

Assessing Mental and Physical Health-Related Lifestyle Behaviours: Enhancing the University of Twente's Lifestyle Check Questionnaire for Validity, Acceptance, and Comparison among UT Staff

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Abstract

This study aimed to enhance the University of Twente's (UT) lifestyle check intake questionnaire to assess mental health and physical health-related lifestyle behaviours among UT staff. Employing a mixed-methods design and co-creational approach, the study sought to identify valid measures based on empirical evidence and stakeholder preferences. UT staff scores on novel health indicators were compared with a reference sample, while exploring staff perceptions, acceptance levels, and factors influencing participation, including differences based on employment contracts. The study compared the scores of approximately one hundred UT staff members on the novel health indicators with scores from other staff groups. The analysis sought to investigate factors that may impact the levels of acceptance, employing questions rooted in the Unified Theory of Acceptance and Use of Technology (UTAUT). Additionally, the study explored possible variations in acceptance across different contract types. The findings showed significant differences in mean scores between the UT and reference samples, indicating lower stress levels and reduced risk for alcohol consumption among UT staff. A significantly lower level of physical activity was observed among UT staff. The results of the multiple regression analysis indicated that the items derived from the Unified Theory of Acceptance and Use of Technology (UTAUT) and employment contract types did not have a significant influence on the acceptance level (willingness to participate again).

This study contributed to the ongoing improvement of the UT lifestyle check intake questionnaire, enhancing its validity in measuring mental health and physical health-related lifestyle behaviours. To further enhance user acceptance and engagement, future research should consider implementing user-centred design principles and conducting usability testing to ensure the questionnaire meets the needs and preferences of the target population. Additionally, exploring detailed personalized feedback could potentially increase user motivation and participation. Continuous refinements of the questionnaire, guided by user feedback and evaluation, are recommended to optimize its utility and effectiveness.

Prefix

The "Well-being Action Plan" is one of the programs and guidelines the University of Twente has implemented to enhance employee well-being (Human Resources UT, 2023). The university has implemented a computerised questionnaire known as the "Lifestyle Check Questionnaire" as part of their efforts to evaluate its employees' physical and mental health and give suitable remedies. The "Lifestyle check" consists of a voluntary online survey that is completed, then a discussion with a lifestyle coach or physiotherapist. Additional treatments, such as referrals to doctors or psychologists, can be suggested in light of the findings and discussion. However, concerns have been raised about the suitability of the questionnaire for the university staff population. It lacks a validated and tested measurement tools to accurately assess the intended concepts and ensure reliability. Furthermore, the current selection of health topics in the questionnaire may not comprehensively capture all relevant dimensions of well-being. Some critical dimensions are missing from the assessment, as it focused on specific aspects such as nutrition, sleep, physical activity, stress, breathing, smoking, alcohol, and working time. The presence of ambiguous questions in the survey hampers quantitative analysis and comparison of individual scores. Therefore, improving the questionnaire to provide a more comprehensive view of employee well-being and collect accurate and informative data is crucial. The University of Twente has initiated a project to develop a new questionnaire based on scientific literature and validated for the staff population. This endeavour aimed to access current insights on employee well-being and tailor interventions accordingly, benefiting both employees and the organisation as a whole. This project aimed to enhance the existing questionnaire established by the University of Twente and develop a more valid tool for screening employee well-being and identifying risk factors for effective intervention.

Introduction

Well-being refers to a state of optimal physical, mental, and social health, and it is recognised as an important factor in individuals' ability to function effectively in both their personal and professional lives (Keyes, 2007). Numerous studies have shown that high levels of well-being are more productive, engaged, and satisfied with their jobs, and less likely to experience burnout (Bakker et al., 2008 & Judge et al., 2001). Negative well-being can have a significant impact on staff and their working attitude. A study by van der Beck et al. (2014) discovered a significant relationship between poor mental health and increased absenteeism and decreased productivity at work. This is further elaborated by Hennekam et al. (2020), who provide evidence that poor mental health affected absenteeism or productivity negatively and implicated self-perceived job performance, such as lower quality of work, slower pace, and increased errors. Participants reported difficulties in concentration and focus, fluctuating energy levels, being slower and more forgetful, resulting in lower quality of their work or services and a perception of reduced professionalism (Hennekam, Richard & Grima, 2020). Additionally, controlled research has shown that well-being improved cognitive functioning, creativity, and innovation, which are necessary for effective work performance (Fredrickson, 2001; Fredrickson & Branigan, 2005). Consequently, putting employee well-being first is crucial for building a productive workplace that encourages creativity, productivity, and job satisfaction. One way to address employees' well-being at work is to screen their physical, mental, and social health. Companies can take action early to give aid and resources to employees experiencing physical or mental health issues, avoiding negative consequences like absenteeism, productivity loss, and employee turnover (Henderson et al., 2005; Lerner & Henke, 2008). As previously said, well-being is a complex concept that incorporates many aspects of a person's existence. Thus, this study focused on two essential areas of well-being in this project: physical and mental well-being. Potential risk factors for well-being, such as nutrition, physical activity, sleep, smoking, stress, burnout and alcohol consumption, and pain to ensure a complete analysis of physical health and potential risk factors for future health problems, is examined.

It is widely accepted that physical activity substantially impacts a person's physical health and overall well-being (Harvey et al., 2018; Kouvonen et al., 2013). Stress has emerged as a significant mental health concern within the more highly educated health professional

population. Recognising its potential to give rise to various health complications, it is crucial not to overlook the impact of stress on overall well-being (Guruprakash, 2018). According to Sarris et al. (2015), there is growing and convincing evidence that nutrition has a significant role in the prevalence of somatic diseases. This suggests that a person's lifestyle choices and general well-being are considerably affected by eating habits. These factors can have a significant impact on a person's quality of life and can have long-term consequences if left unaddressed (Hammen, 2005; McManus et al., 2016; Shirom, 2005). By identifying these elements, this study aimed to gain a comprehensive picture of individuals' well-being and enable the targeted provision of support and resources for promoting and maintaining optimal health and well-being. Therefore, the current research examined physical activity, nutrition, alcohol, and stress. It is essential to acknowledge that the other mentioned domains and variables on this topic will be covered in another thesis conducted by the 2nd researcher, ensuring a comprehensive examination of the subject matter.

