and 2). Usage and contribution patterns can be expected to evolve in the weeks to follow, which we will be keep to analyse in the near future. Given the small scale, we are also not able to correct for cultural differences in the group. Also, theory testing is out of the scope of this explorative study. Finally, the added value that participants perceive, is an added value relative to the existing eSupported health coaching, which makes users' added value perceptions harder to objectify.

A main lesson for practice may be that a WhatsApp group is a low-cost, low-tech, low-threshold way for peer group support, on top of more functional forms of care or coaching. Still, even though the number of coach inputs are modest, it is vital that an expert coach is present in the group, to a) ensure the quality of advice and discussions, b) catalyze group interactions, c) ask certain users for help as health advocates in the group, based on their affinity, and d) ensure that help is always given to participants when they need it.

A lesson for theory might be that the motives we observed for participation were similar to the motives from the Uses and Gratifications framework of social media research (McQuail 2010, Khan 2017), but that the relatively high 'presence' and 'engagement' attributes of WhatsApp, plus the fact that a relatively small scale group setting is used, creates higher degrees of participation and contribution than seen in most social media settings. In terms of the three drivers from persuasive technology (Fogg 2009): firstly, the WhatsApp group provides regular triggers that participants are unlikely to ignore. Secondly, in terms of simplicity: it is very easy to contribute. Sometimes it is even more difficult not to respond (being socially deviant) than to respond, given the social reciprocity in the group. And thirdly, regarding motivators: most uses and gratifications from social media are present (social interaction, giving information, seeking information, self-status seeking and entertainment), as well as affective encouragements and receiving practical suggestions even when not explicitly asking for or seeking information.
Finally, regarding the 'super-survivor' or advocate roles, preliminary results are promising, but more research is needed.

Acknowledgments

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