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“Enjoying health benefits without losing individual autonomy”

Employees' experiences of an app-based health promotion intervention at the workplace – a grounded theory study

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Abstract

Background: The workplace setting is a prioritized arena for health promotion to battle non-communicable diseases. App-based interventions have shown promise to be useful tools for workplace-based health promotion. However, the effects of app-based interventions have been found to be moderate. The aim of this study is to construct a conceptual model explaining how a health promotion app, that is introduced at the workplace setting, is experienced by the employee.

Method: The design used a grounded theory approach as described by Corbin and Strauss. Data from eight in-depth interviews together with memos and field notes constituted the basis for analysis.

Result: The analysis resulted in the core-category *Enjoying health benefits without losing individual autonomy* and eight supporting categories. When employees use a health promotion app at a workplace setting in Sweden, there is a conflict between wanting to enjoy health benefits and not wanting to lose individual autonomy. The conceptual model created illustrates that the experience of the app was heterogenous and influenced by both individual and workplace-related factors. Furthermore, the model was developed to also include three ideal types of experiences: the inspired user, the non-invested user and the forced user. These capture their range and variation of the experiences, in relation to the intended and unintended functions of the intervention.

Conclusion: This thesis shows that when designing and implementing an app-based approach it is important to take care not to threaten individual autonomy of the employees, as that may hinder their ability to enjoy health benefits of the intervention. By considering possible unintended functions, the feeling of threat to autonomy may be limited or avoided.

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Introduction

mHealth and non-communicable diseases

The World Health Organization (WHO) reports that non-communicable diseases (NCDs) are the leading cause of death globally. The NCDs responsible for most death are cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes. Together, NCDs were accountable for 71% of the deaths worldwide in 2016, making NCDs a major health challenge in the world today. Hence, prevention of NCDs is a prioritized goal worldwide (1).

NCDs are complex and often comes with expensive treatment and underlying conditions. This complexity is shown in the voluntary global targets set up by WHO in their global action plan for prevention and control of NCDS. The goals span from increasing physical activity, decreasing salt intake to reducing tobacco usage (2). In Sweden, 90% of all deaths are estimated to be accounted for by NCDs (1). While the numbers of tobacco smokers are on a decrease among Swedes, obesity is increasing among all genders and age groups. Compared to other countries in Europe, there are less of a difference between socio-economic groups, but the difference is still there (3).

Given the large scale and the intricacy of NCDs there is a need to find preventative measures that can reach large numbers of people while keeping the costs down. A more technological world opens for health care efforts that can overcome geographical and temporal barriers, while keeping the costs affordable (4). WHO reports that majority of member states have one or several active mobile health (mHealth) projects. The definition used by WHO is that mHealth include medical and public health practices that are supported by mobile devices. High-income countries report having more mHealth projects operating than low-income countries. These projects range from health call centres to decision support systems. Evaluations of the projects are unfortunately lacking in most cases, creating a barrier to assessing effectiveness and cost-effectiveness. In a Scandinavian, high-income context, the biggest barrier reported was that mHealth was not prioritised (5).

Smartphone application as a tool for health promotion

Smartphones have since their introduction become an integrated part of people's lives and there is a huge number of health-related smartphone applications (apps) available on the market. The apps often target health issues like poor diets, low physical activity, sedentary behaviour or a combination of the three. Health promotion using smartphone software apps show promising possibilities for being effective agents of behaviour change (6). However,

systematic reviews find only moderate efficacy for apps targeting improved diet, increasing physical activity and sedentary behaviour change in both adults and youths (6, 7). Among the three elements mentioned, the increasing of physical activity in adults does have the largest evidence base of effectiveness. However, there are too few high-quality studies with high numbers of participants to be able to draw strong conclusions in this matter (8). A way to increase the effectiveness of the app-based intervention is to combine it with other intervention strategies (6).

For the user, functionality and aesthetics play a key role for choosing an app targeted for personal health. The most popular health apps on the market are assessed having moderate overall quality, but score high in terms of functionality and aesthetics. This indicates that users want a well-designed app that is easy to use and fit the users' purpose. Additionally, interactive features make the users feel more engaged and semi-automatic features make the user feel that it is not a burden to register meals or activities (9).

The workplace as an arena for health promotion efforts

WHO have declared the workplace as a prioritized arena for health promotion. From the company perspective there are both ethical and economic incentives to ensure that the workers have a safe and healthy workplace. Ethical in the sense that a safe and healthy work environment is a human right (10). As NDCs become a more and more stressing concern, targeting risk factors becomes increasingly important for the companies to keep a healthy work force. Furthermore, an unhealthy staff will in the end lead to increased costs and decreased productivity in the form of increasing work-related illnesses and increasing sick absenteeism (10). However, the effectiveness of workplace health promotion interventions is dependent on the target population, the intervention content and methodological quality of the study. A higher effectiveness has been shown for interventions where the target population is young and where there are weekly contacts included in the intervention (11).

The Public Health Agency of Sweden states that more health promotion efforts in the workplace could contribute to a more sustainable work life for employees. Successful health promotion efforts often include an element targeting the organisational structure and/or the physical work environment. Individual counselling, changes in the workplace restaurants, incentives and different types of competitions are all elements that have been part of successful health promotion efforts (12).

Workplace health promotion and technology

As technology develops, so should workplace-based health interventions, especially in high-income countries such as Sweden. Even if app-based health promotion efforts show promise, there is not enough research to create a strong foundation of evidence. The effect of interventions on health-related outcomes vary significantly, spanning from both negative to positive effects (13, 14).

A systematic review from 2019 that focused on wearable activity monitors and smartphone apps at the workplace reports that all the included studies had risks of bias, indicating that a lot of apps used broadly have not been scientifically evaluated. However, the review found mobile health technology at the workplace to be a feasible, acceptable, and effective tool for promoting physical activity. Even so, the long-term impact and the effects on sedentary behaviour remained unclear (15). Although there seems to be positive effects, the effects of the interventions are often moderate and methodological differences reoccur as limitations for both studies looking at physical activity and studies looking at sedentary behaviour (16, 17). A qualitative follow-up study found that the main reasons for signing up to these types of interventions are either a wish to improve one's health or not wanting to miss out on social interactions in the workplace. Furthermore, the active participation is generally low and very few of the participants continuously used the software after the initial phase (18).

The knowledge gap

To fully understand why the effects of app-based health promotion interventions at the workplace are moderate there is a need to understand the experiences of the participating employees. No qualitative studies about this topic in a Swedish setting was found. By further understanding participants experiences, the interventions can be developed to insure more active participation and long-term behaviour changes. This could guide implementors in creating low cost, affordable and effective interventions that there clearly is both an interest and demand for.

Aim

The purpose of this grounded theory study is to construct a conceptual model explaining how a health promotion app, that is introduced at the workplace setting, is experienced by the employee. A health promotion app will be generally defined as a smartphone software application with the purpose of promoting healthy habits.