In recent years, institutions have prioritised employee well-being, with an increasing number of companies implementing such programs and initiatives (Lovejoy et al., 2021; Schulte & Vainio, 2010). This action is necessary as there continues to be an increase in adverse health effects, as reported by the International Labour Office (WHO, 2021). New studies shed light on the urgent need for improvement in the Occupational Safety and Health (OSH) management system (WHO, 2010). It is essential to find new methods to increase well-being at work as workplaces have undergone significant changes in recent years. Fontana et al. (2023) argue that the contemporary workplace is constantly evolving, with issues related to age, gender, migration, climate change, unpaid employment, and the pandemic. These factors profoundly negatively impact overall work quality and employee well-being, such as workers' health but also their families' well-being and social environment. Moreover, recent studies provided substantial evidence that the factors mentioned above contributed to the onset or progression of various illnesses, pathologies, and syndromes (Caruso, 2014; Schulte et al., 2015; Leso et al., 2021). Fontana et al. (2023) suggested that, in this context, occupational health guidelines should focus on these work-related factors and go beyond the assessment of conventional risk factors alone. The mentioned factors highlight a significant need for change and new interventions. Online tools and interventions present a cost-effective and tailored approach to reach potential

employees and minimise the mentioned risk factors to ensure employee well-being (Carter, 2020; Lovejoy, 2021).

The acceptability of physical and health promoting tools presented by HR to staff members is a crucial factor in determining their effectiveness in promoting employee well-being. The participants' attitude toward this web-based health assessment tool is crucial to consider while using digital questionnaires. The Unified Theory of Acceptance and Use of Technology (UTAUT), a scientific theory, has been established to do this. UTAUT finds four crucial constructs that could have a significant impact on how participants accept our new developed lifestyle-check questionnaire. The acceptance of the questionnaire was assessed by measuring participants' intention to participate in the lifestyle check in the future. This intention to participate served as the predictor of acceptability in the UTAUT analysis. Participants were asked about their willingness to participate in the lifestyle check, and their responses were used as the dependent variable in this analysis. By examining the relationship between participants' intention to participate we aimed to gain insights into the acceptability and potential effectiveness of the tool. The Unified Theory of Acceptance and Use of Technology (UTAUT) identifies four categories influencing acceptance. These categories serve as a framework for understanding the determinants that impact how the lifestyle check questionnaire is accepted and utilized.

“Performance expectancy” refers to users' perceptions of the technology's utility and how it will enhance their performance in accomplishing tasks or attaining goals, which is the first major construct. It is essential that participants believe the survey will help them reach their physical & mental health objectives in order to accept it (Marikyan & Papagiannidis, 2021). The second key construct is “effort expectancy”, which refers to the perceived ease of use of the questionnaire and the effort that is required to use it effectively. A digital questionnaire should be easy to use, and the length of the questionnaire is advisable to be moderate for participants (Marikyan & Papagiannidis, 2021). “Social influence” is another key factor that plays a role in the acceptance of digital questionnaires. It describes how the participants perceive the opinions of important others, such as colleagues or mental health professionals. The last factor, “facilitating conditions”, is the extent to which the institution has the technical capabilities to support the use of the system (Marikyan & Papagiannidis, 2021). To ensure the acceptability and effectiveness of digital questionnaires, it is crucial to consider these key constructs of the Unified

Theory of Acceptance and use of Technology (UTAUT). The perceived usefulness of the questionnaire and its ease of use should be prioritised, as well as the support from important others and the availability of necessary resources. By focusing on these factors, digital questionnaires can be effectively implemented in various settings and improve the mental health outcomes of participants.

Several factors play a significant role in the effectiveness of eHealth tools, including their perceived relevance to employees' mental health needs, usability, and the perceived privacy and confidentiality of the information shared. Privacy and confidentiality are vital considerations in the domain of eHealth tools as they ensure the safety and trust of participants. Handling highly personal data necessitates measures to prevent unauthorized access by individuals not involved in the process. Wilschofka and Ziefle (2011) emphasised that security and privacy concerns hold substantial importance among potential users of eHealth technologies, and it is essential to consider variations in attitudes to maximize usability and acceptance. Participants are more inclined to use E-health tools that were viewed as helpful and applicable to their mental health needs, provided actionable feedback, and offered tailored recommendations (Schueller, 2018). Overall, these findings imply that the efficacy of new mental health tools given by HR in increasing employee well-being depends on their acceptance and that this factor should be taken into account in the design and deployment of such tools.

The study used the CeHRes roadmap as a blueprint for the development, implementation and evaluation of eHealth tools. In this case, the eHealth tool of an online questionnaire. The CeHRes roadmap is a comprehensive guide for the development and evaluation of eHealth technologies. It includes evidence-based practices from different fields and consists of interconnected phases and evaluation cycles to ensure stakeholder perspective and contextual relevance and to support the planning, coordination and implementation of eHealth development processes (Gemert-Pijnen et al., 2011 & University of Twente, 2019). The CeHRes roadmap typically consists of five distinct phases, also implemented in this study. In the initial phase, the focus was on understanding user needs and the current healthcare landscape, encompassing an analysis of both strengths and weaknesses in care provision (Prefix). Following this, the value specification phase aimed to identify the values of relevant stakeholders and refine user requirements. These values and requirements were then translated into specific criteria that served as the foundation for technology development. During the design phase, the team adopted

a cooperative approach, closely collaborating with users and stakeholders to create a prototype or version of the technology that aligned with the identified requirements. Upon completing the technology development, the operationalization phase involved taking the necessary steps to introduce the technology. This encompassed the creation of plans to reach as much staff members as possible and the establishment of organizational workflows to ensure a smooth practical implementation. Lastly, the summative evaluation phase involved assessing the eHealth technology by examining its utilization and impact on patients and the healthcare system, particularly regarding the participant's feedback.

Taking into consideration the aforementioned factors this study aims to improve the current questionnaire and develop a more valid and reliable instrument to assess risk factors and employee well-being. Pre-testing the questionnaire will be the first step in order to better understand the existing state of well-being among the University of Twente personnel. By doing so, we aimed to gain valuable insights into the well-being status of UT employees and determine if there is a greater need for well-being interventions within this specific context. The findings of this study will contribute to drawing conclusions about the adequacy of the current lifestyle check utilized at UT, particularly if the overall score indicates a low level of well-being. This investigation seeks to inform the development of more effective interventions and provide recommendations for enhancing the well-being assessment process at UT. Additionally, we aim to develop a questionnaire and evaluate its acceptability among staff members.

