EHEALTH APPS IN WORKPLACE HEALTH MANAGEMENT – AN ANALYSIS OF DETERMINANTS AND EFFECTS ON EMPLOYEE HEALTH

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EHEALTH APPS IN WORKPLACE HEALTH MANAGEMENT – AN ANALYSIS OF DETERMINANTS AND EFFECTS ON EMPLOYEE HEALTH

Research in Progress

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Abstract
Organisations are increasingly investing in workplace health-promotion measures such as eHealth applications to improve employees’ well-being. Nonetheless, missing research on how different factors influence the adoption of such applications hinders efficient implementation. Therefore, we first examine how the individual factors attitude towards eHealth application, perceived stress (assessed in dimensions joy, tension, demands, and worries), resilience, and work-life balance relate to employees’ intention to use. Second, we investigate how team-level factors influence the adoption process by including social support from colleagues and supervisors as determinants of actual use. Third, the effects of eHealth application use on employees’ physical health are explored. Preliminary results based on multiple regression analysis show that the chosen factors can predict use intention. The final study will contribute to understanding the overall adoption process, including several physical-health-related outcomes, and thereby support an effective and target-group-specific implementation of eHealth applications.

Keywords: eHealth application, Workplace, Stress, Social support, Physical health.

1 Introduction

Work represents the number one stress factor (Rose et al., 2017). Stress is multifaceted and can pose a negative impact on employees’ mental and physical health (Stier-Jarmer et al., 2016). High levels of stress can lower productivity and lead to mental illnesses, which have become a major factor in work incapacity. Because this can result in considerable financial losses for organisations (Hassard et al., 2018), most of them are increasingly investing in workplace health promotion (WHP) to counteract stress and improve employees’ health. This includes the provision of eHealth, that is, “health services and information delivered or enhanced through the Internet and related technologies” (Eysenbach, 2001, p. 1). More specifically, in this study, eHealth is referred to as applications that provide general public advice or exercises in different health areas, such as mental and physical health or nutrition. Such tools are effective WHP measures for reducing stress (Stratton et al., 2017). Nevertheless, participation rates in WHP programmes are low (Robroek et al., 2009). This raises the questions of how perceived stress and related individual factors are linked to eHealth app use in WHP and how its adoption can be supported. The lack of research in this area impedes organisations from reaching the right target group and spending the WHP budget efficiently.

Thus, this study aims, first, to identify the right target group of eHealth initiatives within WHP by examining how different individual factors are related to the intention to use eHealth tools and, second, to explore how team-level factors are related to actual usage behaviour. Not only can stress lead to
mental health issues, but it may also be linked to employees’ active engagement in health-promoting
measures. Therefore, this study focuses on factors relating to how employees perceive and manage stress
as well as the support they receive from different levels and combine these with established relationships
between attitude towards use, intention to use, and actual use. In the first step, the study examines how
employees’ perceived stress, resilience, and work-life balance are related to the intention to use an
eHealth app. Stress is a multifaceted issue that consists of the dimensions of joy, tensions, demands, and
worries (Fliege et al., 2005). For a detailed understanding, we do not consider the effects of the single
(second-order) construct but rather investigate the influences of its dimensions separately. In the second
step, the study investigates the intention-behaviour gap. An unsupportive environment may prevent
employees from using an eHealth app, even though they initially intended to (Krick et al., 2019). Thus,
the influence of social support from supervisors and colleagues on actual use is examined. Taken
together, this study aims to analyse the influence of potential determinants of intention to use and actual
use of eHealth apps in WHP. This leads to the following research questions:

1) How do the employees’ individual factors of attitude towards an eHealth app, perceived stress,
personal resilience, and work-life balance influence the intention to use an eHealth app?
2) What impact do the team-level factors of social support from supervisors and colleagues have
on the actual use of an eHealth app?