The overall research question is “*What does it mean for employees when a health promotion app is introduced in their workplace setting?*”

The sub-questions include:

- How do employees experience using the app at different phases of the intervention?
- How is the economic incentives involved seen by the employee?
- How do employees see the relation between using the app, their health-related behaviours and their work situation?

Methods

Research design

As the aim of this thesis was focused on personal experiences, qualitative methodology was used. Personal experience is multifaceted, and there is no way to know beforehand what is unknown. Hence, there is a need for an emergent design which is a cornerstone in qualitative research (19). As the introduction show, there is a knowledge gap surrounding employees’ experiences of using health promotion apps in a Swedish workplace setting which makes qualitative methodology appropriate. Furthermore, when aiming to grasp the subjective reality of experiencing the phenomenon it impossible to start out with a well-defined hypothesis, you need to talk to participants. Qualitative researchers must work in a circle where developing a working hypothesis comes after identifying the problem, collecting, and analysing data. If saturation is not reached for creating a working hypothesis the researcher must re-start to identify the problem and collect more data (19).

Grounded theory (GT) was chosen as the most suitable qualitative methodology to reach the aim of the study. Creswell and Poth suggest a that grounded theory is suited for studies that aim to explain or understand processes and when there are no theories available on the phenomena being studied (20). Notable is that even if a general theory is available, grounded theory is useful to develop theories for a specific target group, context or in cases where the theory is incomplete in some aspect (19, 20). As the aim of this study both include explaining a process and the construction of a theoretical model, GT was seen as a suitable choice.

Setting

The study was conducted at a costumer owned insurance company with banking services in the south of Sweden. The main office is situated in the capital of the corresponding county, and five other regional offices are located in the other municipalities of the county. In 2019

the company had over 100'000 policyholders and around 160 employees. The majority of the employees are covered by a healthcare insurance that includes healthcare advising, counselling and health promotions services. In 2019 a new effort towards a sustainable work life was introduced. In the company's sustainability report it is stated that the goal for the new efforts was to increase the physical and mental wellbeing for the employees both long- and short term. In March 2019, a mobile health promotion application was implemented as a part of this health promotion effort. The employees can discontinue the usage of the app if they want. The company reports that most of the employees register activity in the app regularly. Furthermore, there is an economic incentive paid out to all employees from the company if the employees collectively register a set number of activities during the year. In this paper this will be referred to as the goal-related payment.

The health promotion application used

The health promotion app used is designed so that every team register health related activities in order to move the team forward at a virtual game board. When as many activities as the team has members have been registered the team takes one step forward on the board. Only 30 minutes of activity can be registered per day with the intent that all team members can contribute and not only those who already have a very active lifestyle. The activities range from physical activities to mindfulness and social activities. Each month has a different health-related theme and there are weakly bonus challenges so the teams can score extra points. The app is developed by a company that specialises on gamification. The registration of activity can only be done day by day and closes at midnight. The insurance company is okay with personal registering on the next day if they forget.

Sampling

With the help of gatekeepers at the company, an invitation to participate in an interview was sent out on the intra-web available to all employees. The aim was to sample for maximum variation, followed by theoretical sampling in order to reach saturation of the categories. Theoretical sampling is sampling based on the concepts that appear to be relevant to the evolving storyline (21). Hence, efforts were made to reach participants from several different local offices, both men and women, and persons with different levels of physical activity. Theoretical sampling was introduced after the preliminary analysis of the first four interviews to reach more experiences from men and from persons with lower activity levels. However, saturation was deemed unlikely given the narrow timeframe of the thesis work.

When performing qualitative studies, it is important that the participants included have an insight or have participated in the phenomenon being studied (20). Hence, the inclusion criteria for this study was that the participants had used the health promotion app. Six of the participants reached out after reading the invitation on the intra-web while two were later theoretically sampled. In line with the short timeframe and the covid-19 outbreak, the sampling of participants stopped after having reached and interviewed eight informants.

Data collection

In-dept interviews, supported by a semi-structured interview guide was the primary data collection method. The eight interviews were conducted in February and March of 2020. The author of this thesis (ME) was the interviewer in all interviews. Individual interviews were chosen as they are regarded suitable for GT studies (22). The first seven interviews were conducted at the local offices of each participant. In total, four out of six local offices were represented. Due to the covid-19 outbreak the last interview was conducted digitally by using a software commonly used by the company. The participant connected only with audio due to lack of web cameras at the office and the interviewer connected with audio and video. The interviews ranged between 24 and 44 minutes, with an average of 38 minutes. Moreover, the interviews were digitally recorded after informed consent had been given by the participants (19, 22).

The interview guide was developed into a mind-map. Both the mind-map and the full interview guide was used during the interview (see Appendix 1 and 2). The purpose of the mind-map was to help give flexibility and the best conditions for open questions and probing opportunities (22). The full interview guide, with suggested questions, was used as a security to make sure no important question were forgotten. Both the interview guide and the mind-map were altered in line with an emergent design as the project progressed (21). The main topics of the interviews included experiences of being introduced to the app, experiences of using the app, perceptions about the goal related payment and the current work situation, example of behavioural changes and thoughts about the future. Furthermore, memos and fieldnotes supported the interviews. Being true to the emergent design of grounded theory, the results from the first interviews guided the following interviews (21). In addition, substantive, methodological, and analytic notes were written after each interview (23).

The interviews were transcribed verbatim. Due to the relative short timeframe, the participants were not given the option to receive the transcription from their interview as the

time for feedback was deemed insufficient (21, 22). However, the participants were encouraged to contact the interviewer for clarifications or questions any time after the interview, as one participant did.

Analytic approach

After transcription, the data was analysed using grounded theory based on how it is described by Corbin and Strauss (19-22). The coding consists of three main phases. Depending on literature, the types of coding have slightly different names. In this thesis the phrases open coding, selective coding and axial coding will be used, in line with the Corbin and Strauss approach (21).

The purpose of open coding is to open up the text in order to highlight important information. This was done by going through the transcripts line by line, and continuously coding the information (19, 21). The open coding was facilitated using the software *OpenCode*. The next step in the coding process was selective coding. This refers to process of deciding which codes are important, cluster these important codes and turn them into sub-categories and categories (19, 21). The selective coding was assisted by using the code lists from *OpenCode* which was then clustered in *Office Word*. When the categories were formed, the transcripts were revisited to examine properties and dimensions related to the category to further develop the sub-categories. Table 1 illustrates the coding process of the original text as well as properties and dimension for the category *Losing actuality over time*.

(Insert table 1)

The last step of the coding was axial coding. For the axial coding, the categories were printed and laid out on a table in order to visualise the potential axes and correlations between the categories and their subcategories. The core-category was developed by choosing the category with the greatest explanatory power, that also could link other categories to it and hence illustrate the overarching explanatory concept (21). Three ideal types were developed alongside the categories and subcategories, forming the basis for the axes and for constructing concepts and hypotheses to be included in the theoretical model (19, 21).