The evaluative component of the study will be analysed to assess the overall reception of the questionnaire among the study participants. Furthermore, we aim to identify the underlying factors contributing to the divergent assessments received. We will conduct an analysis to determine whether there are any notable differences in satisfaction levels between participants based on their employment status and age. Specifically, we aim to investigate whether significant differences exist in satisfaction levels between participants with permanent and temporary contracts. Variations in contract types can exert an influence on employee engagement and motivation within an organization, and this influence may extend to their willingness to use eHealth tools (Chadi & Hetschko, 2016). Customizing the questionnaire allows for the identification of factors that either foster or impede engagement, thereby enabling the implementation of more effective and targeted interventions specifically tailored to the staff population. The analysis we will conduct in this study is crucial in order to customize the

questionnaire to align with the specific employment contracts at UT. This customization is essential to ensure the instrument's accuracy and suitability for all staff members. To enhance the effectiveness of the questionnaire in identifying and addressing mental health concerns within the University of Twente, the questionnaire will be tailored based on the different contract types. This approach aims to optimize its applicability and relevance for employees with different contractual arrangements. Furthermore, this investigation will assess the suitability of employing a universal uniform tool versus developing contract-specific questionnaires, contributing to a more targeted and comprehensive approach.

To achieve the research aim, we have formulated the following research questions that will guide the development, pre-testing, and evaluation of the questionnaire:

RQ1: *What are valid measures to include in the UT lifestyle check intake questionnaire for mental health & physical health-related Lifestyle behaviours¹?*

RQ2: *How do University of Twente staff score on the novel health indicators for mental health & physical health-related lifestyle behaviours compared to a sample staff population?*

RQ3: *How do UT staff perceive and accept the novel Lifestyle check questionnaire? What factors influence their willingness to participate in the lifestyle check, and are there any significant differences in acceptance based on various types of employment contracts?*

Methods

Design

This study adopted a mixed-methods design, encompassing both quantitative and qualitative approaches. The Lifestyle Check (LSC) was used to address Research Question 2 and conduct a UTAUT-based survey on acceptance to predict intention to use the eHealth tool in the future. The qualitative aspect includes a co-creation process with UT-HR and gathering open-ended data on acceptance from the survey (The qualitative analysis can be found in the report of the second researcher). Stakeholder involvement and feedback were sought to refine the questionnaire and ensure its relevance for all staff at UT.

¹ The results pertaining to RQ1 will be presented in the materials section.

Participants

The study recruited participants from the University of Twente staff, with a mean age of ($M_{age} = 43.5$, $SD_{age} = 11.92$). The sample consisted of 101 participants (65 females (63.11%), 36 male participants (34.95%) and two others who prefer not to say (1.94%), with information about other relevant demographics being provided. The inclusion criteria for this study comprised all staff members irrespective of their contract type or long-term employment, with no exclusion criteria being established. To ensure a uniform sample size for analysis, only complete cases were included in the study. Out of a total of 123 participants who answered the questionnaire, 20 participants did not complete it in its entirety or left out essential questions required for comparison and analysis and were, therefore, excluded. Therefore, the final analysis was based on data from 103 participants who provided complete responses.

The study employed convenience sampling. A collaborative effort was undertaken involving the HR department, the physiotherapist, and our supervisor. The HR department facilitated the distribution of our questionnaire through the UT employee newsletter, accompanied by an introductory text that is provided in the appendix. Additionally, our supervisor shared the questionnaire with colleagues from the BMS faculty. However, despite these initial efforts, the number of participants still needed to be increased. To address this, the physiotherapist reached out to individuals who had previously completed a lifestyle check in order to contribute to its improvement. Furthermore, to encourage participation, a reminder regarding the questionnaire was included in subsequent editions of the newsletter. All participants were required to provide informed consent before participation and had the option to withdraw from the study at any time. The exclusion of participants or changes in sample size may occur due to such withdrawals. The study received approval from the ethics committee of the University of Twente (Number 230259).

Materials

The study's methodology involved administering a questionnaire divided into several parts, starting with the informed consent section, then the collection of demographic data and general questions, and subsequently measuring the appropriate constructs to gain insights into the participants' lifestyle. The questionnaire concluded with a series of evaluative questions designed to measure acceptance. The questionnaire was created from a mixture of existing

validated measurements and measurements developed by the UT lifestyle coaches. Those were combined into a uniform questionnaire with Qualtrics.

The informed consent process consisted of an introductory section that provided a clear understanding of the purpose of the questionnaire, along with the subsequent questions. The section outlined the correct procedure for the lifestyle check and precisely described the intended use and handling of data, including the option for participants to receive their results. It was also made clear that participation was voluntary and that participants had the freedom to discontinue their involvement at any time. The contact details of the researcher and physiotherapist were provided, and participants were required to agree to the terms outlined and indicate their consent by checking a box to proceed.

The initial section of our questionnaire focused on the participants' demographic data. The first part consisted of gathering basic demographic information, which was crucial for differentiating among participants and identifying potential reasons for varying acceptance levels of the questionnaire. The first part of the demographics inquired about age, gender (female, male, or other), nationality (Dutch or other), and contract status (temporary or permanent). The second part inquired about medical conditions, medication use, and drug use, as these factors could significantly influence well-being.

Eligible questionnaires for UT lifestyle-check

For measuring stress, the perceived stress scale (PSS) was used. It was originally developed by Cohen & Williamson (1988) and is one of the most extensively used measures in the world for measuring chronic stress (Huang et al., 2020). It is a 10-item questionnaire with a 5-point rating scale. The ten items consisted of 10 questions based on how often participants felt a specific way in the last month. Items 4, 5, 7, and 8 measured positive feelings such as confidence, feeling in control, and managing irritations in one's life. Items 1, 2, 3, 6, 9, and 10 measured negative feelings such as being upset, nervous and stressed or unable to control important things. The rating scale ranged from "never" (0) to "often" (4), resulting in a total score between 0 (low stress) and 40 (high stress). Positive item responses (4, 5, 7, and 8) were reverse-coded. The scores were categorised as "low stress" (0-13), "moderate stress" (14-26), and "high perceived stress" (27-40). The Perceived Stress Scale (PSS) was initially developed and validated on a sample of the American population; however, subsequent studies have

demonstrated its applicability in other countries. This may be due to the PSS's construct being relatively independent of gender and race, allowing for cross-cultural use (Makhubela, 2020 & Cohen, Kamarck, & Mermelstein, 1983). The Perceived Stress Scale (Cohen & Williamson, 1998) has been established as a reliable and valid measurement of perceived stress. It has shown good test-retest reliability and convergent and discriminant validity (Cohen et al., 1983). The scale exhibits strong internal consistency with a Cronbach's Alpha of 0.89 (Roberti et al., 2006). The Dutch-validated version of PSS-NL also demonstrates strong internal consistency (Jans-Beken, 2019). This standardised instrument provides a quick and reliable evaluation of perceived stress, enabling lifestyle coaches to obtain an overview of participants' current stress levels. The PSS has been validated for various populations, including staff, making it a relevant and applicable measurement tool. Its use ensures consistent and comparable data, simplifying the analysis and interpretation of results. Additionally, the widespread adoption of the PSS in stress research facilitates identifying comparable groups in the literature, saving time and effort.

