Radboud Universiteit Nijmegen

Customer experience and coping strategies in the use of mHealth technologies.

Master Thesis

Master of Science Business Administration Specialization Marketing

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Abstract

This Master's thesis explores users' negative experiences of technology adoption in the domain of mobile health apps (mHealth apps). The aim of this thesis is to identify the negative experience that arises from mHealth apps and how they affect the consumer. The evaluation of relevant and current literature represents the theoretical foundation of this research. The research question is answered based on insights from qualitative research in the form of a diary study. The sample consists of six diary study participants. As a result, many negative experiences are identified, such as sadness, disappointment, stress, and guilt. Thus, users apply coping strategies to manage these tensions. The five most apparent strategies are Discontinuing, Adjusting, Assuming Responsibility, Emotionally Distancing, and Ignoring. It is found that many paradoxes, tensions, and coping strategies are related and often contain several, subordinated facets.

Key Words: Negative Experience, mHealth Application, Coping Strategies, Negative Emotions

1. Introduction

1.1 Problem Description

Digital innovation is the use of technology to address current social and economic issues. The way of working, living, and communicating with one another have all been revolutionized (Fok et al., 2011). Several industries have seen a considerable transformation as a result of digital innovation (Fok et al., 2011). Healthcare is one of those industries. Digital technologies are revolutionizing healthcare by offering creative answers to age-old issues. A well-known example of digital technologies implemented in the healthcare and wellness industries is mobile health (mHealth) technologies. mHealth technologies have become increasingly prevalent in our modern society as a tool for managing health and wellness (World Health Organization, 2011). These technologies, which include mobile applications and wearables, aim to improve healthcare accessibility and empower individuals to take control of their well-being (Horst et al., 2015).

The use of mHealth technologies supports patients to remain motivated and committed to their health management objectives by monitoring behavioral patterns, such as the number of steps and calories consumed (Horst et al., 2015). Mobile health applications provide various advantages for healthcare. Access to healthcare services and information is increased, which is one of the biggest advantages. Patients may access medical information, have virtual consultations with doctors, and get prescription reminders via mHealth applications (Piwek et al., 2016; Albrecht, 2016). These applications also let users keep track of their symptoms and check on their health, which may be useful for spotting problems before they become serious and avoiding consequences. Moreover, by offering individualized feedback and assistance, mHealth applications can encourage healthy habits and lifestyles (Bort-Roig et al., 2014).

Despite the widespread adoption of mHealth technologies by such diverse users, many of them tend to quit using them after a short interaction (Lamonaca et al., 2015; Singh et al., 2016). According to recent research, more than a third of owners abandon activity trackers during the first six months of use (Ledger & McCaffrey, 2014). Users of mHealth reported feeling more accomplished, which led them to rely less on technology to fulfill their objectives: I don't look at it that much anymore. In the beginning, it motivated me after that, everything depended on me. I kept moving forward, I simply needed a little prodding (Karapanos et al., 2016). While a recent study

(Ledger & McCaffrey, 2014) found that more than a third of wearable activity tracker owners dropped them away within 6 months.

According to recent studies on customer experience and post-adoption behavior with mHealth technologies, the lack of sustained usage could be attributed to unintended, negative consequences arising from the usage of mHealth technologies (Blazevic & Klintwort, 2019). More specifically, the usage of mHealth technologies may give rise to conflicting – both positive and negative – consequences. Moreover, the experience of such negative consequences may be inextricably connected to the experience of positive ones, in what is known as 'technology paradoxes' (Mick & Fournier, 1998).

Technology paradoxes are defined as a situation when a technology, although providing important advantages, also generates unforeseen unfavorable effects or trade-offs such as stress, anxiety, frustration, and other negative emotions that could exceed those advantages. Research on technology paradoxes suggests that paradoxes lie inherent in the usage of technology and surface to customers' awareness through the experience of emotions. For instance, perceiving the usage of tech as the paradox of connectivity and isolation illustrates how technology may link individuals virtually while creating a sense of detachment in the physical world giving rise to feelings of stress and anxiety (Duss, 2018). Preliminary research into customers' experience with mHealth technologies has also confirmed the existence of paradoxes in mHealth technologies (Blazevic & Klintwort, 2019).

For example, mHealth customers may perceive the usage of a mHealth app as both working and not enjoyable. For example, walking has advantages for your health as well as being enjoyable. Thus, consumers may partake in these delightful activities for their own sake or for the advantages they offer externally. However, they tend to be obsessed over the goals they achieve which makes them feel stressed, dependent on their results, and frustrated if they are not able to achieve their target. So, consumers experience conflicted emotions, since they almost always carry their phones with them, and integration of mHealth apps is facilitated. On the contrary, users point out difficulties in integrating their apps, often due to technical issues and their apps' time-consuming character which make them feel frustrated, nervous, and dissatisfied. Linking to this, Jarvenpaa and Lang, (2005) found in their study, that when technology functioned according to users' expectations, they were satisfied. However, the non-functioning of their technology leads to feelings of frustration and depression.

Shedding negative experiences with the usage of mHealth technologies bears consequences not only for customers' well-being but also for how they use these technologies in the long term. According to Blazevic and Klintwort, (2019) have shown that when experiencing stress due to paradoxes inherent in the usage of their mHealth apps, customers attempt to cope with these negative emotions in ways that involve changes in their interaction with their apps. For example, many users stop using the apps after a period. Discontinuance is one of the main ways to cope with negative emotions. Coping is defined as the different coping mechanisms, actions, or patterns of thinking that people employ under hard or stressful circumstances (Wiepkema, 1991). According to Mick and Fournier (1998), there are two main categories of coping strategies, problem focus, and emotion focus mechanism. Problem-focused coping involves taking action to solve the problem causing the stress, such as seeking help or advice. The second is emotion-focused strategies, such as denial and distraction, which require either denying or diverting attention from the stressors. Emotion-focused coping involves regulating emotions and focusing on positive aspects of the situation. Despite the growing evidence about the negative experiences surrounding the usage of mHealth technologies and their role in eliciting coping strategies that alter customers' interaction with these technologies, there is still a considerable lack of research on this topic.

To bridge the existing knowledge gap, this study seeks to understand the experiences of mHealth application users and the strategies they employ to manage any negative emotions arising from its use. Participants will share their interactions with current mHealth apps, delving into the range of emotions they encounter, both positive and negative. They will also discuss the root causes of these emotions. Moreover, they will elaborate on the coping mechanisms they utilize and the rationale behind choosing these techniques to handle adverse emotions. In conclusion, participants will reflect on the emotional state they attain after applying their coping methods.

1.2 Relevance

1.2.1 Societal Relevance

There are a lot of reasons why this master's thesis is relevant for further societal implications. Firstly, the expected insights into customers' experience of using mHealth technologies and coping strategies may assist app developers and designers in making modifications that will help users have more pleasant experiences, detect bad ones, and support their strategies to cope. To give users a more pleasurable and user-friendly

experience, these changes may involve enhancing the application's functionality, user interface, and design. Additionally, by identifying and addressing the causes of the negative feelings that users experience while utilizing the program, the developers will be able to alter the application in a way that will minimize or eliminate these negative feelings. The developers will be able to help the coping mechanisms users utilize to control their negative feelings when utilizing the application. This can entail giving people access to tools like tutorials, films, and other instructional materials that might help them better regulate their negative emotions. The goal is to make sure users of the mHealth application feel encouraged, involved, and empowered to control their negative emotions.