The ideal types provided an analytic lens under which the participants experiences could be examined (24). It is important to keep in consideration that the ideal types are theoretical and do not represent specific participants. Rather, they help the researcher manage the empirical reality by comparing it to the ideal type. This comparison can be used as the basis to make new discoveries, making it a good match to both GT and the aim of this thesis (24).

In all steps of the analysis, constant comparison was used moving between the interviews and the memos made during both the interviews and the analytic process. All parts of the analysis were conducted in Swedish. The results were then translated to English and small grammatical corrections were made to the quotes.

Ethical considerations

For all studies, there are ethical considerations to be made. For this study, the most noteworthy considerations are connected to confidentiality and informed consent. Both aspects are founded primarily in the basic ethical principle of autonomy. This principle states that the participants have the right to decide their own actions and that society, and in this case specifically the researcher, must respect this right (19).

Informed consent means that the participant must not only give consent to participate, they must also understand what they are saying yes to (22). Hence, the researcher must convey the overall purpose of the study. Furthermore, information about who will have access to the information, what the information will be used for and the matters of confidentiality should be conveyed to the participant before they are able to give informed consent. This process is referred to as briefing and debriefing by Brinkmann & Kvale (22).

For this study, the briefing started with the participants reading the combined invitation- and information letter sent out (see Appendix 3). If the participants had not had the time to read the letter in beforehand, they got a chance to do it before the interview started. After the participants had read the letter there was a discussion about the contents and a chance to ask question. The participants were then asked if they wanted to take part in the interview and if they consented to the interview being recorded. When the recording started the participant got the same question again in order to get the consent recorded. Recorded verbal consent was chosen to avoid having papers with names and signatures to store and lessening the risk of breaching confidentiality (22). The participant also got information on how the information would be used and that no information that could identify the participants would be used when presenting the results. An ethical consideration that was not foreseen was that the interviewer needed to announce who she was meeting with at the front desk. Since the study did not address a sensitive topic this was deemed acceptable, but it made it even more important that no identification can be made from the material. In the report, the company and the name of the app was hence anonymised. Furthermore, all recordings were deleted as soon as the transcription process was finished. The study was approved by the thesis supervisor at

Lund University before any interviews took place. As the project proceeded, a continuous dialogue regarding ethical consideration was held with the supervisor.

Results

Characteristics of participants

The ages of the eight participants ranged from 30-60 years. Six out of eight participants were women. The average time employed at the company was nine years. Most of the participants considered themselves living an active lifestyle. All participant expressed the importance of health and a healthy lifestyle and had used the health promotion app.

Description of results

Enjoying health benefits without losing individual autonomy

The analysis resulted in the core-category “Enjoying health benefits without losing individual autonomy”. This core-category illustrates that when employees’ are introduced to a health promotion app at the workplace there is a component of feeling forced that risk threatening their autonomy, but also a possibility for being strengthened by the intervention and able to enjoy the potential health benefits. The conceptual model depicts that the experiences of the app are heterogenous, but also that there is a clear gradient in experiences, ranging from the feeling of being strengthened to the feeling of being forced, see figure 1. Employees experiences are influenced by both factors that relate to the individual employee, but also factors related to the workplace. The categories are seen as properties of the core-category, deepening the understanding of the experiences of the app itself, the demands and opportunities of the intervention, and the role the employer plays. The sub-categories, illustrating the dimensions of the categories, are then used for forming ideal types that indicate three possible ways of relating to the intervention. **The inspired user** is characterized by seeing the app as a tool and opportunity to reach personal health goals. The intervention is seen as a benefit, and the energy and time spent feels well-invested. The inspired user is only to a low extent affected by the app losing actuality over time, keeping the eye on the health goal. **The non-invested user** sees no benefit from the intervention but put in limited time and energy towards the intervention. The non-invested user already has a health behaviour that they are satisfied with and see no need for change. **The forced user** feels that the intervention directly threatens their individual autonomy. The wish to reach personal health goals is overshadowed by the feeling of being surveyed and forced by the employer. The intervention

is experienced as mandatory and creates stress. The forced user is greatly affected by the app losing actuality over time.

(Insert figure 1 here)

Below follows a more detailed description of the material with the categories as headings and the supporting subcategories indicated in italic. The ideal types are indicated in bold and quotes are used to show how the interpretation is based on the data.

Constituting a potential agent of change

This category refers to the app's ability to be a tool for behaviour change. The sub-category *the app inspires me* mainly represents **the inspired user** that saw the intervention as a possibility for behaviour change, and that the app was a motivation to make changes.

“[For me, the app] is when you think that you only will sit in the couch the whole evening and then the phone buzzes and you instead think that ‘I can take a 30 minute walk, that’s fine’” (I-7)

The non-invested user is more linked to *I do not need the app* which indicates that they already had a routine for their exercise and their health-related lifestyle. Hence, the app was deemed meaningless and only something to be used because the employer asks it.

Furthermore, **the forced user** would be more connected to the notion that *the app makes no difference* and that using it was not in any part connected to behaviour change, even if this experience was not exclusive for this ideal type.

“I would not have exercised more or less if we did not have it [the app]. So, for me, it makes no difference” (I-5)

Wanting time and energy

Using the app demanded, to varying degree, time and energy from the participants. As the app wanted time and energy of the users, its introduction created a situation where the employees had to relate to a new tool in the workplace that demanded their attention. **The inspired user** is primarily associated with the sub-category *the app is a good reminder*. This sub-category describes how the app made it possible to be aware of behaviours, was a help to get off the couch, and generally seen as a helpful tool. Hence, the energy that was spent on the app was deemed minimal and was a good investment for the participants health.

“I was active before [the app] as well. But it’s these other activities we have gotten from the app, I’ve become more aware of other parts of health [compared to only exercise]./.../ I feel better and then I perform better for the company as well.” (I-3)

The non-invested user is more represented by the notion that the app does not contribute much, that the energy input deemed minimal and hence not worth taking note on. The feeling that *the app is meaningless* is connected to this ideal type, describing how the app does not really matter, because it did not change the employee’s life anyway.

“It is not a burden, it is nothing” (I-5)

The forced user is more connected to the sub-category *the app stresses me out*. Elements that contribute to this subcategory is that the app demands energy every day, and the act of forgetting to register. Forgetting to register makes the employee feel guilty as they see themselves as hindering the team’s progress. On the other hand, **the forced user** is also linked to feeling that the act of motivating one’s team is stressful, especially if the team did not respond with enthusiasm.

“It’s not that I’ve heard from the team that ‘we are bad, we are falling behind’ but it is in the walls in some way like ‘why was it not registered?’ or ‘why was this not done?’” (I-6)

Losing actuality over time

This category describes how the app has a tendency of losing actuality over time which is connected to all ideal types. The engagement of the personnel was big in the beginning: having active discussions, high competitiveness in the teams and a desire to register many activities. It was *easy to be invested in the beginning*. To some extent, *the app is a part of the new normal* which made it less noticeable over time, blending in with the rest of everyday life.