To assess depression and anxiety, the Hospital Anxiety and Depression Scale (HADS), a 14-item questionnaire divided into seven depression items and seven anxiety items, was used (Spinhoven et al., 1997). The questionnaire used a four-point Likert scale with a total score calculation. The given score ranges of 0-7, 8-10, and 11-21 allowed for a simple and direct assessment without requiring additional calculations. Although the HADS was initially designed for somatic outpatients, it is reliable for the general population aged 18-65².

For investigating alcohol usage, the "AUDIT" (Alcohol Use Disorder Identification Test: Self-report Version) was chosen. The AUDIT is a screening tool measuring alcohol-related problems and drinking behaviours developed by the World Health Organization (WHO). The items are ten questions regarding the participants drinking behaviour, e.g. "How often do you have a drink containing alcohol?". The responses are gathered via a 5-point Likert scale, with values/scores between zero & four. Mostly 0 is defined as "never", 1 is defined as "monthly or less", 2 is defined as "2-4 times a month", 3 is defined as "2-3 times a week", 4 is defined as "4 or more times a week". According to a study by Noorbakhsh et al. (2018), the internal consistency of the original AUDIT form is excellent, with a Cronbach's Alpha of 0.96.

² The current study did not include the Hospital Anxiety and Depression Scale (HADS) in the survey. This decision was made based on careful consideration and is outlined in the Procedure section.

Furthermore, the test-retest reliability on a specific group was stable over time with a Cohens Kappa value of 0.64 (Noorbakhsh et al., 2018). While the AUDIT was initially designed for international use, it has also been translated for the Dutch population and is available on the original AUDIT website (<https://auditscreen.org/translations/>). A recent study by Van Gils et al. (2021) validated the AUDIT for a population of older Belgian adults, reporting a Cronbach's Alpha of 0.72, indicating reliable internal consistency. The AUC for the AUDIT is 0.905 (95% confidence interval = 0.890-0.921, $p < 0.001$). Consequently, the AUDIT is a very accurate test for detecting risky or hazardous alcohol consumption and potential alcohol dependence. The AUC (area under the curve) is a statistical measure of the ability of a test to distinguish between two groups (in this case, between those who have hazardous or harmful alcohol consumption (scores between 8-14) and those who do not (below 8)). An AUC of 0.9 or more indicates high accuracy. The confidence interval (C.I.) of 0.890-0.921 indicates that this level of accuracy is likely to be consistent across multiple samples, and the p -value of less than 0.001 indicates that it is statistically significant.

The AUDIT is a highly valid and reliable questionnaire for assessing alcohol use and related problems. It comprehensively measures consumption patterns and potential risks by considering dimensions such as frequency, quantity, and associated problems. Its standardized nature allows for drawing meaningful conclusions. Widely used worldwide, the AUDIT provides access to a wealth of literature and comparative studies, making it the questionnaire of choice for this population.

To assess physical activity (PA), the IPAQ (International Physical Activity Questionnaire) was used. It is an international self-administration form for obtaining international comparable data on physical activity in the general population (Hagströmer & Sjöström, 2006). Due to the large extent of the original IPAQ, the short form (IPAQ-SF) is used in this study, consisting of only ten items without a special grouping but with the same scoring categories. The IPAQ-SF has been developed for the age group of 18-85 years, with a moderate internal consistency of 0.647 (Ács et al., 2021). For the general adult population, the computerised Dutch IPAQ is a reliable and moderately valid instrument for measuring physical activity (Vandelanotte, 2009). Validity was assessed through a rigorous examination of the results obtained from various measures, such as the CSA. The correlations between these measures were found to be moderate to high, providing compelling evidence for the validity of

this version of the IPAQ. The strong associations observed between the IPAQ and previously validated measures support its validity in accurately capturing the intended construct of physical activity. On the other hand, reliability was evaluated using the intra-class correlation (ICC). The ICC scores, ranging from 0.6 to 0.83, indicate good to excellent reliability. These findings suggest a high level of consistency and agreement between measurements obtained from different raters or methods, reinforcing the reliability of the IPAQ as a consistent and reproducible tool for assessing physical activity levels (Vandelanotte, 2009).

The IPAQ-SF demonstrates moderate psychometric properties. Although the IPAQ-LF (Long Form) is more valid and reliable, it was not included due to its length. The IPAQ-SF is a standardised measurement that allows for comparable results, assessing physical activity duration, intensity, and frequency. It provides a comprehensive overview for analysing and guiding lifestyle coaches. The IPAQ is internationally used and available in multiple languages, including Dutch, simplifying its implementation in this study.

The university's HR department was consulted to assess participants' nutritional status due to the unavailability of a suitable nutritional questionnaire. In line with this, the "good nutrition guidelines" were utilised, which were developed by a qualified Dutch dietician based on the recommendations of the statutory Health Council of the Netherlands (<https://www.samengezond.nl/richtlijnen-goede-voeding/>). Although the information on the validity and reliability of this questionnaire is unavailable, it is assumed to provide a solid foundation for initiating a conversation with the lifestyle coach on general nutritional habits. The questionnaire comprises 18 questions that address the frequency, amount, and type of food consumed and incorporates both open-ended and pre-categorised response options. It is important to note that the nutrition questionnaire was excluded from our data analysis as it is not relevant to our current research objectives. The questionnaire solely serves as a tool for the lifestyle coaches during their conversations with participants. While the data may have potential utility for research purposes, they are not pertinent to our study objectives.

Regarding the UTAUT theory, we identified various constructs to examine participants' acceptance and use of the lifestyle questionnaire, including the construct of "Response Efficacy", which was assessed through two key questions, investigating how the questionnaire facilitated access to participants' current lifestyle and motivated them to make lifestyle improvements.