Second, healthcare professionals will become more aware that the implementation of mHealth technologies does not guarantee their continued use since users may experience problems and find strategies to deal with them that may reduce their use. By gaining knowledge about the coping strategies employed by users of mHealth applications, healthcare professionals can enhance their guidance and coaching techniques. Integrating user coping strategies into coaching sessions, along with established stress reduction techniques like mindfulness exercises, can provide a more comprehensive approach to patient care. This comprehensive approach acknowledges the individuality of coping mechanisms and empowers professionals to tailor their support to meet the unique needs of each patient, fostering better outcomes and improved well-being. Taking into consideration user feedback and experiences, the expert may also collaborate with the creators of the mHealth app to enhance the app's functionality and design. This partnership may result in the creation of better coping mechanisms and enhanced user experiences.

Finally, users may be made aware of the potential for bad experiences and may need help in order to manage them in ways that are beneficial in order to achieve their health objectives. They may choose apps that have undergone user experience testing and evaluation. This might assist users in avoiding apps that might make them feel frustrated, anxious, or have other negative feelings. Users can also search for apps with lower drop-out rates, as this may show that the app offers a good user experience and caters to their needs. Users can also control their expectations before using an app, which helps lessen the strength of any negative emotions they might have. Users are less likely to be let down or annoyed if they have a more accurate idea of what to anticipate from the app.

1.2.2 Academic Relevance

The literature on coping strategies in the context of mHealth apps is currently limited. While coping strategies have been extensively studied in various domains of technological advances (Mick & Fournier, 1998) their applicability to mHealth apps remains relatively unexplored due to the unique nature of these apps. It is essential to investigate the effectiveness of coping strategies within mHealth apps to determine whether they can effectively support users in managing their health and well-being.

Understanding in depth how coping mechanisms affect the usage of mHealth apps is crucial for further research in both marketing and healthcare literature. In terms of marketing, it is important to explore the dynamic customer experience and how it evolves over time in the context of coping strategies. By understanding how customers engage with coping strategies within mHealth apps and how their experience evolves, marketers can design more tailored and effective strategies to meet customer needs and expectations.

The usage of smart devices such as mHealth applications raises privacy concerns. Lupton, (2017) claimed that privacy concerns influence the usage and enjoyment of smart devices. This is especially relevant for the sensitive topic of mobile health because it is strongly related to people's health and well-being.

2. Theoretical Background

2.1 mHealth

In the scientific literature, innovation is a multi-level concept with several meanings. There are several ways to innovate. From minor adjustments to current goods or services to drastic adjustments that completely restructure whole sectors (Fok et al., 2011). Innovation has been crucial in promoting economic progress and raising people's standards of living all across the world. Smartphones are an important technical advancement. “The smartphone is by far the world’s most popular and intrusive electronic device” (Rotondi et al., 2017, p.25). People's everyday lives have been deeply incorporated by smartphones, which are seen as an "almost unseen motor of modern existence" (Roberts et al., 2014, p. 264). The use of mobile applications has expanded along with the use of smartphones (Salehan & Negahban, 2013).

Mobile applications are one of the most important businesses nowadays (Dogtiev, 2018). The software is often used for a number of purposes. Using technology, users may acquire new skills, interact with others online, or look up

information on the Internet (Salehan & Negahban, 2013). According to the World Health Organization (2011), mHealth is a program that uses mobile devices to enhance medical and wellness activities. Applications for smartphones and tablets known as "m-health apps" can be used for health research, services, or to improve health outcomes (Hernandez Munoz, 2015; Albrecht et al., 2016). For this thesis, "mHealth apps" are programs that are used on smartphones to track a user's health. Globally, there are more than 300,000 m-health applications available in app stores, and that number continues to rise (Pepper, 2013). Additionally, mHealth tools enable the evaluation of elements including daily mood, caloric intake, step count, and sleep quality. The software then compiles all the user-supplied data and displays the user's progress graphically (Horst et al., 2015).

Numerous research on mHealth applications have been conducted; the results point to the potential for well-designed mHealth apps to empower users, improve drug adherence, and reduce healthcare expenditures (Forbes, 2017; Sharon, 2016). As a result, providing data to physicians directly can lead to more precise diagnoses (Martin et al., 2017). According to studies, the most downloaded mHealth applications were mostly grouped in the fitness category and focused on topics like heart rate, weight loss, and fitness (American Heart Association, 2015; Whiteman, 2014; Research2Guidance, 2014). Users can better understand their progress toward their health goals and maintain their motivation to make healthy choices by keeping track of these habits (Bort-Roig et al., 2014). In other words, users can change their daily routines and uphold good behaviors by observing, for instance, how many calories they've consumed or how many steps they've done during the day.

2.2 Users' Experience with the mHealth Application

Customers' experience with mHealth applications is a very controversial topic. On the positive side, studies discovered a favorable correlation between users' good effect and their use of social and entertainment applications (Carter et al., 2018). Although this technology has received a lot of support as a tool to encourage physical exercise, there may be a drawback if it is used excessively.

According to many studies, the reinforcement of societal standards and expectations around things like body size and shape is a disadvantage that can develop self-quantification into an obsession that diminishes the pleasures of daily life (Karapanos, 2016, Etkin, 2016). When people don't achieve their fitness objectives or compare themselves to others who are more active, they could also feel guilty or

ashamed, which can exacerbate already unpleasant feelings (Lupton, 2016). Some users could become fixated on attaining their objectives, even if it means overexerting themselves or sacrificing other aspects of their health. An overemphasis on measuring and quantification has the risk of detracting from the overall enjoyment of participating in activities (Karapanos, 2016; Etkin, 2016).

Moreover, the lack of personalization in mHealth apps may restrict their utility and user engagement (Etkin, 2016). Some applications might not offer users enough assistance or direction, leaving them feeling confused and abandoned (Blazevic & Klintwort, 2019). Feelings of isolation and separation may also be brought on by a lack of interpersonal engagement. Furthermore, a short-term numerical target-driven approach to health and wellness may conflict with long-term objectives and values, underscoring the necessity for a balanced approach (Pettinico & Milne, 2017).

Furthermore, the accuracy and reliability of self-tracking tools may be jeopardized, especially those that depend on self-reporting or estimation, like food or mood trackers (Etkin, 2016, Blazevic & Klintwort, 2019, Duus, 2018).

The authors also pointed out that the usage of such devices can be stigmatizing, possibly causing guilt or humiliation, and having an effect on people's mental health and well-being. According to Lupton (2016), this phenomenon is defined as the “tyranny of health”. The pressure to fulfill the activity tracker's unattainable goals, which can cause stress and burnout anxiety, frustration, and even obsession as a result of using wearable activity trackers (Etkin, 2016; Blazevic & Klintwort, 2019, Duus, 2018; Karapanos et al., 2016). In other words, users risk losing their sense of autonomy and enjoyment from exercise if they depend too heavily on the activity tracker to tell them how much physical activity they should be getting (Mick & Fournier, 1998). For instance, a person who continuously checks their activity tracker to see if they've reached their daily step goal may become discouraged if they do not.

Finally, concerns about privacy risks and implications for ethics are among the issues raised by the usage of self-tracking devices and quantification tools. People may be more susceptible to data breaches and the disclosure of personal information because the data that these gadgets capture is sensitive and personal. Additionally, the gathering and use of personal data for self-quantification purposes develop ethical questions, particularly regarding the possibility of exploitation by businesses and people who are overly preoccupied with self-optimization (Etkin, 2016; Blazevic & Klintwort, 2019; Duus, 2018). Technology use has the potential to weaken personal freedom and privacy

by introducing new mechanisms for social control and monitoring. As a result, it's crucial to strike a balance between the use of self-tracking and quantification tools and a comprehensive strategy that takes into account the complexity and depth of our experiences (Pettinico & Milne, 2017; Etkin, 2016).