“It was more in the beginning. Now there are not so many discussions about the app at all. But in the beginning, it was a hot topic, the competitive spirit you know.../” (I-1)

As time went by, the participants felt that fewer discussion about the app surfaced, and less information and updates was sent out by the employer. This made the participant feel less motivated, and they were *putting in less effort over time*, while they started to look forward to a possible end-date for the project.

“My team is a bit hard to motivate. Last week, half of the team was sick or on vacation, so I emailed the others that now we have to step up and register at least one point per day, and cover for the others. No one responded./.../ it feels like a long time that we are supposed to use it [the app] the rest of the year” (I-2)

The category is mirrored in the ideal types in relation to the extent which the app lost actuality. The more vulnerable, the more likely the ideal type is to stop using the app. **The inspired user** is only affected to a low extent, keeping the eyes on the goal of the personal health benefits. **The non-invested user** represents the notion that the project had a very low actuality all through the timeline, not showing neither an increase nor a decrease. **The forced user** is more sensitive to the intervention losing actuality over time.

“You feel a certain pressure to register this. At the same time, I think it has blown over, that it is not the same stress that was present in the beginning. You have started to feel that it doesn't matter” (I-4)

Being a non-dynamic tool

The app itself was described as a non-dynamic tool. **The inspired user** is to a large extent linked to the sub-category *the app is easy to understand*, making the learning process short and time efficient. Hence, being more forgiving for the non-dynamic design. **The non-invested use** is instead more connected to the notion that the very simplistic design was experienced as *the app is inflexible*. **The forced user** mostly find that *the app is frustrating* and connects stress and frustration to the design. A thorn to the side, connected to both the inflexibility and the frustration, was the fact that activities can only be registered day by day, with a closing time at midnight.

“I think it's so static. That it's so controlled. Like, you must do it every day. If it would have been more freedom in it, I think that it would have felt better” (I-3)

All ideal types share similar experiences of the weekly and monthly challenges in the app. Some challenges mentioned was “reduce food waste”, “try a new activity” and varying physical activities done as a group. The challenges were perceived as providing variation to the app, *challenges create variation*, but were also seen as problematic due to the fact the many challenges were perceived as meaningless and not developed enough: *the challenges are not thought through*. Together, all ideal types are more or less related to *a wish for a more dynamic tool* with personalized, more dynamic feedback as well as a more varied information content.

Creating a demand for usage at home

This category is very polarised and describes that the app is connected to activities done in leisure time and hence to the experience of being demanded to use a tool connected to the workplace outside workhours. **The forced user** is mainly informed by the sub-category *being forced to working in leisure time*, which includes the conviction that the employer has no right to control the leisure time and the feeling that the intervention is an intrusion. This feeling of the autonomy being threatened were strengthened by the feeling that the project was compulsory.

Now they do not just control me at work, they control my free time as well” (I-2)

On the other hand, **the inspired user** is more connected to the feeling of *getting paid to exercise* and seeing the demand more as a privilege. This demonstrates very positive feelings towards the intervention and the experience of high individual autonomy.

“Actually, we get paid to exercise on our free time, and that is a strong way to show that you care as an employer. And it’s super easy, just registering something for fun.” (I-8)

Not all employees have a strong emotional reaction to this aspect, which is linked to **the non-invested user**. This ideal type connects more to the notion that employees are simply *doing what is expected of me*, not connecting emotionally with either compulsory elements or any true satisfaction, rather just being content with pulling their own weight in the project.

Encouraging connectedness to the team

Being part of a good team was closely connected to the experience of being successful in using the app and that the app was encouraging connectedness to the team. The category is mirrored in **the inspired user** as the app was a way to create a *closer connection with my co-workers* by sharing photos and motivating messages in the app. This contributed to the feeling that *my team pushes me to success*, which also supports the ideal type. By friendly reminders from co-workers, a will to please the team and enjoyment of doing challenges together, the team motivates the participant to put more time and energy into activities connected to the app.

“I like to follow my co-workers at home, get to know them on a different level. That is the best thing about this [the app], to see what others do” (I-6)

The non-invested user is instead mainly connected to the sub-category *my team does not matter to me*, describing the team as a non-essential part of the experience. *My team weigh me down* is linked to **the forced user** and describes that this encouragement of connectedness can be a burden if one is not getting any help or support from the team. Instead, some participants must put a lot of energy into trying to motivate the team or simply register and be content with being the one that registers the most in the team.

“/... I wish there were others in the team that were super-enthusiastic but since I’m the one contributing the most, I don’t feel that way.” (I-1)

Having double-edged economic benefits

The usage of an economic incentive was described as a driving force for continuing to register in the app during the project. This category describes that the economic incentives could be seen as both positive and negative. The category is reflected in **the inspired user** mainly by the sub-category *the goal pushes me forward*. When the registration felt boring or tedious, the employee felt like it was worth it because there would be a reward in the end.

“I think it’s very good that we can contribute to everybody getting a little bit active and maybe healthier. And then there might be others like me that can get that little kick in the behind that gets us started” (I-7)

Furthermore, the economic incentive was also seen as a main factor making the project feel mandatory. This is reflected mainly in **the forced user** supported by the sub-category *I cannot say no*. This sub-category describes how the usage of the app was experienced as mandatory by the company, as well as by social factors as not wanting co-workers pull to their weight nor wanting to be the reason for co-workers to miss out the goal-related payment.

“It [the app] is nothing you say yes or no to, it was something that you had to do. Because it’s connected to the goal-related payment and that is connected to the whole company.” (I-4)

A strategy to deal with the threat to autonomy was to reason that the goal was for the entire group and not focused on the individual actions. Not everybody had reflected actively about the economic incentive during the project. This was expressed rather neutrally in **the non-invested user** and is connected more to the sub-category *I have not reflected over the economic incentive*. With no strong positive or negative emotion, no deeper reflection was done about the economic incentive.

Remaining in the hands of the employer

The level of support felt from the employer and the opinion about the employer's role differs among the participants. This category describes how the app remains in the control of the employer while it is being used by employees. **The inspired user** is mainly linked to *my employer cares for my health* and experiences of the intervention as a way for the employer to take care of the staff and for the staff to feel a personally connected to the employer.

"...you feel like the company does not want to control my exercise but instead it is voluntary to participate and they [the company] care enough about the staff to point out that this is something that they look positively on and that actually leads up to a win-win situation" (I-8)

The forced user represents the feeling that *my employer surveys me*, which strongly related to autonomy being threatened and it is not the employer's business what they do in their free time, nor how they eat or exercise.

"We talked about it as late as yesterday, why we are supposed to do this in our free time. How much I exercise is not the employer's business. So that discussion has been up multiple times" (I-1)

The non-invested user is mainly linked to those that distance themselves further from the employer. Seeing that *my employer has their own agenda* and not feeling a personal connection but rather that the company only did the intervention to reduce its cost connected to unhealthy staff.