To add more value to the findings, in a third step, the study additionally evaluates the impacts of eHealth
app use on the physical health of employees and thus addresses the third research question:

3) Does a four-month use of an eHealth app improve physical health parameters such as athletic
endurance, body-fat percentage, and blood values?

To address these research questions, employees who were a part of a professional WHP seminar in a
German organisation will be studied. Within the seminar, participants are introduced to an eHealth app.
The app provides personalized exercises in the areas of mental and physical health, which can be
conducted at the workplace, as well as advice on healthy nutrition. The entire adoption process is
assessed by ascertaining the variables at two points in time, four months apart. This allows for
investigation of the adoption process in a controlled environment, where all participants shared equal
organisational conditions. This short paper provides theoretical foundations, information on the
empirical procedure, and some preliminary answers to the first research question based on an already
completed pre-test.

2 Related Research

The field of eHealth deals with the use of technology, on the one hand, and with health behaviour, on
the other hand. Thus, it combines information systems research with medical research. The adoption of
eHealth apps has mainly been studied with samples consisting of the general public, medical staff, and
patients (Chauhan and Jaiswal, 2017). The majority of these studies applied established technology-
acceptance theories, such as the Technology Acceptance Model (TAM, Davis et al., 1989) and Unified
Theory of Acceptance and Use of Technology (UTAUT, Venkatesh et al., 2012). Meta-analytic results
support TAM relationships for eHealth adoption (Chauhan and Jaiswal, 2017). Besides, factors such as
perceived vulnerability and perceived severity that originate from health behaviour theories such as
Rogers’ (1975) Protection Motivation Theory (PMT) have been found to be related to eHealth use (Gao
et al., 2015).

By contrast, little is known about eHealth adoption in an occupational context. While eHealth use within
WHP is also an individual decision, it differs from other contexts as the decision to use is made by
individuals in an environment shaped by organisational dynamics, complex interactions, management
strategies, and actions (Frambach and Schillewaert, 2002; Leonard-Barton and Deschamps, 1988;
Lucas, 1978). Hence, the role of individual and social factors needs to be specifically examined in the
occupational context (Frambach and Schillewaert, 2002). Stress is a major health concern for employees
and can be reduced by the use of eHealth tools (Stratton et al., 2017); nevertheless, the influence of
stress and related factors on eHealth use has only been addressed by a few studies within (Billings et al.,
2008; Hasson et al., 2010) and outside organisations (Apolinário-Hagen et al., 2019; Hennemann et al., 2016). These studies have yielded different and partly ambiguous results. Other potential determinants of eHealth use that have been studied in the organisational context include physical health (Robroek et al., 2012), lifestyle (Hasson et al., 2010), and social influence (Hennemann et al., 2016; Park et al., 2020).

A detailed understanding of the entire adoption process, including different levels as recommended by Venkatesh et al. (2016), is missing. This also concerns the effects of eHealth use on employee health. Many studies have found that eHealth interventions in WHP can reduce depression, anxiety, and stress (Stratton et al., 2017). Although stress harms not only mental health but also physical health, research on the effects of eHealth interventions on physical health is limited.

3 Research Model

3.1 Technology Acceptance

Similar to established theories around technology acceptance, such as TAM and UTAUT, this study follows a two-step approach. First, determinants of intention to use and second determinants of actual use are examined. In doing so, the basic relationships between attitude towards use, intention to use, and actual use are included (Fishbein and Ajzen, 1975). To consider the occupational context, we further integrate factors that address different organisational levels (Venkatesh et al. 2016) by including individual factors and social processes, as recommended by Frambach and Schillewaert (2002). In the first step, we study the relationship between individual-level factors and intention to use to identify the right target group. As predecessors of intention to use, we examine—besides attitude towards eHealth app use—personal resilience and work-life balance as factors that relate to how employees perceive and manage stress as well as the stress dimensions: joy, tension, demands, and worries. In the second step, we consider social processes in the organisation and thereby explore how team-level factors influence the actual use of the eHealth app to consider the entire adoption process. As a supportive environment may be an important factor (Krick et al., 2019) because of the social processes in an organisation, we explore how team-level factors influence the actual use of the eHealth app. We propose social support by supervisors and social support from colleagues as determinants of actual usage, next to use intention.