2.3 Coping Strategies

Coping is described as the shifting attitudes and behaviors a person employs to deal with the internal and/or external pressures of a particular person-environment interaction that is deemed stressful (Lazarus, 1991, 1999; Lazarus & Folkman, 1984). Adapting to stress is defined as "the individual reaction to a stressor by which the ordinarily damaging physiological consequences of this stressor are decreased," by Schouten and Wiepkema (1991, p. 126). The transactional framework assumes that, before acting on any coping strategies in a specific stressful situation, a person first critically assesses what is at stake (primary appraisal) and what can be done to deal with the situation (secondary appraisal of control over the stressor). There is a plethora of coping mechanisms that consumers employ when faced with challenging consuming situations (Lazarus, 1991, 1999; Lazarus & Folkman, 1984).

Explorations into various domains, including smartphones (Bruzzi & Joai, 2009; Jarvenpaa & Lang, 2005), electronic banking (Munene et al., 2002), self-serving technology (Johnson et al., 2008), and social networking sites (Zhuang et al., 2012), have shed light on the concept at hand. Mick and Fournier (1998) claimed that consumers express strong, and negative emotions towards technological products, subsequently activating coping strategies. Coping strategies are the way consumers manage paradoxes, and thus either increase or decrease conflicting tensions, such as feelings of competence and incompetence (Mick & Fournier, 1998). The concept was further applied by many researchers, nevertheless with a limited number of technology products (Bruzzi & Joai, 2015; Jarvenpaa & Lang, 2005; Munene et al., 2002).

Coping strategies are divided into two techniques. The first is problem-focused techniques, such as actively seeking social support and positive reframing, which entail actively seeking assistance or positively reinterpreting the issue. Problem-focused coping refers to active engagement in resolving the underlying problem causing stress, typically through seeking assistance or guidance (Mick & Fournier, 1998). Notably, the study revealed that individuals who employed problem-focused coping strategies reported reduced stress levels and heightened job satisfaction. Conversely, emotion-focused coping strategies encompass approaches such as denial and distraction, which

involve either disregarding or diverting attention from stressors. Emotion-focused coping entails the regulation of emotions and directing focus towards positive aspects of the situation. When individuals justify their technology usage, they often emphasize its practical advantages, such as enhanced efficiency or productivity, while downplaying its emotional implications (Mick & Fournier, 1998).

Avoidant coping involves avoiding or denying the problem causing the stress (Beaudry & Pinsonneault, 2005). In other words, consumers may choose to ignore or minimize the negative effects of technology, ignoring warning signs of addiction or rationalizing negative impacts as acceptable trade-offs for its benefits (Mick & Fournier, 1998, Beaudry & Pinsonneault, 2005). Gabbott et al., (2011) focus on coping strategies in the context of service failure. The study found that customers use a variety of coping strategies in response to a service failure, including problem-focused coping (e.g., seeking solutions to the problem, complaining to the company), emotion-focused coping (e.g., seeking emotional support from friends or family, distracting oneself from the problem), and avoidance coping (e.g., ignoring the problem, giving up on finding a solution). The authors found that problem-focused coping was associated with better service outcomes, including greater satisfaction and loyalty, while avoidance coping was associated with poorer outcomes. However, the study also showed that the relationship between coping strategies and service outcomes was moderated by emotional intelligence, suggesting that the effectiveness of coping strategies may depend on customers' ability to regulate their emotions.

In a quantitative examination by Chae and Yeum (2010), the relationship between paradoxical experiences with mobile technology, anxiety, stress, and coping strategies was empirically tested. The findings demonstrated a positive association between technology-related paradoxes. These findings align with prior studies conducted by Chae and Yeum (2010), Munene et al. (2002), and Mick and Fournier (1998). The identified paradoxes prompted individuals to employ avoidance strategies, such as minimizing interest or evading mobile device usage, a phenomenon supported by Mick and Fournier (1998) and Zhuang et al., (2012).

3. Methodology

The used method for this research was qualitative because it provided a general understanding. In circumstances where there is inadequate current knowledge, very helpful (Dressing et al., 2013). Quantitative approaches can provide comprehensive

answers to questions about people's experiences and behavior which were very accurate to this study (Hussy et al., 2013). For qualitative research, precise hypotheses were not required, but a stated goal must have come first (Cropley, 2011). This study consisted of diary keeping. There were numerous viewpoints on the characteristics of qualitative research, but they all concur that they include gathering data to answer research questions, setting up clear roles for the interviewer and interviewee, encouraging candid responses, and gathering in-depth data (Evers & de Boer, 2012).

Diary techniques are one of the trustworthy sources of gaining consumer information (Arsel, 2017). Also, the diary technique permits the collection of longitudinal data, which is used by many academics to acquire an understanding of the participants' real-world experiences (Asimakopolous, 2017; Derks & Bakker, 2014). One of the advantages is the less lag time between the experience and the narrative of the experience, as a result, the information provided was more comprehensive and objective than if it were presented from a historical viewpoint (Bolger et al., 2003).

3.2 Participants' Characteristics and Sampling

The formal selection of a population subgroup is not necessary for qualitative research (Flick, 2007). The sample should reflect the phenomenon's applicability by capturing respondents' experiences and worries about the problem (Flick, 2007). In this study, respondents were chosen based on their everyday use of mHealth applications and their level of familiarity with them; expert expertise was not required. By employing snowballing strategies to find responders from the author's network of contacts, convenience and relevance to the study's objectives were also factors. The respondents were selected from a wide range of population characteristics (Flick, 2007). Twelve participants were recommended by Adler and Adler (2012) for thesis-related objectives to provide realistic planning, conducting, transcribing, and evaluating interview time frames (Flick & Salomon, 2012).

3.3 Data Collection Procedure

The data collection took place in April – May 2023. Before the start of diary data collection, participants were requested to fill out a questionnaire and provide their demographic characteristics such as age, educational level, mHealth app usage (including technologies and activity tracking), motives for using mHealth, and usage patterns to link them to the diary by numbers so that demographics can be taken into account when analyzing data. Finally, participants were provided with instructions outlining the order to understand clearly the diary-keeping phase. The questionnaire is

designed by Qualtrics, an online tool for designing, distributing, and collecting data from online surveys (Singh, 2007; Qualtrics, 2019).

Respondents were asked to record their experiences via the diary method for the period of April to May 2023. The diary method usually lasts between 10 and 30 days (Silvia & Cotter, 2021). The chosen diary-keeping phase was two weeks. If reporting periods are too long, respondents may become disengaged which could affect study quality. The questionnaire used a standardized scheme to record data. Each question was the same for all participants and administered equally (Corbetta, 2003).

The diary data collection was done using the end-of-the-day approach. They completed diary entries once a day in the afternoon to investigate ongoing experiences in a natural, daily context (Bolger et al., 2003). End-of-the-day sampling allowed sufficient opportunities for interaction with mHealth daily. This provided opportunities for emotions to be elicited by mHealth use and coping strategies. A thorough reflection on possible coping strategies may require more time as known coping strategies often involve multiple phases such as distancing (not using the app for some time before returning to its users). End-of-the-day sampling was also selected due to participation. The diary questions for this thesis research were conducted in the form of open-ended questions. This format is well-structured to address aspects related to the study's topic meaning that questions are clear and broad while leaving space for respondents to offer new ideas. It can be used as the only method or, as in this research, one of several methods. A key benefit was the possibility of obtaining both lived experience and theoretically driven aspects of interest to get new and different insights from the participants.