The "Effort Expectancy" construct explored participants' perceptions of the questionnaire's understandability, ease of completion, and potential annoyances. To ensure clarity, the item related to annoyance was reverse-coded since it was framed negatively, while the others were positive. Additionally, the study explored "Facilitating Conditions" by inquiring about participants' knowledge and confidence in completing the lifestyle questionnaire. The researchers also assessed whether participants knew whom to contact if they faced any difficulties. Furthermore, three additional questions were included to capture other essential aspects of interest. Participants were asked about the comprehensiveness of the lifestyle questionnaire in covering relevant topics, their evaluation of the questionnaire's length, and whether they perceived any privacy-related concerns.

In order to enhance validity and ensure accessibility for all staff members, the questionnaires were administered in English and Dutch. This approach included using the Dutch variation/translation for each questionnaire. By offering the questionnaires in both languages, the study aimed to accommodate staff members who may not be proficient in English, thus enabling their participation and ensuring inclusivity.

Procedure

The procedure in this study involved multiple stakeholders, and as such, several meetings were organised from the outset to agree upon the progress and steps to be taken. Following the compilation of questionnaires as described in the materials section, the questionnaires were reviewed with HR, resulting in the decision to omit depression and anxiety due to the lack of sufficient facilities for providing adequate follow-up in these areas. The omission of the HADS was deliberate to focus on other relevant constructs and minimise respondent burden. The selected measurement tools were tailored to the study's objectives, aiming for survey efficiency and participant engagement. To gauge participant interest in questionnaires on these topics, evaluative questions were considered. However, these constructs were ultimately excluded due to HR's decision not to approve their inclusion. After all final questions and issues were discussed, various stakeholders provided feedback on improvements, which were subsequently edited and resubmitted until UT staff tested the Dutch and English versions once, providing further feedback. The remaining ambiguities and technical errors in the questionnaire were then dealt with. Concurrently, the informed consent and the last page were edited to clarify all

potential risks and issues. The direct option to contact the researchers and lifestyle coaches was provided through a hyperlink to facilitate communication. Upon completion, an introductory text was composed to provide information in the email accompanying the questionnaire. This included general information from the informed consent and attempted to motivate participants to partake in the study to gain insights and promote improvement. The questionnaire will be sent to the university staff via the news feed. The emails contain a general explanation and information about the purpose of the study. A link is provided so staff members can be easily directed to the questionnaire. If there were not enough respondents, individual emails would have been sent to each university department to increase the chances of getting enough participants.

Data Analysis

In analysing the reliability of the lifestyle check, we employed Cronbach's Alpha for each construct within the questionnaire. The analysis solely focuses on the constructs within the lifestyle check questionnaire that are directly related to our research aims. For constructs such as stress and alcohol, which shared the same response format across all items, we reported the raw alpha as the most reliable estimate. On the other hand, we utilised the standardised alpha for physical activity where the response format differed.

Statistical comparisons were conducted using t-tests to assess differences between the population in this study and the comparative populations. Furthermore, a binomial test was conducted to compare the difference between low-stress groups on the perceived stress scale. The resulting statistical outcomes are presented in a table (Appendix D). The choice of statistical test depended on the nature of the data being analysed. For mean scores, one-sample t-tests were employed. In the case of perceived stress, a binominal t-test was appropriate since a specific category was compared (low-stress groups). Descriptive statistics were used to summarise the scores of each questionnaire, where categorical variables were reported as frequencies and percentages, and continuous variables were summarised using means and standard deviations. To compare differences between groups, t-tests were applied for comparing means, while binominal tests were performed for categorical data, with no violation of assumptions.

The assessment of stress levels was conducted using the pre-defined scoring system of the Perceived Stress Scale (PSS), which categorises individuals into distinct groups based on

their perceived stress levels. The categorisation includes low, medium, and high-stress levels, as outlined by Ewa Wilczek-Rużyczka in her work published in 2022. By utilising this established categorisation approach, we aimed to classify participants according to their perceived stress levels objectively and enable meaningful comparisons across groups in our research analysis.

Alcohol use was assessed using a comparative null value of 10.96 (Foster, 2017). The present study aimed to compare physical activity levels with a study conducted by Khodaveisi et al. (2021); the physical activity levels of their sample were assessed. The study reported a group mean of 3,648 minutes of physical activity per week (SD = 4,760.72) for physical activity. The obtained p-value was 0.172, indicating the statistical significance of the observed differences in physical activity levels.

Turning to the evaluation of closed-ended questions, we conducted a bivariate analysis followed by a regression analysis to investigate the influence of UTAUT items on participants' intention to participate in the lifestyle check. This analysis involved correlating the UTAUT-related items with participants' responses to the question: "Would you be interested in completing a lifestyle check in the future?". In this study, we specifically focused on several key items that drew our attention, as outlined in the introduction. These items pertained to the following inquiries: "To what extent does the Lifestyle Check questionnaire comprehensively address essential dimensions of lifestyle assessment?", "How do respondents evaluate the questionnaire's length?" and "Do participants perceive any potential privacy intrusion in the Lifestyle Questionnaire?" Response efficacy was measured with two items: "Will help to access my current lifestyle" and "Motivates me to improve my lifestyle." A correlation matrix was employed to examine their correlation coefficient due to the limited number of items ($n = 2$) for response efficacy. The correlation coefficient of $r = 0.25$ indicated a non-significant correlation between these items. For effort expectancy, the questionnaire included the following items: "The questionnaire is understandable," "...easy to fill in," and "...annoying to fill in." The item "annoying to fill in" was reverse-coded to account for its negative expression, while the other statements were positive. Therefore, appropriate scoring adjustments were made. Regarding facilitating conditions, the questionnaire included the items "I have the know-how necessary to complete the lifestyle questionnaire" and "I know who to contact if I have questions or

difficulties filling in the questionnaire." As there were only two items, their correlation coefficient was examined to determine their relationship and measure the same construct. Additionally, three additional questions were identified as potentially influencing participants' intention to participate in the lifestyle check: "Did the lifestyle check questionnaire cover all the topics that you think are important for measuring lifestyle?", "The length of the questionnaire was...?" and "The lifestyle questionnaire contains questions that are too privacy-sensitive." These items were evaluated to determine if they formed a cohesive construct using Cronbach's alpha.

By examining participants' responses to these specific inquiries, we aim to gather meaningful information that can contribute to improving the effectiveness and relevance of the Lifestyle Check. The findings will guide us in making necessary adjustments, ensuring comprehensive coverage of relevant topics, achieving an appropriate questionnaire length, and addressing privacy concerns conscientiously. Furthermore, missing values were recorded to identify any questions participants found too personal or privacy-sensitive.