Many technological contexts have shown that a more positive attitude towards a certain technology is positively related to the intention to use it (King and He, 2006). This relationship has also been confirmed for attitudes towards eHealth apps across patients, medical staff, and the general public (Chauhan and Jaiswal, 2017). In WHP, the eHealth app is first adopted by the organisation before employees evaluate their individual-use decisions. This means that while, for private use, individuals can choose their favourite eHealth app, for the use within WHP, companies provide a specific app regardless of individual preferences. This app may not match an employee’s preferences and, hence, may not be regarded as beneficial. As follows, if employees do not think that the use of the eHealth app is useful and beneficial for them and have a less positive attitude towards it, they will not intend to use it, and vice versa. Thus, individuals’ attitudes towards eHealth apps may also be an important determinant of intention to use in the organisational context. Hence, we propose the following:

H1: Attitude towards an eHealth app is positively related to the intention to use that eHealth app.

The effects of perceived stress on participation in eHealth interventions have been investigated in several studies, yet with mixed results. For example, Apolinário-Hagen et al. (2019) found that higher levels of stress were positively associated with intention to use eHealth tools, while Hennemann et al. (2016) found the opposite, and other studies did not find significant effects (Hasson et al., 2010). According to PMT, individuals that are more susceptible to threat are more likely to engage in health-promoting behaviour (Rogers, 1975); that is, they use eHealth apps in WHP programmes. Stress may influence the assessment of threat, in that it increases perceived threat as it acts as an indicator of symptom severity (Apolinário-Hagen et al., 2019). Thus, stress may lead to a stronger intention to use...
eHealth tools to improve health. Stress is multifaceted and can be felt in different ways: less joy, more and greater worries, increased tension, and excessive demands (Fliege et al., 2005). These reactions to stress may relate differently to symptom severity and perceived threat. Unlike previous studies, this study, therefore, investigates the effects of the different dimensions of stress on the intention to use an eHealth app in WHP. Following the argument that higher levels of stress—that is, lower levels of joy and higher levels of worries, tension, and demands—may be associated with greater threat, a higher level of joy may be associated with lower intention to use. Furthermore, higher levels of tension, worries, and demands may be linked to higher intention to use. Thus, we hypothesise the following:

H2a–d: a) Higher levels of joy are negatively related to the intention to use an eHealth app, while higher levels of b) tension, c) demands, and d) worries are negatively related to the intention to use an eHealth app.

Resilience refers to positive adaptation when exposed to severe threats or adversity (Luthar et al., 2000). Higher levels of personal resilience may be linked positively to the intention to use an eHealth app in two ways. First, individuals with higher levels of resilience can better cope with stress (Campbell-Sills and Stein, 2007) and are less prone to feel threatened in stressful situations. Following PMT, as they perceive less threat, individuals with higher resilience are less likely to engage in health-promoting behaviours (Rogers, 1975). Besides, we argue that less resilient employees experience poorer health and thus are more likely to participate in eHealth than employees with better health status. According to Connor and Davidson (2003), resilience is negatively associated with mental illness. This suggests that more resilient people are in better health conditions. In contrast to previous studies in other areas of health promotion that have found that individuals with a healthier lifestyle are more likely to engage in health programmes (Lewis et al., 1996; Robroek et al., 2012), studies focusing on eHealth have shown that less healthy individuals are more likely to use eHealth tools (Bundorf et al., 2004; Reinwand et al., 2015). Less healthy individuals want to reach a better state of health and a better quality of life (Reinwand et al., 2015). Accordingly, employees in a poorer state of health, that is, employees with lower levels of resilience, would be more likely to have a greater demand for health information as they benefit more than employees who experience better health (Bundorf et al., 2004). Nevertheless, less resilient employees might feel uncomfortable with themselves and with engaging in health-promoting activities in person (Bregenzer et al., 2019; Hilliard et al., 2014), which might keep them from doing this. For such employees, online programmes offer an anonymized (Amichai-Hamburger et al., 2002; Bregenzer et al., 2019; Correa et al., 2010) and an uncomplicated option to gather information and obtain health guidance (Reinwand et al., 2015). Consequently, employees with a higher level of resilience will have a lower intention to use an eHealth app in WHP programmes. Hence, we propose the following:

H3: Resilience is negatively related to intention to use an eHealth app.

Work-life balance means that the balance perceptions that an individual subjectively strives to are in line with its realised life situation. This can concern roles, goals, and different areas of life (Kalliath and Brough, 2008). Individuals who are satisfied with their work-life balance are successful in balancing their work life and other areas in life, such as family, sports, and relaxation. Individuals with a poor work-life balance, by contrast, do not feel well-adjusted and content. Thus, they may be more likely to sense the need to take additional measures to achieve the desired balance, for example, through the use of an eHealth app in WHP. In addition, individuals with a poor work-life balance often have poor physical and mental health (Haar et al., 2014). Following the previous argument, employees experiencing a better work-life balance may feel less need for health and work-life improvement (Reinwand et al., 2015) and thus are less likely to intend to use an eHealth app in WHP. Thus, we propose the following:

H4: Work-life balance is negatively related to the intention to use an eHealth app.

We have proposed attitude, stress, resilience, and work-life balance as potential determinants of the intention to use an eHealth app within WHP programmes. In the following, we focus on the determinants of actual use and argue that, besides intention to use, social support by supervisors and colleagues may be essential in determining the actual use of eHealth apps in WHP programmes. The influence of similar
constructs, such as social influence, have been identified as important predictors of the intention to use an eHealth tool (Gao et al., 2015) also in the context of WHP programmes (Hennemann et al., 2016; Park et al., 2020). While social influence involves meeting the expectations of others regarding a behaviour (Fishbein and Ajzen, 1975), social support refers to activities that assist individuals in achieving their desired goal (Caplan et al., 1976). Social support is a critical determinant for participating in health-promoting behaviours (Dishman et al., 1985) and web-based interventions (Robroek et al., 2012). In general, social support—for example through encouragement and reminders—can motivate individuals to put their plans into action (Kruck et al., 2019). For health promotion at the workplace, social support from colleagues and superiors may be decisive factors. Social support from colleagues and supervisors may influence actual use through different mechanisms. Superiors have the hierarchical power to support eHealth use. Thus, they can encourage use by, for example, planning the distribution of tasks in a way that enables eHealth to be an integral part of employees’ daily work. Social support from colleagues, meanwhile, influences employees at the horizontal level. Through mutual support from colleagues, a cultural environment can be created that promotes eHealth participation. By contrast, lack of encouragement and reminders, as well as criticism of eHealth participation from colleagues and supervisors, can discourage employees from participating. Hence, we propose the following:

H5: The intention to use an eHealth app is positively related to the actual use of an eHealth app.

H6a-b: Social support from a) supervisors and b) colleagues is positively related to actual use of an eHealth app.

### 3.2 Effects of eHealth Use on Employees’ Health

Although eHealth tools promote physical activity (Davies et al., 2012), the effects of eHealth use on physical health are widely under-addressed as compared to mental health. The eHealth app used for the study offers demand-oriented exercises for different focal points (e.g., metabolic kick, inner peace) as well as personalised workouts and advice on nutrition. This includes short exercises and workouts that can be easily performed in the workplace. By using the app, employees are expected to exercise more and follow a healthier diet, thus achieving a better physical health status (Cook et al., 2007). This is linked to improved physical fitness, body composition, and blood values (Eklund et al., 2016). More precisely, this may lead to higher athletic endurance, measurable as maximal oxygen uptake (VO2max; Evans et al., 2015), healthier body composition in the form of a decrease in body fat (Manolopoulos et al., 2010), and better blood values in the form of lower levels of low-density lipoprotein (LDL) cholesterol (Maher, 1995). Therefore, we hypothesise the following:

H7a-c: The use of the eHealth app will lead to a) an increase in VO2max and a decrease in b) body fat and c) LDL cholesterol.