The diary data were collected in audio-record format. Using audio-recorded diaries as a research method captures experiences at the moment they occur, which was helpful for researchers to understand their complexity (Bokhove & Downey, 2018). This method also reduced the bias that may arise when participants knew they were being observed or had to write down their experience (Thissen, 2014). Written records depended on a participant's ability and willingness to record experiences. Multiple entries can increase known problems of diary studies such as participant attrition, item-missing bias, and selective response due to the considerable burden of completion (Stone et al., 1991). Collecting voice recordings instead of requiring written observations decreases participant burden since most people can talk much faster than they can write or type (Burton & Nesbit, 2015).

The participants sent their responses through social media platforms such as Messenger, Instagram, WhatsApp, and Viber. Diary questions were conducted in English and the final answers from the participants were provided in English. However, to make it easier and more for the research questions to be translated into their native language in this way it was easier for them to express their feelings and thoughts. Consider conducting a one-day trial with audio recording so participants familiarize themselves with the method. Participants were able to ask for help and more details any time they were confused during the research period.

3.4 Data Analytical Approach

After conducting the diaries, the audio data were transcribed using simple rules for easy readability. Prioritizing interview content by omitting empty words and sounds without changing the key message (Dresing & Pehl, 2013). It was used Content analysis (Gheyle & Jacobs, 2017) to analyze data from both diary studies. The data collected from diaries and interviews underwent content analysis, a research technique for making valid inferences. For this research, an abductive approach didn't rely on rigid hypotheses or data that spoke only for itself. Abduction involves working from the consequence back to the cause or antecedent (Denzin, 1989). The key idea behind abduction was that explanations are constructed by making inferences from the observed effects to the most likely causes or antecedents. It involved considering various possible explanations, evaluating their plausibility, and selecting the one that best fits the observed data The research's results combined existing ideas or derived from new insights (Reichertz, 2013).

3.5 Research Ethics

According to Katarzyna and Czarnota-Bojarska (2021), the main consideration for a diary study is user-friendliness. Participants must use the diary over an extended period, so it should be easy to use. This reduces stress and ensures that participants can complete the daily survey in 10 to 15 minutes. Another important ethical aspect of research was obtaining 'informed consent,' meaning participants should understand what was asked of them and how their data were used (Fleming & Zegwaard, 2018). The first survey's introduction clearly stated the research purpose and expectations for participants.

Another ethical aspect was the risk of anonymity. To lower this risk, participants remained anonymous. The researchers kept their identities confidential and referred to them by a number (e.g., R1, R2). Fleming and Zegwaard (2018) recommend this

approach. Additionally, recordings won't be shared or published. After the end of the research, the data will be deleted.

Moreover, another ethical aspect was voluntary participation and to lower the pressure on the participants they were free to discontinue at any time during the process. Participants were asked if they were willing to record themselves. Researchers only used these recordings for transcription purposes. Moreover, participants were free to contact the researcher every time they were willed, and at the end of the research, the result of the study can be shared with them not overload since coping was not always right after an event has occurred.

4. Research Results

In the following, the results from the analysis of the diary entries will be presented. During the analysis, it was examined which feelings and coping mechanisms were experienced by the participants. Firstly, the group of respondents was composed of seven people. However, one of them did not complete the research. The participants' gender division was women making up 80% of the group and males forming the remaining 20%. The participants were a young group, with an average age of 23, and most had obtained or are going to obtain a bachelor's degree. Moreover, when taking a closer look at the types of mHealth apps used, most respondents indicated that they used activity trackers, usually step counters on their respective. The remaining participants submitted their responses through the 14 days of research.

4.1.1 Positive Experience Results.

The results of the master's thesis study revealed several important findings regarding the participants' experiences and emotions related to their physical activity tracking.

Happiness

The aspect of "happiness" was mentioned by all of the respondents as being one of the main experiences after using mHealth apps. Respondents mentioned this positive experience with the term "glad" to describe their feelings. Participants expressed when they did achieve the goal that they had set for themselves or the app had set for them.

"Happy to achieve the goal with no pressure"

"I'm glad that I made it today…. 10,000 steps and continuing" - R4

Surprise

Another positive feeling that arises from the respondents is “surprise”. Participants expressed surprise as a positive feeling at the magnitude of their steps taken, as revealed by the tracking device Without the device, they would not have been aware of the extent of their physical activity, indicating that tracking devices can provide valuable insights regarding one's movement patterns.

“Wow…, I was surprised with my performance. The truth is that I wouldn't have realized that I had taken so many steps without it” -R3.

Pride

Additionally, participants expressed pride in their performance, with one individual (R3) stating that they did surprisingly well, surpassing their previous records. This sense of pride indicates a boost in self-esteem and confidence resulting from their exceptional achievements.

“I did surprisingly well, breaking every record of the previous days”- R3

One participant described feeling pride and internally acknowledging their achievement. The following phrase shows that had the confirmation that enhanced their self-esteem and made them feel that they accomplished their goal.

"Good job, girl."- *R1*

This demonstrates a sense of personal fulfillment for accomplishing their physical activity goals. Another participant (R4) reported feeling pride after running for an hour, highlighting the sense of accomplishment and enjoyment derived from physical activity.

“I ran for an hour”- R4

Motivation

Another positive feeling that arises from the research is the feeling of being active or motivated. Those are two terms that respondents use to express their feelings. One participant (R7) mentioned that using the tracking device made them feel like they were actively engaged in doing something. This finding suggests that tracking devices can promote a sense of activity and encourage individuals to maintain physical activity levels

“This makes me feel like I’m trying to do something since I am not going to the gym or exercising”- R7

Moreover, feelings of motivation were identified among the participants as they planned to set higher-step goals and expressed hope of achieving them. This

demonstrates that tracking devices can inspire individuals to continually challenge themselves and strive for higher levels of physical activity.

"The goal was again 8000 steps….and I think that I will set the everyday step goal to 11.000… I will change my step goal and I hope that I will be able to achieve it" -R7

However, it is important to mention that there were conflicting emotions. One participant (R2) expressed conflicting emotions, feeling tired from walking a lot, but planning to rest and recover for the next day,

"*I'm not happy I was feeling tired because I walked a lot and this makes me feel tired but I will rest and tomorrow I will be fine" -R2.*

The first part of the statement speaks to R2's immediate emotions. They walked extensively, which led to tiredness, a physical state they weren't pleased with. Their use of "not happy" underscores a negative emotional reaction to the physical exhaustion they faced due to their activity. Contrary to the first part, this segment demonstrates a forward-looking, positive attitude. Despite their current fatigue, R2 is hopeful about the next day. They believe that after resting, they will regain their energy and feel better.

4. 2.2 Negative Experience Results

However, the research findings of the master's thesis provide insights into the negative emotions and experiences expressed by participants about their physical activity tracking.

Sadness

A negative feeling that participants reported through the research is In this context, some users mentioned being sad when they did not carry their phones or not feeling happy because they did not achieve their daily goal.

"I forgot my phone and I did not track my steps today, that's sad because I walked a lot"- R4.

"I'm not happy with my performance today…" -R3

Guilty

Participants expressed negative emotions such as feeling guilty and having remorse for not finding the time to walk (R1). This suggests that individuals may experience a sense of regret and self-blame when they are unable to prioritize physical activity amidst their daily responsibilities. The feeling of guilt arises because the app showed that they didn't achieve their goal which means that the app disconfirms their choice.

"I'm not feeling okay because I had the time to do it and I didn't, I have remorse for that "-R3, R2.

Disappointment

Additionally, participants expressed disappointment when their step count and burned calories did not meet their expectations (R4, R2). This reveals that individuals may have set higher expectations for their physical activity outcomes, and falling short of those expectations can result in feelings of disappointment.

"I was expecting more steps and burned calories" -R4, R2

Embarrassed

Interestingly, one participant (R7) described feeling embarrassed regarding their low step count This suggests that individuals may experience a negative emotional impact when perceiving their physical activity levels as below what they consider socially acceptable.