Discussion

Overview of findings

The aim of this study was to develop a conceptual model explaining the employees experience of using a health promotion app in a workplace setting. The experience turns out to be greatly diverse, as shown in the conceptual model. The core-category, enjoying health benefits without losing individual autonomy, is linked to several categories that are properties of the core-category. All included categories show a gradient in experiencing how the employees want to, and do, enjoy the health benefits of the health promotion effort, but do not want to lose their individual autonomy doing so. In addition, the analysis led to the construction of three ideal types were constructed based on the categories: **the inspired user**, **the non-invested user** and **the forced user**, that together with the conceptual model will form

the basis of the discussion of the results, both in relation to manifest and latent functions, and existing literature.

Manifest and latent functions of the social action taken

The American sociologist Robert Merton developed a theory in the 1940's on the functions of all social actions, which is relevant also to public health interventions today (25). Merton states that all social action have manifest and latent functions, resulting in both intended and unintended consequences (26). For public health, this is important because it stresses the concern that all interventions should be evaluated not only for the intended, but also for the unintended consequences. These evaluations can then lead to a development or modification of programs (25). For this study, the theory can be applied to the act of introducing a health promotion app in a workplace setting, which then will have both intended (manifest) and unintended (latent) consequences. According to Merton, the intended consequences or outcomes are always planned to be favourable for the actor, but not necessarily to those exposed to the action/intervention. Moreover, just because a consequence is unintended, it does not mean that it is undesirable (26). If we look at the manifest intended function of introducing a health promotion app, we find that the company states that the purpose with the projects is to:

- 1) Increase physical and mental wellbeing among employees' short term
- 2) Increase physical and mental wellbeing among employees' long term

The long-term effects are out of the scope of this study, but it is possible to discuss and hypothesize on the short-term influence on physical and mental wellbeing.

Manifest and latent functions of the workplace app intervention

Public health interventions need to be evaluated both for their intended and unintended consequences (25). As states above, these unintended consequences should be looked at in relation to the set goals of the intervention. The unintended consequences can however be both desirable and undesirable, and are simply characterized by not being intended by the actor (26).

In this study, **the inspired user** represents experiences and views where the app is seen as a tool and opportunity to reach personal health goals. It is not farfetched to say that for this ideal type, the app has the potential for acting as an agent of change and increase physical and mental well-being. **The inspired user** sees the intervention as a benefit and see all energy put

into the project as well-invested. As a consequence, participants attached to this ideal type are more likely to put energy into changing their behaviour to a healthier one by changing health-related behaviours. Hence, the intended consequences of the intervention are met to a large extent.

The non-invested user represents the view of the app not making any difference and where no need to change any behaviour is felt. This implies that for those participants characterized by these views, the introduction of the app did not meet the company's intended aims.

However, they did not seem to be bothered by with the negative, unforeseen consequences of feeling that the app was a threat to their individual autonomy. Those that are represented in **the non-invested user** instead position themselves by not being much influenced, neither by the positive benefits or the negative consequences.

The forced user represents the notion of the app constituting a potential threat to individual autonomy, where there is a risk that physical and mental wellbeing will not improve, but instead could be decreased due to feelings of stress and frustration. This is definitely not in line with the intended consequences of the intervention but could be categorised as an undesirable, unintended consequence that needs to be taken into consideration when the intervention is evaluated.

The most important negative unintended function found in this study was the experience of feeling forced, and the negative emotions connected to this, represented mainly by **the forced user**. The feeling of being forced to take work home at the end of the day, having to work during leisure time, and the employer interfering in the free time are all negative, unintended consequences that would need to be addressed. The economic incentive played an important role in why employees experienced the health promotion app as mandatory. While being an intended driving force for the participants to keep registering during the project, the economic incentive also created a situation where some employees experienced the health promotion app as mandatory. Monetary incentives are becoming more and more common in health promotion efforts in workplace settings (27). Noteworthy is, as shown in this thesis, that monetary incentives can have negative consequences for the participating employee. When the intervention shifts from being experienced as voluntary to mandatory, the employee is at risk for negative health outcomes, such as stress, and feeling that individual autonomy is threatened. The feeling of having to work during leisure time is closely connected to the economic incentive since employees may feel that it is needed to receive work-related payments. However, the usage of economic incentives cannot be ignored or rejected. There is

evidence that economic incentives can increase participation in workplace health programs (28). What has become clear in this study is that it is important to evaluate the economic incentives for unintended, negative functions.

The workplace-related category “remaining in the hands of the employer” includes both positive and negative aspects of the intervention. While it is of great advantage for the company to know that there were employees that expressed trust and a feeling of being cared for, it is of great importance to also be aware that others felt surveyed and controlled. This is an aspect that highlights the experiences of the app being a potential threat to individual autonomy for **the forced user**.

An unintended, positive consequences connected to **the inspired user** is the opportunity that arises to use the app as a small social media to get to know teammates better. This can be linked to a positive unintended function supporting the manifest function to increase mental well-being, since it opens for co-workers to be more prone to socialise outside the workplace setting. Women may benefit especially when there are elements of social support integrated in the health promotion intervention (29).

Another unintended and unexpected consequence was that the app, that generally was perceived as easy to use, also could be experienced as rigid and inflexible. The semi-automatic features that make users feel that it is easy to register own data are generally sought after (9). However, in this case it seems like the simplicity of design can cause the app to be experienced as inflexible, especially after an extended period of usage. **The inspired user** is again more forgiving toward this feature, while **the forced** and **the non-invested users** experiences more frustration.

It is tempting to look at the ideal types and state that **the inspired user** represents the healthiest among the employees. However, it may be more correct to say that this is the ideal type that benefitted most from the intervention by actively trying to change everyday life to include more healthy habits. **The non-invested user** is characterized by already being satisfied by their health behaviour and not seeing a need for change. Nonetheless, being satisfied with the health behaviour is not the same thing as objectively not needing to change to be healthier. For **the forced user**, the wish to change unhealthy habit are overshadowed by the experience of threatened autonomy, saying nothing of the activity level for this ideal type before or after the intervention. All three ideal types could have the same activity level, but still experience the health promotion app intervention differently.

Existing literature and future strategies for sustainable health promotion

When looking at the existing literature, it is apparent that there is a lot of information about health promotion in a workplace setting. There are meta-analyses on effectiveness as well as systematic literature reviews focusing on specific target populations and intervention designs (11, 30, 31). It is also known that large companies more often have health promotion programs in place compared to small companies (32). Employers in small companies are often more reluctant to feel that they are “meddling” in the employees’ personal lives when promoting health programs (32). Furthermore, employers in a qualitative, phenomenological study in Australia reported that employers felt that it was possible for employees to both be effective workers while making unhealthy lifestyle choices (33). When looking specifically at app-based approaches, the information is sparser. Many of the reports found are neither scientific nor reviewed. However, a closer comparison of this study to the relevant findings will be presented below.