To capture participants' personal feedback on the lifestyle questionnaire, we qualitatively analysed the open-ended questions. This qualitative analysis³ involved using Atlas.ti software to apply an inductive coding approach, allowing us to categorise and analyse the responses.

Results

UT Staff Scores on Novel Health Indicators & comparison sample

The demographic characteristics of these respondents can be found in Table 1. It is worth noting that none of the variables included in the study had missing values exceeding a percentage of 10 or higher.

Table 1

Sociodemographic Characteristics of Participants

Characteristic	n	%
Gender		
Female	78	65

³ The qualitative analysis and corresponding results can be found in the thesis of the second researcher.

Male	40	33.3
Other	2	1.6
Nationality		
Dutch	101	84.9
Other	18	15.1
Contract		
Permanent	96	77.4
Temporary	24	19.4
Occupation		
Academic	36	64.5
Support	80	29

The UT sample consisted of staff that completed the Perceived Stress Scale (PSS) questionnaire. The distribution of stress levels indicated that the majority of the participants reported low stress 56% , while 40% reported medium stress, and 4% reported high stress. The mean stress score was rounded to 13.5, indicating that the sample's mean is slightly above the cut-off score of low perceived stress. It overreaches the low-stress threshold with a value of 0.5. Including (SD = 6.63). The interquartile range (IQR) was 10, suggesting high variability in stress levels among the participants, meaning a high diversity in the participants' scores.

In the comparison group for perceived stress, a study population comprising research and teaching staff from a Krakow-based university was selected. The research was conducted in 2020. The mean age of the participants was 45 years ($M = 45$, $SD = 8.92$), with ages ranging from 29 to 67. Among the 67 participants, 34 were women, and 43 were men. It is important to note that the researchers did not differentiate between genders beyond the female and male categories in this particular population (see Table 2 in Appendix). The distribution of stress levels indicated that the majority scored high on the perceived stress scale, with nearly 42 per cent of the people indicating low-stress levels. 28.36% indicated medium stress levels, and nearly 30% indicated high-stress levels.

A comparison was conducted using an exact binomial test to examine the low-stress levels between our study group and a comparison group. Out of 100 trials, 56 cases indicated low-stress levels ($p = 0.004$), supporting the alternative hypothesis of a difference in the

probability of low-stress success. The binomial test results revealed a significant disparity in low-stress levels between the UT sample and the comparison group, suggesting a higher prevalence of low-stress individuals within the UT population.

Table 3:

Distribution and Summary Statistics of Perceived Stress Levels UT & comparison group

Stress level	UT sample		Comparison group	
	<i>n</i>	%	<i>n</i>	%
Low	56	56	28	41.79%
Medium	40	40	19	28.36%
High	4	4	20	29.85%

*Note: Percentages represent the proportion of participants in each stress level category.

The sample of UT staff completed the AUDIT questionnaire with a median alcohol score of 3, with a mean score of 3.7. The first quartile value was 1, indicating that 25% of participants had alcohol scores below this value, while the third quartile value was 5.00, indicating that 75% of participants had alcohol scores below this value. The highest recorded alcohol score was 15, indicating a likelihood of alcohol dependence. The skewness value was 0.43, suggesting a slightly rightward skew in the distribution. The interquartile range (IQR) was 4, indicating that the spread of the data is moderately distributed and that there is dispersion between the values within the middle half of the dataset in alcohol scores among the participants. 12% of the participants scored above low-risk, and 88% scored below harmful alcohol consumption (Appendix B).

The comparison group consisted of a sample from a university in South England, which was recruited via an address book. The sample included 488 respondents. The mean score of the sample was $M = 8.7$ ($SD = 4.11$). (Appendix B)

The results indicated a highly significant difference in the mean score ($t = -15.819$, $df = 99$, $p < .001$), providing strong evidence against the null hypothesis. The observed mean score ($M = 3.7$) significantly differed from the hypothesized mean of 8.7, suggesting a lower risk of harmful alcohol consumption in the UT population.

Table 4*Overview of Alcohol Use Utwente sample*

Category	N	Mean	SD	%
Total	100	3.7	3.16	
Abstainer	12			12
Low-risk consumption	76			76
Hazardous drinking	11			11
Alcohol dependency	1			1

Physical activity of the University of Twente sample was assessed, and the results showed that 10 participants (10.31%) reported low activity levels, 51 participants (52.58%) reported moderate activity levels, and 36 participants (37.11%) reported high physical activity. This sample had an average combined physical activity level of 2777.66 minutes per week (SD = 2307.95). On average, participants in the sample engaged in 1211.10 minutes of vigorous physical activity per week (SD=1581.1). The sample mean of time spent on moderate physical activity was 806.72 minutes per week, with an SD = 715.3. The average time spent walking in one week was 759.89 minutes (SD = 720.9).

The comparison group for physical activity included 130 teaching staff members from the Hamadan University of Medical Sciences. The inclusion criteria for this group ensured that the participants are working in this domain for at least one year, aged between 25-50 years and do not use drugs that affect physical activity. The group consisted of 65 participants in total, 27 female and 38 male. Again in this study, it was just differentiated between females and males. The population had a mean age of 40.72 years (SD = 9.36) (Appendix C). The comparison group exhibited an average weekly combined duration of 3648.30 minutes engaging in various forms of physical activity, with a standard deviation of 4960.72.

A one-sample t-test was conducted to compare the mean minutes of combined physical activity (minCOM) between the study and comparison groups. The results indicated a significant difference in minCOM between the two groups ($t(96) = -3.7153$, $p = 0.0003409$). The sample mean for the UT study group was 2777.658 minutes, with a 95% confidence interval ranging from 2312.503 to 3242.813. These findings provide evidence of a substantial difference in

combined minutes of physical activity between the study group and the comparison group. Compared to the comparison sample, the UT population has a lower physical activity level.

Table 7

Physical activity UT

Physical activity category	Mean duration (minutes/week)	SD (minutes/week)	N	%
Total physical activity	2777.66	2307.95	97	
Vigorous activity	1211.10	1581.1		
Moderate activity	806.72	715.3		
Walking	759.89	720.9		
High	4774.66	2673.37	36	37.11
Moderate	1814.76	595.65	51	52.58
Low	499.25	280.52	10	10.31

Factors Influencing Willingness to Participate in the Lifestyle Check

Both items showed low correlations with the dependent variable (maximum $r = 0.13$) for response efficacy. The correlations between "Will help to access my current lifestyle" and the intention to participate ($p = 0.51$) and between "Motivates me to improve my lifestyle" and the dependent variable ($p = 0.22$) were not statistically significant in our sample. Consequently, these response efficacy items cannot be used as individual predictors in the multiple regression analysis and have been excluded from further analysis.