"This is so embarrassing" -R7.

Shocked

The same participant (R7) expressed feelings like shock upon realizing their low step count, indicating surprise at the extent of their physical inactivity

"*I was like wow there are only 1000 steps" -R7.*

Bored

Furthermore, participants mentioned feeling bored and lacking motivation to go out and engage in physical activity. This indicates that factors such as monotony or a lack of interest can contribute to a reduced willingness to engage in exercise or outdoor activities, leading to decreased physical activity levels.

"I had time but I didn't want to go out" -R2.

4.2.3 Coping Strategies

The findings of the master's thesis research are aligned with the findings of previous research that are addressed in the theoretical context. However, this research shows that the coping strategies that are employed by participants to address challenges and manage their physical activity tracking are emotions-focused techniques.

Emotions focus techniques

Regarding emotions-focused techniques, participants utilized different strategies to cope with their emotions and maintain a positive mindset.

Comforting

One category identified was comforting. Comforting coping mechanism is a technique that provides a sense of comfort, solace, or relief during times of distress or difficulty. This mechanism can help individuals manage their emotions, reduce stress, and regain a sense of inner calm. Participants employed a comforting reinterpretation of the situation by considering it as a resting day

"I will consider it as a resting day" -R4, R1

Moreover, participants engaged in justifications by making excuses such as having a busy day, not wanting to push themselves too much, or citing unfavorable weather conditions. This allowed them to rationalize their lower activity levels and alleviate any feelings of guilt or pressure. This shows that in this way they avoid their negative emotions and making excuses is easier for them to lower their negative experience.

"I had a busy day, I don't want to push myself too much, bad weather conditions" -R2, R3

Adjusting

Adjusting is also a subcategory of emotion-focus mechanisms for coping with negative experiences. Respondents expressed that they adjusted and adapted their behaviors, mindsets, or habits to the requirements of the app to relieve themselves of tension and to adjust their emotions. Setting fewer steps to make it easier to achieve their daily goal. These strategies allowed participants to ease their emotional burden and find comfort in adapting their goals to the circumstances. Participants exhibited behavioral adjustment by planning to be more active the following day or aiming for higher step counts to balance out their activity levels. This proactive approach to adjusting their behavior highlights their determination to overcome challenges and maintain a positive attitude toward physical activity tracking.

"I set myself fewer steps to make it easier for me to achieve my everyday goal" -R1.
"Tomorrow, I will push myself to be more active" -R3.

One participant (R2) mentioned the strategy of keeping their phone with them as a means to ensure they can track their physical activity accurately. This shows that respondents are seeking help with the devices in this way they do not have negative feelings and thoughts but at the same time, they are adjusting their behavior to eliminate negative experiences.

"I will keep my phone with me next time, so I can track my steps" (R2).

5. Discussion

5.1 Overview

This thesis's research results were obtained through diary entries. The study of the information collected reveals the respondents' experiences with mHealth apps and the research's extensive coping mechanisms that are used. As stated at this thesis's beginning of this thesis, numerous researchers have discovered problematic user experiences and coping mechanisms for the technology domain (e.g., Mick & Fournier, 1998; Jarvenpaa & Lang, 2005). Using as the foundation for this thesis the research by Mick and Fournier (1998), the results of this thesis research are based on many insights from earlier studies, but they also make distinctions because it is focused on negative emotions and coping mechanisms that occur from the usage of mHealth apps.

5.1.2 Users' Experience

The findings of this thesis focus on users' experiences and coping mechanisms. In the context of positive and negative experiences and emotions, the finding is similar to those that are already presented by Mick and Fournier (1998). One of the main reasons people use mHealth apps is to exercise through self-monitoring. When self-tracking is voluntary and self-driven, it is referred to as "private self-tracking" (Lupton, 2017, p. 2). This study showed that some respondents depended on the app's output for their sentiments and moods. Swan (2013), suggested that data mediated the sense of reality, while Lupton (2014a), expressed the opinion that data was thought to be a superior type of knowledge. People, when they are dealing with an unpleasant situation, tend to feel negative emotions like dissatisfaction, tired, bored, and sad. Participants of this study experienced similar negative emotions.

Additionally, the findings of this study indicate that the feelings of pride and shame are directly tied to the experience of confirmation and disconfirmation. When respondents' expectations are achieved or exceeded, they experience feelings of pride, however, when performance falls short of expectations, users experience feelings of remorse or embarrassment. In this study, participants provide their consent to have their actions, emotions, or performance verified by their mHealth app's data. Users report feeling better on a terrible day as a result of the app's signal and feeling better after the app confirms their expectations, so this confirmation could be positive or negative. Since the user can immediately see the results of his actions, self-tracking can also be viewed as a self-assurance tool (Duttweiler, 2016).

Additionally, this research shows that in connection with step counters, respondents usually describe their goal as reaching the recommended 10,000 steps, which can be defined as a social standard, according to Duttweiler (2016). Standards, or more precisely setting attainable goals to avoid conflict, could increase motivation through goal challenges (Bandura, 1991). Furthermore, respondents of this research express they are motivated to improve their performance by changing their behavior by walking more to reach their goals, eating more consciously, or remaining in the allowed calorie range. When goals or the acceptable level of performance were not reached the performance was negatively evaluated and the source of dissatisfaction was either eliminated or the user's performance was improved (Latham & Locke, 1991).

According to, Higgins "different types of self-discrepancies represent different types of negative psychological situations that are associated with different kinds of discomfort" (Higgins 1987, p. 319) when respondents' performance is not confirmed. This research shows that tensions arise when there is an unacceptably significant and apparent disconnect between performance expectations and actual performance. Additionally, Otnes et al., (1997) highlighted anticipation vs. reality as one of the antecedents of consumer ambivalence. Respondents frequently react with disappointment, annoyance, and guilt when the actual performance is below expectations.

The motivating aspect of mHealth apps is positively acknowledged by almost every respondent in the research. According to Asimakopolous et al., (2017), this research presents that motivation is enhanced through personal data-based insights, which mHealth apps offer. Bandura (1991), stated when there was noticeable evidence of progress, self-observation improved performance. Self-tracking tools can be motivated by providing numerical performance indicators instantly and are rewarding when one does well and encouraging when performance is lacking (Paddock, 2013). This is also confirmed in the research where respondents are mostly motivated by positive results but negative results sometimes also serve as a source of motivation.
In this study, respondents were motivated to increase their everyday goals when they were able to reach them easily. On the other hand, they were motivated to walk or exercise more the next day when they realized they hadn't reached their daily goal.

5.1.3 Coping Strategies

After adopting their mHealth apps, respondents often develop conflicting attitudes as a consequence of their experience. This finally leads to users applying coping strategies. Mick and Fournier (1998) suggested that when consumers' everyday life is negatively influenced by technology, negative experiences appear more salient and consumers often apply coping strategies to be relieved of negative emotions. Coping strategies were discussed by several studies (e.g. Otnes et al., 1997; Mick & Fournier, 1998; Jarvenpaa and Lang, 2005; Yi & Baumgartner, 2004). In this research, these strategies can be described as problem-focus techniques and emotion-focus techniques. Similar to this, many of the studies mentioned above distinguished coping strategies into avoidance and confrontative strategies, whereas Mick and Fournier (1998) further differentiated the stages of pre-acquisition and consumption.

Adjusting

Adjusting was a coping strategy applied by respondents. The research reveals that users adapt their behavior to the requirements of the app to relieve tensions. This can lead to users becoming more conscious about themselves, their habits, and behaviors. Thus, they often adjust or increase their activity to the perceived requirements of their respective apps. Linking to this, Mick and Fournier (1998) termed this coping strategy 'accommodation', where consumers changed preferences and routines according to the perceived demands of their technological products. This coping mechanism is especially prevalent for activity apps, as respondents reveal that exercise to satisfy their app.