![Figure 1. Proposed research model.](image-url)
4 Empirical Study

4.1 Design and Participants

The study is conducted in cooperation with a medical laboratory that offers seminars in the area of WHP to companies. The data collection proceeds in two waves within the scope of a seminar series in a large public company in Germany: in the first part of the seminar (t1), participants are provided with access to the eHealth app and are introduced to the various features it offers in the areas of sports and exercise (e.g., training schedule, workout video tutorials), mental health (e.g., meditation, sleep affirmation), and nutrition (e.g., nutrient guide, customised recipes). By specifying personal goals in the app, individual plans are derived for the user, and the corresponding daily targets are provided in the areas of sports and exercise, mental health, and nutrition. After the introduction of the app, the participants are surveyed with the first questionnaire on their attitude towards and their intention to use the eHealth app. In addition, psychological assessments of personal resilience, perception of stress, work-life balance, and laboratory medical examination to determine various blood parameters and sports medical performance diagnostics are conducted. In the second part of the seminar four months later (t2), the laboratory medical and sports medical examinations are repeated to determine changes and thereby the effectiveness of the eHealth app use. In the second questionnaire, the actual use of the eHealth app and the social support from supervisors and colleagues is surveyed. The self-reported behaviour of the participants can be verified using app usage data. As part of a pre-test, 16 subjects completed the questionnaire during the first survey wave. All questionnaires were filled out completely, and the control question was answered correctly so that no subject was removed from the sample. All participants had German citizenship and worked full-time in a public company. Twelve persons practiced their occupational activity predominantly sitting, one overall balanced, and three predominantly standing. On average, participants exercised 4.75 h per week. Of the underlying sample, two participants (12.5%) were female, and the age structure (see Table 1; average age: 47) represents the age structure of employees in Germany (average age: 44; BIB, 2019).

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<td>2</td>
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<td>1</td>
<td>4</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 1. Age distribution of participants.

4.2 Measurements

All variables are assessed using established scales, which have been validated in previous studies. The questions were measured following the respective validation on Likert scales ranging from four to seven points. The following scales were included in the first questionnaire (t1): Intention to use was measured on a four-item scale (Venkatesh et al., 2012; 7-point Likert scale, Cronbach’s alpha (α) = .878, average variance extracted (AVE) = 0.733). To measure attitude towards the eHealth application, we built on a four-item scale from Fathema et al. (2015; 5-point Likert scale, α = 0.723, AVE = 0.653; one item dropped). Resilience was measured using a scale originally developed by Connor and Davidson (2003) and validated as a 10-item scale by Campbell-Sills and Stein (2007; 5-point Likert scale, α = 0.898, AVE = 0.587; two items dropped). For work-life balance, we refer to the five-item scale developed by Syrek et al. (2011; 6-point Likert scale, α = 0.863, AVE = .704). Perceived stress was measured in its four subdimensions on a 20-item and 4-point Likert scale with worries (α = 0.767, AVE = 0.521), tensions (α = 0.884, AVE = 0.746), joy (α = 0.875, AVE = 0.627), and demands (α = 0.707, AVE = 0.538; one out of five items dropped) using PSQ-20 (Fliege et al., 2005). All factor loadings exceed .60 and, therefore, show acceptable values (Hair et al., 2016). The pre-test revealed adequate internal consistency and composite reliability for each measurement since α met the quality criteria of >0.7, and the AVE exceeded 0.5 (Hair et al., 2016). The evaluation of correlations showed that multicollinearity...
was not present for most constructs. As control variables, we included the demographic variable age, activity type (5-point continuum from sitting to standing), and physical activity hours per week.