While not being an app-based intervention, a qualitative content analysis study about a health promoting effort for women in a Swedish municipality highlights the importance of a holistic perspective, where the workplace and the private life both are crucial in order to improve health-related knowledge and awareness. The study focused on how working women experienced the health program in relation to work life balance and wellbeing. The success was partly attributed to the element where the women could reflect about their inner resources which then opened up for behavioural change (34). This wish for a dynamic tool is echoed in the category that describes the app as *being a non-dynamic tool*. In developing the health app project further, it may therefore be beneficial to include more elements of self-analysis.

Experiences from a qualitative follow-up study of a web- and app-based health promotion intervention in a Danish workplace setting, state that participants signed up to the intervention mainly to improve their health and to not miss out on social events (18). Furthermore, a systematic review of the determinants of participation in health promotion programs in a workplace setting states that interventions with higher participation levels include incentives, have a multi-component strategy, and focuses not only on physical activity but on multiple health-related behaviours (35). In contrast, this thesis found economic incentives to be double edged as a measure to increase participation. However, since most participants took part in the intervention based on feelings of obligation the results are hard to compare.

The Danish study and the systematic review of the determinants of participation mentioned above reported that the projects had low levels of active participation, most users during the initial phase, and more female than male participants (18, 35). This supports the results from this thesis since the app-based intervention was experienced as *losing actuality over time*. This could also explain why more women than men participated in the interviews of this thesis.

The findings of this thesis mirror other studies suggesting that health promotions apps are promising for workplace health promotion (6, 13). However, this thesis also clarifies that there is a need to further develop the apps in order to have a successful health promotion instrument. The functionality of apps for a workplace setting might demand more focus on information quality and variation than other popular health promotion apps in order to keep them up-to-date over a longer period of time (9).

The results from this thesis illustrates that the threat to individual autonomy can be hindering enjoyment of the potential health benefits. Hence, the groundwork for getting more **inspired users** instead of **forced users** starts with making sure employees' autonomy is not threatened. A qualitative content analysis study, exploring several stakeholders' views of workplace health promotion, shows that both employers and employees put great emphasis on employee's own responsibility, but interpret responsibility differently. To employees, responsibility is autonomy, meaning that they feel like their lifestyle is their own responsibility and that they should not need to justify it to the employer. To the employer, responsibility is duty, meaning that the employee has a responsibility for their own lifestyle and can be held accountable for it (36). These conflicting views can result in communication problems, which could be a reason for employees in this thesis feeling like their autonomy is threatened. The sub-category *My employer surveys me* indicates that the employee may feel like the employer demands justification for performing certain activities and holds the employee accountable, and ties closely to the feeling of being forced, both as shown in the sub-categories *Being forced to work in leisure time* and *I cannot say no*.

As shown, app-based interventions have a lot of the same challenges for stakeholders as other mediums of workplace-based health promotion intervention (36). Furthermore, giving employees a clear voice when developing and implementing such interventions could be a way to decrease the miscommunication regarding responsibility/duty and decreasing the feeling of threatened individual autonomy (35-37).

Methodological considerations

A strength of this study is the grounded theory approach that aims at developing a conceptual model to contribute to a more abstract explanation of a phenomenon, in this case the introduction of a workplace health promotion app (21).

A methodological consideration that must be discussed is the level of saturation reached for the categories developed. This is connected to the outcome of the purposive- and theoretical sampling (21). Looking at the included participants, we see that many of the participants already had an active lifestyle. Some theoretical sampling was performed to reach persons with a less active lifestyle and include more experiences from male participants. Even if there is variation in the sample, there would be a need to find more variation in the activity levels to make sure that saturation is achieved. Furthermore, the level of saturation varies between different categories. The core-category may be deemed saturated in that an extension of the study would mainly serve to strengthen the trustworthiness of different properties of the core-category.

A second methodological consideration is the construction of the ideal types. When an ideal type is constructed in a correct way, it can help the researcher productively study a new topic, making new discoveries (24). Swedberg discusses Weber's ideal types and presents four elements of the ideal type that must be considered: The ideal type acts in a rational way, the ideal type has complete information, the ideal type is aware of what it is doing, and the ideal type does not make mistakes (24). After considering these four elements, the empirically constructed ideal types of this thesis were deemed to be constructed in an acceptable, adequate way.

When looking at manifest and latent functions there are two main methodological pit falls. Firstly, the researcher must consider if the consequences described can be attributed to the action described (26). In this case, the results are so closely connected to the usage of the app that it can be justified that it is attributed to the action of implementing the app. Secondly, the researcher must know the actual purpose of the described action. This uncertainty is reduced when the action is taken by an organized group since it most often demands some kind of statement of goals (26). For this thesis, the purpose that was described was taken from the company's sustainability report. This does not exclude the possibility of other parallel purposes. Team building, creating a climate where everybody has a common ground to talk about health could all be parallel purposes, even if they were not mentioned in the report.

Finally, it is important to consider the measures taken to strengthen the trustworthiness of the thesis. Credibility refers to how well the study have captured, understood and reconstructed the multiple realities of the included participants (19). Peer-debriefing was conducted throughout the study in the form of regular meetings with the supervisor to discuss the interpretation. Crucial inputs came out of these meetings, which strengthened the credibility of the results. Member checking was not conducted as the author deemed the timeline to narrow. In hindsight, member checking might have been beneficial.

A consideration for the level of thick description presented for this study, affecting the transferability, is the risk of the participants being recognized (19). In this study, the importance of keeping the informants anonymous meant that the amount of information that could be shared was limited. With a very specific setting it was deemed the most ethical choice, but of course this has implications for the applicability of the results to other settings.

Excessive note keeping and providing examples of the analysis were the main efforts taken to control for dependability. Furthermore, the note keeping also strengthens the neutrality claim of the result which is more important than researcher neutrality for assessing the confirmability of qualitative studies (19).

Conclusion and implications for practice

This thesis shows that designing and implementing an app-based health promotion intervention at a workplace is a complex venture that needs to consider both intended and unintended functions. The three ideal types illustrate how employees may relate differently to an intervention, and that there can be a conflict between enjoying health benefits and threats to autonomy. If participants feel forced, surveyed, that the design of the incentives are unreasonable and that their individual autonomy is being threatened, this may hinder their possibilities for enjoying the health benefits. On the other hand, if they feel engaged, socially rewarded, reasonably incentivised and see the intervention as a sign of employer's concern for their health, their possibilities for maintaining or improving their health may increase.

In order to create sustainable app-based health promotion interventions in workplaces it is particularly important to minimize potential unintended negative consequences, especially related to threats to autonomy, but also to maximize consequences that are not directly targeted but could increase the possibilities for the employees to improve their health and increase participation. The untargeted but important consequences could include participants influence over the design, clear communication regarding the usage of the app in relation to

economic incentives and use outside of workhours. Furthermore, when introducing an app-based health intervention, it is important to keep it up-to date, relevant and applicable to the employee for the intervention to keep actuality over time.