Comforting

Expanding on the findings of Tice et al., (2001), researchers pinpointed a specific behavior pattern called "self-defeating behavior." At its core, this behavior involves actions or decisions that might not be in the best interest of the individual and could even hamper their well-being or goals. Delving deeper, it was observed that this self-defeating behavior was closely tied to certain coping mechanisms. Specifically, individuals often resorted to this kind of behavior when they were engaged in coping strategies labeled as "comforting" or "mentally abandoning." When using these coping strategies, individuals might momentarily sideline their self-regulation or self-awareness in an attempt to find immediate relief or comfort, even if it means acting against their long-term interests. In essence, during moments of extreme stress or

emotional turmoil, people might adopt behaviors that offer instant comfort but may be detrimental in the long run.

Baumeister et al., (1994) characterized this failure in self-regulation as a pervasive source of human unhappiness. It is worth noting that the coping mechanism of "mentally abandoning" was frequently observed in the research and did not appear to be more severe than other coping strategies. The concept of mentally abandoning entails temporarily disregarding a goal, including the associated requirements of an application, to alleviate stress and tension. This coping strategy is often employed when individuals fail to achieve their performance goals or when they come to the realization that these goals are unattainable in a realistic manner. Bandura (1982; 1991) supports this notion by suggesting that negative discrepancies or a sense of low personal efficacy can lead to consumer apathy. Furthermore, individuals tend to resort to spontaneous impulses for immediate emotional relief when they are upset or emotionally distressed, thus prioritizing short-term affect regulation (Tice et al., 2001; Baumeister et al., 2001). Consequently, when respondents perceive their ability to improve their performance as limited, they often temporarily abandon their desires and goals and disregard the requirements of the application.

5.2 Contribution to the Knowledge

This thesis contributes to the existing body of knowledge on several fronts. Firstly, given the relatively nascent nature of mHealth apps, there is a scarcity of academic literature and research about this domain. Therefore, this thesis addresses this gap by applying the concept of technology negative experience, using as a foundation the research introduced by Mick and Fournier (1998), to the novel context of mHealth apps. In doing so, it not only fills a void in the academic literature but also extends existing theories and prompts further avenues for research. Moreover, scant attention has been given to consumer behavior and experiences following the adoption of technology, as the focus has typically centered on behavior preceding adoption (Munene et al., 2002b; Gill & Saad, 2010). Consequently, this research contributes to the theoretical understanding by primarily examining consumer behavior after technology adoption. One of the main findings of this research is that users of mHealth applications tend to develop obsessive feelings about their outcomes which consequently lead them to develop negative feelings such as disappointment, sadness, and guilt. Those negative feelings lead them to drop off the usage of mHealth apps (Blazevic & Klintwort, 2019).

The coping strategies proposed by Mick and Fournier (1998), namely confrontative and adjusting strategies, have been corroborated by this research within the domain of mHealth apps. Users tend to adjust their everyday goals to reach them and not develop unpleasant feelings or they tend to find excuses so they would feel guilt that they didn't reach their goals. Consequently, this study expands our knowledge regarding consumer coping mechanisms within the context of mHealth apps. Finally, a noteworthy finding of this research is the identification of the coping mechanism termed "mentally abandoning," (Mick & Fournier, 1998). This phenomenon pertains to a particular behavioral response among consumers. When confronted with heightened emotional distress or turmoil, these individuals consciously decide to set aside their usual patterns of self-discipline. By doing so, they allow themselves a temporary respite, diving into fleeting indulgent behaviors. This is not a random act but rather a targeted strategy to counterbalance and alleviate the pressing emotional challenges they face. Through this mechanism, they hope to find a transient solace or reprieve from the emotional burdens that weigh them down. This finding holds relevance and contributes to our understanding of coping mechanisms adopted by consumers in similar contexts.

5.3 Practical Implications

The research's results reveal several paradoxical tensions and contradicting emotions (Mick & Fournier, 1998), which have the potential to harm the consumers' experience with mHealth apps. It is important for companies that develop mHealth apps to be aware of the ambivalent emotions and perceptions consumers hold, to provide the best possible product. To gain a deeper understanding of consumers' behavior and mindsets (Ledger & McCaffrey, 2014), companies could implement an algorithm, that tracks users' habits and preferences. This algorithm could function like a diary in which users can record everything related to their fitness and well-being journey. This can be consequently applied to divide users into groups to target them differently in this way it will develop more personalized programs for each user. This function can be very helpful for stakeholders. They will encourage the benefits of fitness through mHealth apps and for users because they will be more satisfied with their well-being and fitness journey.

The findings of this research shed light on the negative emotions that can potentially undermine consumers' experiences with mHealth apps (Ledger & McCaffrey, 2014). To reduce negative emotions stakeholders could inform users that in their fitness and wellbeing process, they will experience negative feelings, so they can

be aware of those emotions. In this way, they can prevent users from giving up on the apps easily and use them for longer periods. Consequently, to develop a more profound understanding of consumer behavior and mindsets, it is recommended that companies implement an algorithmic approach to track users' habits and preferences. This algorithm can utilize parameters such as usage frequency and intensity to classify users into distinct groups, enabling tailored targeting strategies.

As a result, mHealth apps should incorporate a dedicated section for privacy settings, where consumers can conveniently access comprehensive information, including policy guidelines (Lupton, 2016). Additionally, this section should provide users with options to disable certain functions that involve sharing their data with third parties. By doing so, users are granted a sense of control over their personal information. In situations where the app encompasses sensitive consumer data, the inclusion of password protection can prove valuable in reducing users' perceived risks.

5.4 Research Limitations

This research successfully achieved its objectives and yielded valuable findings; it is crucial to acknowledge certain inherent limitations. It is important to address the gender distribution within the sample, as it was not balanced. Specifically, the interviewees consisted of four women and only two men. This gender imbalance does not indicate a lot of valuable insights about men. Men and women have different fitness standards and different goals. For instance, men want to be more muscular which means that they follow an intense exercise routine and high-protein eating habits. On the contrary, women want to look slimmer, so they will follow an eating routine with low calories and not-so-intense exercising. The different standards between women and men occur in different findings and outcomes, such as more intense exercising, higher levels of goals to be achieved, and more obsessive behavioral traits. Those could lead to more conflicting emotions and different coping strategies.

Additionally, the age range of the respondents was between 20 and 24. Furthermore, since only one age group was examined, it is important to note that the research results may not be directly applicable to other age categories such as 50 or 60 who may find it more difficult to cope with the app and new technologies. So, it is worth noting that the group of respondents can be classified as digital natives, assuming a fundamental understanding of smart devices. Therefore, this research is based on individuals who possess the necessary skills and knowledge to utilize digital technologies, and the results may not be generalizable to individuals who lack these

competencies. Furthermore, the research does not differentiate between different adopter groups, which may exhibit distinct characteristics as outlined (Rogers, 1995). The different age ranges of respondents will have different outcomes, older users may find it more difficult to cope with new technologies and apps which will cause more conflicting emotions, different experiences, and concerns.

The majority of participants were Greek native speakers with academic backgrounds. Given that the study focused on five Greek respondents and one Italian respondent, caution should be exercised when generalizing these findings to other cultures and ethnicities. It is worth noting that there are many differences such as weather conditions, eating habits, and different perspectives on exercising and fitness. For instance, in Greece, there are a lot of sunny days which is very encouraging for outdoor activities while in other countries such as the Netherlands in which the weather conditions are different indoor activities are more popular.