5 Preliminary Results

To test the first part of the proposed research model (H1–H4) using the results of the pre-test, multiple linear regression with SPSS 26 was performed. Since the variables were measured on Likert scales with different numbers of points, z-standardization was performed. Durban–Watson indicates little autocorrelation, with a value of 1.177. The standardised path coefficients and significance levels are listed in Table 2. The model consisting of attitude, perceived stress in its four subdimensions, resilience, and work-life balance was able to predict statistically significant the intention to use the eHealth app, $F(5, 10) = 8.808, p = .013$. Evaluating the overall model, we found that the data fit well for the intention to use the eHealth app with an adjusted $R^2$ of 0.839.

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Predictor</th>
<th>$\beta$</th>
<th>p</th>
<th>Assessment of hypotheses</th>
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<tr>
<td>H1</td>
<td>Attitude</td>
<td>.644 (.215)</td>
<td>.030</td>
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<td>H2a</td>
<td>Stress-joy</td>
<td>.674 (.313)</td>
<td>.084</td>
<td>Rejected</td>
</tr>
<tr>
<td>H2b</td>
<td>Stress-tensions</td>
<td>.466 (.432)</td>
<td>.330</td>
<td>Rejected</td>
</tr>
<tr>
<td>H2c</td>
<td>Stress-demands</td>
<td>-.195 (.209)</td>
<td>.395</td>
<td>Rejected</td>
</tr>
<tr>
<td>H2d</td>
<td>Stress-worries</td>
<td>.340 (.361)</td>
<td>.390</td>
<td>Rejected</td>
</tr>
<tr>
<td>H3</td>
<td>Resilience</td>
<td>-.457 (.185)</td>
<td>.056</td>
<td>Supported</td>
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<tr>
<td>H4</td>
<td>Work-life balance</td>
<td>-.264 (.339)</td>
<td>.153</td>
<td>Rejected</td>
</tr>
<tr>
<td>Controls</td>
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<td>.201</td>
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</tr>
<tr>
<td></td>
<td>Activity type</td>
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<td>.410</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hours of physical activity</td>
<td>-.032 (.247)</td>
<td>.906</td>
<td></td>
</tr>
</tbody>
</table>

*Note. $\beta =$ standardised path coefficients; standard error of the estimators in parentheses. Assessment of the hypotheses based on the cut-off value of $p = .1$. Table 2. Results of multiple linear regression analysis.*

6 Discussion

Overall, the pre-test shows that the measurement models of the first part of the research model perform well and are appropriate for predicting the intention to use. The preliminary results support our propositions of a positive relationship between employees’ attitudes towards the eHealth app and the intention to use the eHealth app in WHP (H1) as well as a negative relationship between employees’ resilience and usage intention (H3). The analysis of the relationship between perceived stress and employees’ intention to use the eHealth app only resulted in significant results for the dimension of joy. Contrary to what was expected, this effect was positive. The basis for the assumption of a negative effect was that, as a dimension of stress, a lack of joy may be an indicator of symptom severity. Symptom severity signals to individuals the seriousness of their condition and induces them to engage in health-promoting behaviour (Rogers, 1975). The observed positive effect, however, suggests that employees who perceive more joy may have a greater drive for action and thus a higher interest in using the eHealth app. Further, the results presage a negative relationship for perceived demands and positive relationships for worries and tensions. Though not significant, which may be due to the small sample size, these contrary effects provide an indication as to why previous studies have not found significant results for the relationship between perceived stress and participation in eHealth. This indicates that perceived stress should be analysed separately and not as a second-order construct to determine which stress reactions increase the intention to use eHealth apps in WHP. Due to the preliminary nature of these results and the small sample size, the results may not be robust and should be treated with caution. The small sample has little statistical power, meaning that only very large effect sizes could be identified as
significant, while smaller effect sizes show a high \( p \) value. After completion of data collection, we expect sufficient power to identify at least medium effect sizes (Cohen, 1988; Faul et al., 2007). Nevertheless, these findings show promising evidence of the relationship between stress and eHealth use.