Acknowledgement

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Tables and Figures

Table 1. Example of the coding process for the category *Losing actuality over time*.

Text	Code	Category	Properties	Dimensions
<p>“You feel a certain pressure to register this. At the same time, I think it has blown over, that it is not the same stress that was present in the beginning. You have started to feel that it doesn’t matter”</p>	Feeling pressure in the beginning	Losing actuality over time	Level of energy demanded by the app	Using the app is easy - Using the app takes a lot of energy
	Feeling that the app does not matter any more		Level of motivation for using the app	High motivation in the beginning - Low motivation as time progresses
<p>“It was more in the beginning. Now there are not so many discussions about the app at all. But in the beginning, it was a hot topic that you should, the competitive spirit you know.../”</p>	Discussing the app more in the beginning		Intensity of discussing the app	Active discussion with co-workers - No mention of the app
	Not discussing the app any more		Level of urgency to win the competition	Wanting to win - Not caring which team wins
<p>“I don’t know why you forget about it, because it is no big deal to do. There is not that much information about it sent internally in the company anymore maybe”</p>	Getting less reminders from the company		Regularity in getting informed	Getting updates often - getting few updates
	Losing motivation to use the app		Level of motivations among participants	High motivation to use the app - Seeing the app as useless

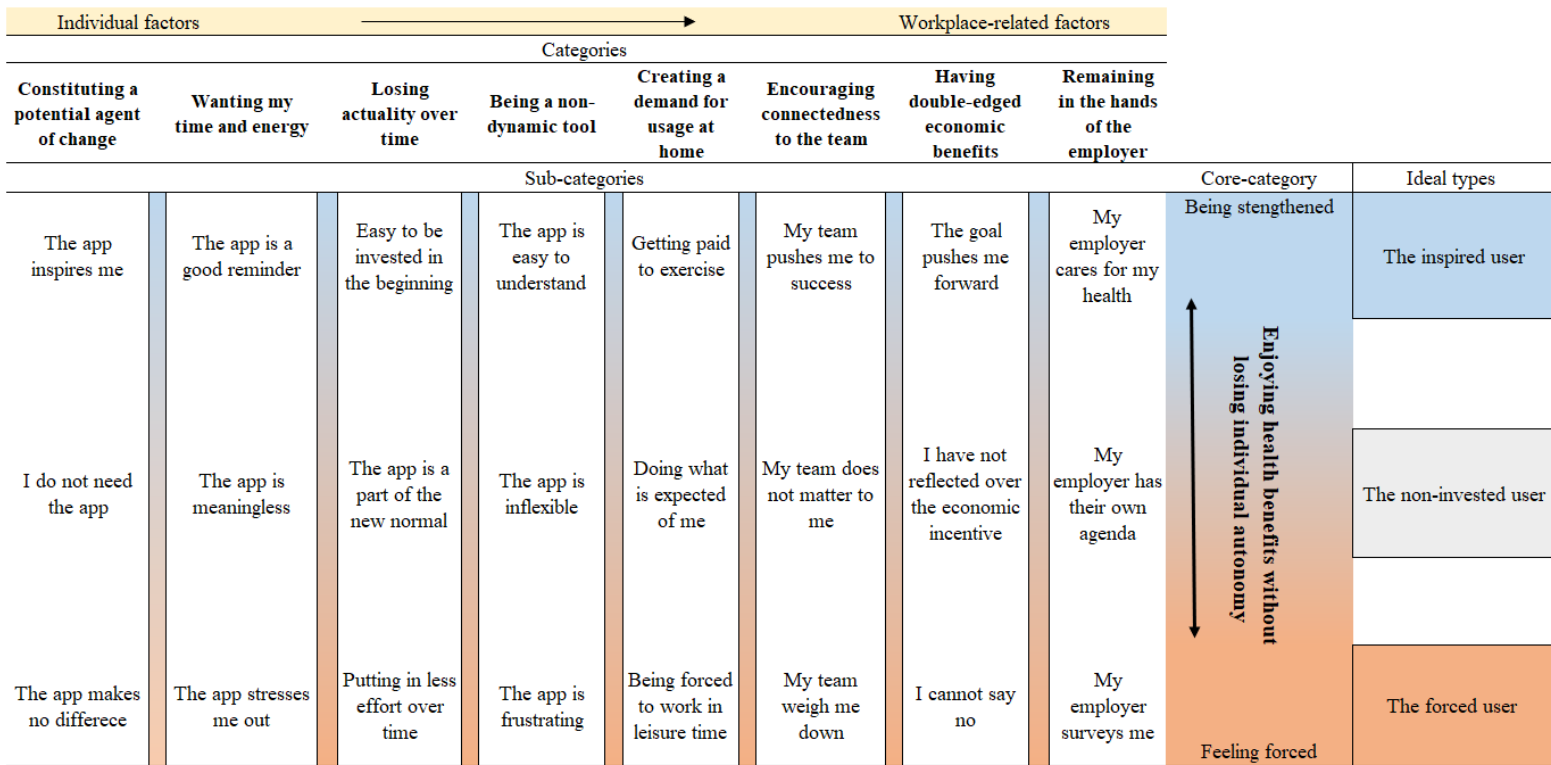


Figure 1. A conceptual model explaining the experience of using a health promotion app in a workplace setting, in Sweden.

Appendix

Appendix 1 - Interview guide

Start

Walkthrough of the interview, the information letter and purpose

Any questions?

Start the recording and ask for consent

(Now that you have received additional information, do you still want to participate in the interview?)

Background

-Tell me about yourself

-How long have you worked at the company?

-What do you work with?

Being introduced to the app

-If you were to describe the app to someone that have never heard of it, what would you say?

-When did you hear about the app for the first time?

-Can you describe how it was?

-What did you think in the moment?

-What was your first emotion when realising that you were going to use the app?

-How come you said yes to participating?

Using the app

"Sum up what have been said. Now I have planned for us to talk about how it's been to use the app"

-Can you describe how it was the first time you used the app?

-Can you tell me in more detail about the last time you used the app?

-What is the best thing about the app?

-What is the worst thing about the app?

-Some say that these kinds of apps are more a strain than a helpful tool, how have you experienced it?

-Performance anxiety – Feeling forced – Opportunity

Goal-related payment

-How do you feel about the app being connected to the goal-related payment?

-How do you talk to your co-workers about this connection?

Work environment

-Can you describe your current work situation?

-Workload

-Social aspects

-What have the app meant for your work situation?

-One of the company's hopes was that the app could help open doors in the offices and that it would create kinship among the co-workers, what is your take on that?

Behaviour changes

-What is good health for you?

-What have the app meant for how you take care of your own health?

-Which is the biggest change?

-What would happen if you stopped using the app at the office?

The future

-If the company were to "start over" the app project, what would you like to change?

-In a perfect world, how would the future of the app look like according to you?

Finish

-Now I do not have any more questions prepared, is there something that you feel like I have missed?