5.5 Future Research

Given the exploratory nature inherent in this study, a qualitative methodology was employed. Although this research design and its ensuing outcomes align with the intended objectives of this thesis, future investigations must expand upon these findings and corroborate them across diverse age cohorts and cultural contexts. Specifically, given the paucity of scholarly inquiry concerning mHealth applications, the research findings necessitate validation through quantitative inquiry and additional empirical investigations.

Furthermore, this research illuminates the propensity of respondents towards obsessive inclinations concerning self-control. An intriguing avenue for inquiry lies in examining the specific user profiles that are particularly susceptible to developing compulsive behaviors, including an in-depth analysis of individual characteristics. Additionally, it warrants exploration to discern which types of apps and functionalities foster detrimental behaviors and to devise strategies for mitigating the emergence of obsessive tendencies. A comprehensive and meticulous analysis of individual characteristics is paramount to get to the heart of this. These could range from socio-demographic factors such as age, gender, and educational background to more intrinsic ones like psychological traits, personal histories, and even genetic predispositions. Beyond the user-specific insights, there's another layer of this study that demands attention. It's essential to discern which applications and their specific features or

functionalities might be inadvertently promoting or triggering detrimental behaviors in users.

Another pertinent area for future investigation pertains to privacy concerns, specifically elucidating the user segments displaying heightened apprehension and skepticism regarding data security. Given that the current study encompasses only a limited selection of mHealth apps, an intriguing avenue of exploration lies in investigating the generalizability of the findings to other app categories, particularly those intended for medical purposes, such as the utilization of mHealth apps by individuals with chronic conditions. It's worth noting that the scope of the current study primarily focuses on a select range of mHealth apps. While these findings provide valuable insights, it's vital to consider their broader applicability. A compelling direction for subsequent research would be to examine whether these observations and conclusions can be generalized across other app categories.

6. Conclusion

This Master's thesis explores consumer behavior after technology adoption. It contributes to science by applying and expanding the concept of user experience to the innovative domain of mHealth apps. Qualitative research was applied to explore the user's positive and negative experiences that arise in the domain of mHealth apps and how they affect the consumer. The findings demonstrate that mHealth app usage can indicate positive experiences but mostly negative experiences which lead the users to apply coping strategies to deal with them. Some of the negative emotions that arise through the research are sadness, guilt, and disappointment. Users to deal with those feelings arise some coping mechanisms, the most applicable adjusting and comforting. Taking into consideration the limited literature and research on mHealth apps it can end up in a risky uncertain field. The findings are relevant for several actors, such as app developers, health insurance companies, public policymakers, and, consumers to be conscious of the effects that the apps have on them.

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Appendices

Appendix A

Introduction to the questionnaire:

Firstly, we want to thank you for your interest in participating in a research project for the Master Marketing students' thesis. The thesis focuses on user experiences with mHealth applications, which are used to measure behaviors such as step tracking, food monitoring, and workout schedules mainly for motivational reasons. These applications can be used on smartphones and smartwatches. The researchers will use a diary study to collect data about user behavior, activities, and experiences over time. Respondents will share their experience with a mHealth application of their choice daily through spoken diaries based on a set of questions for 14 days. To prevent forgetfulness in recording diaries, the researchers will send random reminders during the day.

Respondents will discuss their daily experiences in a diary using a questionnaire. The same questionnaire will be used throughout the entire period, and it's important to keep this list handy when recording the diary. Respondents don't have to name the question during recording, but they should name three segments (general usage, emotions, and future usage) for clarity. When sharing experiences with multiple mHealth applications, respondents should mention which application is being referred to so researchers can understand which experience belongs where. Respondents can use their phone's dictaphone to record the diary in their native language. At the end of each day, recordings will be sent via WhatsApp with end-to-end encryption ensuring safe transmission. Only respondents and researchers will have access to listen to recordings within chat; all responses are anonymous.

For selecting respondents, the researchers created a questionnaire to gather more information. Participation in this study is voluntary and participants can withdraw at any time.

Questionnaire for the selection of the participants for the diary study:

Demographic questions:

1. What is your gender?
    a. Female
    b. Male
    c. Non-binary
    d. D.Prefer not to answer
2. What is your nationality?
3. What is your educational level?
4. What is your profession?

mHealth application usage questions:

1. Do you currently use a mHealth application?

If yes:

~~2.~~ Which mHealth application(s) are you using~~?~~
3. Why did you start using it?
4. For how long have you been using it?

How often do you use this mHealth app?

Transcription in Greek

Εισαγωγή στο ερωτηματολόγιο:

Πρώτον, θα θέλαμε να σας ευχαριστήσουμε για το ενδιαφέρον σας να συμμετάσχετε σε ένα ερευνητικό πρόγραμμα για τη διπλωματική εργασία των φοιτητών του μεταπτυχιακού μάρκετινγκ. Η διπλωματική εργασία επικεντρώνεται στις εμπειρίες των χρηστών με εφαρμογές mHealth, οι οποίες χρησιμοποιούνται για τη μέτρηση συμπεριφορών όπως η παρακολούθηση βημάτων, η παρακολούθηση της

διατροφής και τα προγράμματα προπόνησης κυρίως για λόγους παρακίνησης. Οι εφαρμογές αυτές μπορούν να χρησιμοποιηθούν σε smartphones και smartwatches. Οι ερευνητές θα χρησιμοποιήσουν μια μελέτη ημερολογίου για τη συλλογή δεδομένων σχετικά με τη συμπεριφορά, τις δραστηριότητες και τις εμπειρίες των χρηστών με την πάροδο του χρόνου. Οι ερωτηθέντες θα μοιράζονται καθημερινά την εμπειρία τους με μια εφαρμογή mHealth της επιλογής τους μέσω προφορικών ημερολογίων με βάση ένα σύνολο ερωτήσεων για 14 ημέρες. Για να αποφευχθεί η λήθη στην καταγραφή των ημερολογίων, οι ερευνητές θα στέλνουν τυχαίες υπενθυμίσεις κατά τη διάρκεια της ημέρας.

Οι ερωτηθέντες θα συζητήσουν τις καθημερινές τους εμπειρίες στο ημερολόγιο χρησιμοποιώντας ένα ερωτηματολόγιο. Το ίδιο ερωτηματολόγιο θα χρησιμοποιηθεί καθ' όλη τη διάρκεια της περιόδου και είναι σημαντικό να έχετε αυτή τη λίστα πρόχειρη κατά την καταγραφή του ημερολογίου. Οι ερωτηθέντες δεν χρειάζεται να ονομάσουν την ερώτηση κατά την καταγραφή, αλλά θα πρέπει να ονομάσουν τρία τμήματα (γενική χρήση, συναισθήματα και μελλοντική χρήση) για λόγους σαφήνειας. Όταν μοιράζονται εμπειρίες με πολλαπλές εφαρμογές mHealth, οι ερωτώμενοι θα πρέπει να αναφέρουν σαφώς σε ποια εφαρμογή αναφέρονται, ώστε οι ερευνητές να μπορούν να καταλάβουν ποια εμπειρία ανήκει πού. Οι ερωτηθέντες μπορούν να χρησιμοποιήσουν το μικρόφωνο του τηλεφώνου τους για να καταγράψουν το ημερολόγιο στη μητρική τους γλώσσα. Στο τέλος κάθε ημέρας, οι ηχογραφήσεις θα αποστέλλονται μέσω Whatsapp με κρυπτογράφηση από άκρο σε άκρο που θα διασφαλίζει την ασφαλή μετάδοση. Μόνο οι ερωτηθέντες και οι ερευνητές θα έχουν πρόσβαση στην ακρόαση των ηχογραφήσεων στο πλαίσιο της συνομιλίας- όλες οι απαντήσεις είναι ανώνυμες.