7 Further Steps and Expected Contributions

While the preliminary results of this study provide promising insights for the overall project, a contract for ten seminars with 16 participants each was signed with the cooperating medical laboratory and the company where the pre-test data were collected. Therefore, it is expected that 160 additional participants will have taken part in our study by ECIS 2021. The first part of the seminar (t1 in the proposed research model), where attitude, perceived stress (joy, tension, demands, and worries), resilience, work-life balance, and intention to use the eHealth app are collected via the first questionnaire, will take place in January 2021. The second part of the seminar (t2) will take place in May 2021. Using the second questionnaire, the use behaviour will be surveyed and checked via app usage data. The social support of supervisors and colleagues is measured on a 6-item scale according to Sallis et al. (1987) with a 5-point Likert scale. The effectiveness of the use of the eHealth app is determined by measuring in t1 and t2 the maximum oxygen uptake (VO2max), body-fat percentage, and cholesterol as proxies for athletic performance, body composition and diet. VO2max is measured during a ramp test on a bike ergometer, whereby the power output to be performed by participants is increased by 20 W every 3 min using the Cyclus 2 ergometer, and the oxygen intake is measured via a MetaMax device (Bassett and Howley, 2000). The body-fat percentage was measured using a professional body-fat scale Tanita MC-780MA P (Jebb et al., 2000). Whole-blood samples are analysed for LDL cholesterol as part of a typical laboratory diagnostic (Maher, 1995). As outcome variables, the respective changes in the three variables from t1 to t2 are calculated.

Power analysis with G*Power 3.1 was performed to determine the required sample size for analysing the entire proposed research model, as illustrated in Figure 1 (Faul et al., 2007). To perform a conservative estimate, medium effect sizes (~.15) were assumed (Cohen, 1988). Using a two-tailed test with an alpha error of .05 and a power of .95, the projected minimum sample size required for the proposed research model was approximately \( N = 89 \). The proposed sample size for the follow-up study exceeded the requirements formulated by Hair et al. (2016). It is expected that the estimated minimum sample size will be significantly exceeded, as a total of 176 persons (16 in the pre-test and 160 in the following seminars) will participate in the seminars, which are strongly promoted by the company management by counting the employees’ participation in the seminars as working time. Besides, a high intrinsic motivation among the participants is expected, since the participants will gain significant knowledge about their health status quo, and assessment of such parameters is very costly. The pre-test also showed that the data of all seminar participants could be processed; therefore, no individual had to be excluded from the sample.

Although the final study will be prone to some limitations (e.g., the possible positive bias of intention to use and actual use due to existing interest in participating in WHP programmes, choice of indicators for physical health measurement, further factors influencing physical health outcomes, and potential cultural biases as the study is conducted only in Germany), it will shed light on the entire adoption process of eHealth apps in WHP programmes by combining psychological, medical, and sports scientific factors. We will provide evidence on the mechanisms that support and hinder the introduction of eHealth apps for WHP. In doing so, we show that facets of stress are differently related to usage intention. This can explain the mixed results of previous studies and help future studies to reach conclusive results. This study also has important implications for organisations. We will be able to offer specific recommendations regarding the effective implementation of eHealth apps in the context of WHP. In particular, the results will help organisations to target WHP measures towards the right employees and provide suitable advice to supervisors and colleagues in creating a supportive environment. This not only enables organisations to spend the budget for WHP efficiently but also helps to decrease financial losses due to reduced productivity or work incapacity caused by stress.
References