"Sum up what have been said and the different themes/Show interview guides"

-Is there anything more that you would like to tell me or send with me? Any examples?

-Would it be ok if I get back to you if I have any more questions?

End recording

How did this feel?

Appendix 2 – Interview guide, mind-map

Start

- Walkthrough of the interview
- The information letter and purpose
- Any questions?
- Start the recording and ask for consent

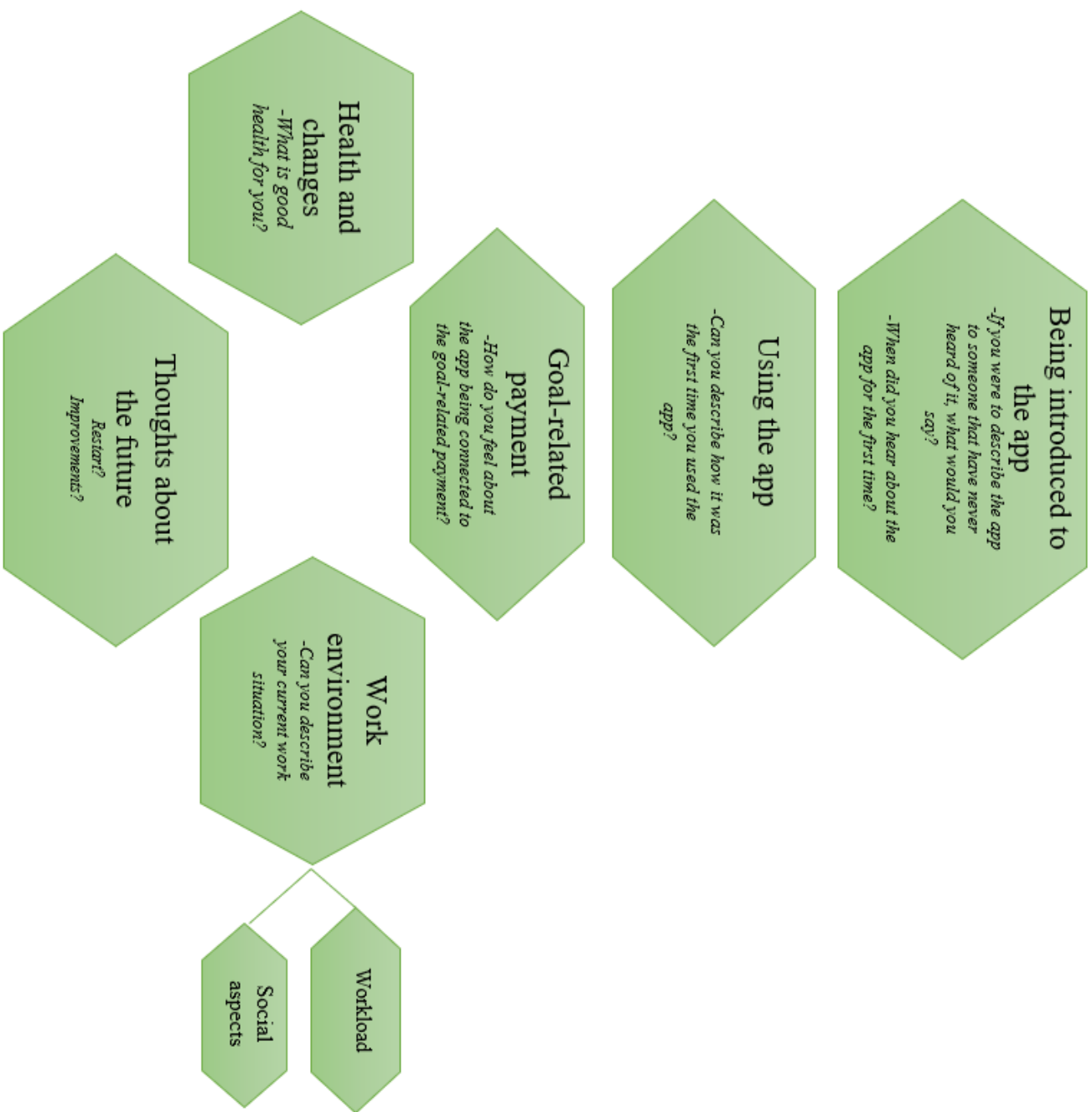
(Have you understood the information? Do you still want to participate in the interview?)

Background

- Tell me about yourself

End

- Now I don't have any more questions prepared, is there something that you feel like I have missed?
- Is there anything more that you would like to tell me or send with me? Any examples?
- Thanks for participation
- Would it be ok if I get back to you if I have any more questions?
- End the recording
- How did this feel?



Appendix 3 – Information letter and invitation

Information letter and invitation to participate in an interview about the health app

Who am I?

My name is Moa and I am a student at the Public Health master programme at Lund University. In order to develop my skills and knowledge of workplace-related public health, I will conduct scientific interviews in the thesis course. The purpose of the interview is to gain an increased understanding about employees' experiences of using a health promotion app at the workplace. The aim is to increase the knowledge on how to make app-based health promotion efforts in the workplace more effective and sustainable.

Information about participation

The interview will take about an hour and will focus on Your experience of using the health promotion app. I will visit You at the office during work hours. You will give consent before any interviewing starts. With Your consent the interview will be recorded to use for later analysis.

How will the information be handled and what will it be used for?

The interview will be conducted according to the guidelines for research ethics. Participation is voluntary and You may withdraw from participating at any time as well as discontinuing the interview. If a question comes up that You do not want to answer, say so and we will move on to the next question. Everything You share will be confidential during the whole process of data collection, analysis and presentation of the result. The results will be presented as the examination of the thesis course. Furthermore, the result will be presented to [*The company*]. The recording of the interview will be password-protected and erased at the end of the course in June 2020. You are welcome to ask questions before, during or after the interview if you have any further questions.

If you wish to participate in an interview, please let me know by email. My contact information is listed below.

Contact

Moa Eskilsson

mo1362es-s@student.lu.se

Popular science summary

People spend a large amount of their time in their place of work, making the workplace setting attractive for health promotion. As technology develops, so does health promotion interventions, making app-based intervention more common than ever in today's society. However, there are more apps than evidence, and the effects on health are often shown to be moderate. To make app-based interventions more effective and sustainable at the workplace, there is a need to understand the user's perspective.

In this study, eight individual interviews were conducted at an insurance company in Sweden that had implemented an app-based, health promotion project. A model was developed by using the information from the interviews. The model shows that when introducing an app-based intervention, there is a dilemma for the employee between gaining from the health benefits of the health promotion app project and losing their right to make decisions about their own health.

The experiences of the app were influenced by consequences that the insurance company had intended, for example that the economic incentive helped motivate employees to participate. However, unintended consequences did also influence that experience. For example, the economic incentive made employees feel like the intervention was mandatory to participate in. In the future, it is important to consider both intended and unintended outcomes, positive as well as negative, when implementing app-based health promotion interventions, in order to develop more sustainable interventions.