Cronbach's alpha of the effort expectancy was computed for the three variables (data analysis), yielding a value of $\alpha = 0.57$, which fell below the recommended threshold of 0.6. However, upon removing the "annoying to fill in" item, the raw alpha increased to $\alpha = 0.8$. Thus, this item was excluded and treated as a separate predictor if the p-value was less than .10 in relation to the dependent variable. However, the obtained p-value exceeded the cut-off point ($p = .2$), indicating that this item would not be included in further analysis. The remaining two items were included in the regression analysis as they measured the same construct.

Regarding facilitating conditions, the correlation coefficient was slightly positive but not

statistically significant, indicating that these items did not belong to the same construct. Moreover, both items exhibited a correlation coefficient of $r = 0.19$ with the dependent variable, further suggesting a lack of correlation between the independent and dependent variables. Therefore, the decision to include these items as individual predictors in the UTAUT analysis depended on the significance level of the p-values. The item "I have the know-how necessary to complete the lifestyle questionnaire" yielded a p-value of 0.06, indicating a marginally significant relationship with the dependent variable. Hence, this item was considered suitable for inclusion as a single predictor in the regression analysis. Similarly, the item "I know who to contact if I have questions or difficulties filling in the questionnaire" obtained a p-value of 0.05, indicating a borderline significant relationship. Therefore, this item was also included as a single predictor in the regression analysis.

Additionally, three additional questions were identified (data analysis). The calculated raw alpha coefficient of $\alpha = 0.32$ fell below the recommended threshold of 0.6, and even after dropping an item, the benchmark was not reached. Hence, it was more appropriate to consider these items as individual predictors rather than part of a unified construct. The decision to include these items in the regression analysis depended on their respective p-values, with a significance level set at $p < 0.1$. The item assessing privacy sensitivity obtained a p-value of 0.40, which did not provide compelling evidence of a correlation with the dependent variable. Therefore, this item was excluded from the regression analysis. Regarding the item evaluating the length of the questionnaire, the calculated p-value of 0.06 indicated a marginal significance level. Thus, it was included as a single predictor in the regression analysis. However, the obtained p-value of 0.10 slightly exceeded the predetermined threshold for the item exploring the coverage of all topics. Consequently, only two out of the three questions will be included as single predictors in the regression analysis.

The overall model was not significant, $F(4, 88) = 2.017$, $p = 0.09$, suggesting that the predictor variables did not collectively explain a significant proportion of the variance in the dependent variable. The adjusted R-squared ($R^2 = 0.04$) indicated that the model accounted for a minimal amount of the variance. Among the individual predictor variables, none of them reached statistical significance.

Table 15

Results of the multiple regression analysis of UTAUT items on intention to participate

Factor	B	P	T
Intercept	1.4	0.04	2.07
Effort expectancy	-0.04	0.7	-0.39
Know-how	0.11	0.18	1.36
Know who to contact	0.06	0.23	1.22
Length of the questionnaire	0.26	0.14	

* The table presents data from N=93 participants who answered the questions based on the specified constructs.

Differences in Acceptance Based on Employment Contracts

A linear regression analysis was conducted to examine the influence of contract type on the willingness to participate in the lifestyle check. The model showed a non-significant effect of contract type on willingness to participate ($\beta = 0.16$, $p = 0.41$). The overall model was not statistically significant, $F(1, 92) = 0.68$, $p = 0.41$, $R^2 = 0.01$. These results suggest that contract type does not significantly explain the willingness to participate in the lifestyle check ($\beta = 0.16$, $p = 0.41$).

Perceptions and Acceptance of the Novel Lifestyle Check Questionnaire

Upon examining the evaluative questions, it becomes evident that most participants hold a positive impression of the questionnaire. However, this positive trend may not be immediately apparent from the current table presentation (Table 14). Among the 94 participants, a significant proportion, precisely 54 individuals, expressed a positive intention to participate in the study. Additionally, we observed an intriguing trend, as 26 more participants demonstrated interest, indicating a favourable inclination towards engaging in the study. It appears that most respondents agree that the questionnaire is understandable, that it is easy to fill in, and that hardly anyone finds it annoying to fill in the questionnaire. In the following tables, the scores for the different statements are shown. A notable finding was that the participants would like to see their scores, and only 5 disagreed with this statement, which shows a clear tendency. The participants expressed little distrust of privacy (Table 11). Opinions on certain opt-out options are not

uniform, but the majority tended to think that there should be more opt-out or better opt-out options. Another noticeable point is that most participants feel that the lifestyle check helps them assess their lifestyle, but almost half of the participants do not believe that the lifestyle check can help improve their lifestyles.

The facilitating conditions items are presented as separate items in Table 11. The majority of participants believe they have the necessary knowledge to complete the lifestyle check. In fact, most of them also know whom to contact in case of difficulties, but it can be seen that several of them were more uncertain, as significantly more said no. So more respondents are sure they know what they need to know rather than being sure who to contact if they have a problem. Most of the participants were satisfied with the length of the questionnaire and stated that the length was appropriate. However, there were also a small number of people who considered the questionnaire as too long. The overview can be found in Table 12.

The subsequent aspect of inquiry examined participants' perceptions regarding whether the questionnaire adequately addressed all the critical topics relevant to their lifestyles. Although the majority of participants agreed that the questionnaire covered all crucial topics, it is worth noting that 23 participants expressed partial disagreement with this statement. A detailed analysis of the written comments concerning the potentially missing topics in the questionnaire was conducted to gain further insights into their perspectives (Peters, 2023). The analyses of these comments can be found in the results section (see Results, Peters, 2023). Apart from 13 participants, all have already heard about the lifestyle check or have already taken part, and a majority would like to participate in the real lifestyle check in the future. Only 14 showed no interest in the lifestyle check.

If the individual points are summarised, it can be concluded that the lifestyle check questionnaire was accepted, and a large majority would like to do the entire process.

Table 11

Statements about the lifestyle check

Item	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly Disagree
Effort expectancy:					
Allow to see results	55	28	5	5	0

Help assess my current lifestyle	15	55	17	7	0
Is understandable	54	31	7	1	1
Is easy to fill in	49	35	10	5	0
Will help improve my lifestyle	5	23	44	15	7
Negative items:					
<i>Is annoying to fill in</i>	1	9	19	30	35
<i>Is too privacy sensitive</i>	3	17	24	16	34
Facilitating conditions:					
I have the know-how to complete the questionnaire	59	28	3	2	2
I know who to contact	32	27	9	19	7
Added items:					
More explicit opt-out options	10	20	28	20	15

*Note: all items presented in italics are negative items, while the remaining items are positively framed.