Για την επιλογή των ερωτηθέντων, οι ερευνητές δημιούργησαν ένα ερωτηματολόγιο για τη συλλογή περισσότερων πληροφοριών. Η συμμετοχή σε αυτή τη μελέτη είναι εθελοντική και οι συμμετέχοντες μπορούν να αποσυρθούν ανά πάσα στιγμή.

Ερωτηματολόγιο για την επιλογή των συμμετεχόντων στη μελέτη ημερολογίου:
Δημογραφικές ερωτήσεις:

1. Ποιο είναι το φύλο σας;

a. Γυναίκα

b. Άνδρας

c. Μη δυαδικό

d. Προτιμώ να μην απαντήσω

2. Ποια είναι η εθνικότητά σας;

3. Ποιο είναι το μορφωτικό σας επίπεδο;

4. Ποιο είναι το επάγγελμά σας;

Ερωτήσεις χρήσης εφαρμογών mHealth:

1. Χρησιμοποιείτε επί του παρόντος κάποια εφαρμογή mHealth;

Εάν ναι:

2. Ποια(-ες) εφαρμογή(-ες) mHealth χρησιμοποιείτε;

3. Γιατί αρχίσατε να τη χρησιμοποιείτε;

4. Για πόσο καιρό τη χρησιμοποιείτε;

Πόσο συχνά χρησιμοποιείτε αυτή την εφαρμογή mHealth;

Appendix B

Introduction to daily questions

Below are the questions for the diary study that must be answered daily for 14 days. The questions will remain consistent throughout the period. At the end of each day, please answer these questions in a voice recording. It's important to say everything that comes to mind in this recording, without naming the question. However, to keep the diary clear for researchers, it's essential to name three segments (general experience of usage, emotions, and coping strategies) during your recording. Coping Strategies refer to actions taken by people dealing with negative emotions like stress or anxiety while using mHealth applications.

When sharing experiences with multiple mHealth applications, clearly mention which application is relevant beforehand so researchers can understand which

experiences belong where. If you don't use any mHealth applications on a given day, still record your responses and explain why you didn't use them that day.

Use your mobile device's dictaphone app to record your diary entries and send them via WhatsApp to our research team. To allow respondents the best expression possible, they may answer in English or their native language as agreed upon during the selection of participants.

General experience of usage

What and how were your experiences with mHealth applications today?

Emotions

What negative or positive emotions did you experience while using the mHealth application?

Why do you think you felt this way?

Coping strategies

If you experienced any negative emotions, how did you cope with them?

Why did you choose to cope in this way?

How did your way of coping make you feel afterward?

Transcription in Greek

Εισαγωγή στις καθημερινές ερωτήσεις

Ακολουθούν οι ερωτήσεις για τη μελέτη ημερολογίου που πρέπει να απαντώνται καθημερινά επί 14 ημέρες. Οι ερωτήσεις θα παραμείνουν σταθερές καθ' όλη τη διάρκεια της περιόδου. Στο τέλος κάθε ημέρας, παρακαλούμε να απαντάτε σε αυτές τις ερωτήσεις σε μια ηχογράφηση φωνής. Είναι σημαντικό να λέτε ό,τι σας έρχεται στο μυαλό σε αυτή την ηχογράφηση, χωρίς να κατονομάζετε την ερώτηση. Ωστόσο, για να είναι σαφές το ημερολόγιο για τους ερευνητές, είναι σημαντικό να αναφέρετε τρία τμήματα (γενική εμπειρία χρήσης, συναισθήματα και στρατηγικές αντιμετώπισης) κατά τη διάρκεια της ηχογράφησής σας. Οι στρατηγικές αντιμετώπισης αναφέρονται σε ενέργειες που λαμβάνουν τα άτομα που αντιμετωπίζουν αρνητικά συναισθήματα όπως το άγχος ή το στρες κατά τη χρήση εφαρμογών mHealth.

Όταν μοιράζεστε εμπειρίες με πολλαπλές εφαρμογές mHealth, αναφέρετε εκ των προτέρων με σαφήνεια ποια εφαρμογή είναι σχετική, ώστε οι ερευνητές να μπορούν να καταλάβουν ποιες εμπειρίες ανήκουν πού. Εάν δεν χρησιμοποιείτε καμία εφαρμογή mHealth σε μια δεδομένη ημέρα, εξακολουθείτε να καταγράφετε τις απαντήσεις σας και να εξηγείτε γιατί δεν τις χρησιμοποιήσατε εκείνη την ημέρα.

Χρησιμοποιήστε την εφαρμογή ηχογράφου της κινητής σας συσκευής για να καταγράψετε τις ημερολογιακές σας εγγραφές και να τις στείλετε μέσω Whatsapp στην ερευνητική μας ομάδα. Για να μπορέσουν οι ερωτώμενοι να εκφραστούν όσο το δυνατόν καλύτερα, μπορούν να απαντήσουν στα αγγλικά ή στη μητρική τους γλώσσα, όπως συμφωνήθηκε κατά την επιλογή των συμμετεχόντων.

Γενική εμπειρία χρήσης

Ποιες και πώς ήταν οι εμπειρίες σας με τις εφαρμογές mHealth σήμερα;

Συναισθήματα

Ποια αρνητικά ή θετικά συναισθήματα βιώσατε κατά τη χρήση της εφαρμογής mHealth;

Γιατί νομίζετε ότι αισθανθήκατε έτσι;

Στρατηγικές αντιμετώπισης

Εάν βιώσατε αρνητικά συναισθήματα, πώς τα αντιμετωπίσατε;

Γιατί επιλέξατε να τα αντιμετωπίσετε με αυτόν τον τρόπο;

Πώς σας έκανε ο τρόπος αντιμετώπισης να νιώσετε μετά;

Appendix C

a. Positive Experience

FIRST ORDER	DEFINITION	EXAMPLE QUOTE
Satisfaction	Fulfillment of one's wishes, expectations, or needs	Imagine me saying to myself "Good for you girl"- R1
Pride	The feeling of deep pleasure derived	“I did surprisingly well, breaking every

	from one's achievements	record of the previous days"- R3
Happy - Glad	Feeling or showing contentment.	"Happy to achieve the goal with no pressure" -R2
Surprised	Experiencing an unexpected good feeling	"The truth is that I wouldn't have realized that I had taken so many steps without it"-R3
Motivated	Something that stimulates a person to act and behave to achieve a desired goal	"The goal was again 8000 steps….and I think that I will set the everyday step goal to 11.000… I will change my step goal and I hope that I will be able to achieve it"- R7

b. Negative experience

FIRST ORDER	DEFINITION	EXAMPLE QUOTE
Sad	Feeling unhappy or showing unhappiness	"Because I didn't achieve the goal"-R1
Feel bad- remorse	Feeling deep regret or sadness	"There was no time to walk" -r1
Guilty	It is easily chargeable with a particular fault or error.	"I'm not feeling ok because I had the time to do it and I didn't" -r3,r2
Bored	Lacks interest in one's current activity	"I had time but I didn't want to go out" -r2
Disappointed	Displeased because something has failed to fulfill one's hopes or expectations	"I was expecting more steps and burned calories" -r4, r2
Ashamed-embarrassed	feel guilty because of something they do	"This is so embarrassing"-r7
Shocked	The experience of negative surprise	"I was like wow there are only 1000 steps"-r7

Appendix D

Coping strategies

FIRST ORDER	DEFINITION	EXAMPLE QUOTE
ADJUSTING	Adapting certain behaviors to relieve tensions	"I will walk more tomorrow"- R4
COMFORTING	Justifying a situation or action to release feelings of stress	"I will consider this a rest day" – R1