Table 12

The length of the lifestyle check questionnaire was...

Much too short	Too short	Appropriate	Too long	Much too long
0	1	81	11	1

Table 13

Before doing this survey, were you already aware of the possibility to do a lifestyle check and receive lifestyle coaching as a UT employee?

No, I never heard of this	Yes, but I did not use it myself	Yes, I have already used it
13	32	49

Table 14

Would you be interested in completing a lifestyle-check in the future (the whole process, including the physical tests and conversation with the lifestyle coach, not just the questionnaire).

No	Somewhat interested	Yes
14	26	54

Discussion and Conclusion

Our study aimed to enhance the existing lifestyle check questionnaire of the University of Twente by incorporating crucial dimensions of lifestyle and overall well-being. Furthermore, the aim was to utilize validated measurements to ensure the development of a reliable assessment tool. One objective of this questionnaire is to identify potential risk factors to later work with lifestyle coaches or psychologists to find methods to counteract these risks. A mixed-methods co-creation approach (CeHRes) was adopted to achieve this objective, combining stakeholder preferences with empirical evidence. Relevant questionnaires were selected based on scientific literature and research studies for different topic areas. The importance of specific topic areas supported by the existing literature was considered, and existing topics from the previous questionnaire were incorporated as desired by the stakeholders involved. Subsequently, the questionnaire results for risk factors, validity, and reliability were assessed.

The University of Twente staff population demonstrated relatively low scores on the new health indicator questions. The majority of participants scored low on stress levels, indicated consumption of alcohol below hazardous levels, and exhibited a moderate level of physical activity. To evaluate heightened risks to well-being and examine the validity, we compared the means or categories of interest in our sample with published norm scores. The t-test results revealed significant differences between our sample and the reference group, indicating consistent discrepancies in values. Specifically, our sample displayed a significantly higher prevalence of low-stress levels compared to the reference group, suggesting divergent outcomes that may compromise validity. Nevertheless, it is worth noting that the Perceived Stress Scale (PSS) maintains favourable validity, as supported by the findings of Prasetya et al. (2020).

Regarding the AUDIT scores, our population exhibited a significantly lower mean

compared to the comparison group. Notably, the population's only scores were found to be worse in the domain of physical activity based on the physical activity questionnaire, with a significant difference of over 1000 minutes of physical activity per week when compared to the reference (Pilkonis, 2016). However, it is worth noting that the IPAQ-SF exhibited a moderate reliability. While this value is slightly lower than the reported value in the reference study conducted by Ács et al. (2021), it is important to consider the usual uncertainty associated with point estimates. Thus, the observed difference in reliability scores does not significantly deviate from the expected range and does not compromise the overall quality of the questionnaire. These discrepancies in reliability could be attributed to several factors, including differences in sample size, cultural context, and administration procedures.

Despite expectations based on previous research (Fowler, 2006) suggesting that stress levels among university staff are typically high, the findings show that the overall stress level in the sample falls within the moderate range, with only a minimal number of participants experiencing high levels of stress (4%). These results could suggest that the university's well-being plan is effective and adequately tailored to the needs of its employees. The University of Twente's emphasis on employee well-being may contribute to the observed lower stress levels, which is particularly noteworthy considering the financial and excessive workload factors highlighted by Fowler. These findings suggest that, even after the impact of the COVID-19 pandemic, the majority of participants in our sample reported stress levels ranging from low to moderate, indicating the positive influence of the university's well-being initiatives.

The validity check revealed some challenges in comparing our data with previous studies. The Perceived Stress Scale study was conducted in a Polish university, and the AUDIT comparison group consisting of UK university staff had different focuses, making direct comparisons challenging. Similarly, the IPAQ-SF tests on the control group were relevant for our study, but different study objectives hindered direct comparisons. It is crucial to emphasise the facilitation of comparability between studies rather than solely focusing on the issue of low validity. By addressing these challenges, future research can enhance the understanding and applicability of findings across different study contexts. Based on the validation of all the measurements in previous studies, it can be presumed that the low validity does not stem from the measurements themselves but rather from significant differences observed within the sample. When examining the comparison groups closely, it becomes evident that numerous disparities

exist. It was challenging to find truly suitable comparison groups that closely matched the population, and often these measurements were only tangentially used to test the correlation between the instrument and participants' mental health. However, using the aforementioned groups as comparators is still acceptable, but a more rigorous selection of suitable comparison populations should be made for future projects.

Regarding the acceptance of our questionnaire, participants have demonstrated a clear inclination to accept the new questionnaire, as evidenced by the results presented in Table 14. A majority of participants expressed their willingness to participate again, particularly with the inclusion of conversations with lifestyle coaches at UT. These promising results suggest that this research is generating considerable interest and potential engagement among the participants, underscoring the significance of our investigation. These findings align with the evaluative aspect of the study, where participants provided valuable feedback for improvement, thus aligning with the study's objectives. It is worth noting that participants expressed positivity towards the individual measurements. This positive acceptance among participants suggests that the questionnaire effectively resonated with their experiences and provided meaningful insights into their lifestyles.

The regression analysis did not reveal a significant relationship between the items of the UTAUT theory and the willingness to participate in the lifestyle check. Several reasons may contribute to this lack of explanatory power compared to studies validating the UTAUT theory (Teo & Noyes, 2014). Due to the importance of a reasonably concise questionnaire length (Gummer & Daikeler, 2018), some questions originally included in the evaluative section were removed, resulting in only six items being included in the regression analysis. This reduction in the UTAUT items may have diminished the correlation and predictability (Oye, Iahad & Rahim, 2014; Dwivedi et al., 2011). Additionally, other variables may influence actual participation in the lifestyle check, and willingness to participate may not necessarily equate to acceptance (Schenk et al., 2007).

During the initial testing phase, feedback was actively gathered from individuals to gain insight into their perspectives, particularly regarding the questionnaire's length. Taking this feedback into account, the importance of considering the questionnaire's length during its development was acknowledged. Although speculation suggests a potential connection between

participants' acceptance of the questionnaire and its duration, existing scientific literature lacks empirical evidence to support this speculation.

Limitations

The study encountered limitations in communication and coordination with stakeholders such as physiotherapists, lifestyle coaches, and the human resources team. Disagreements arose over including depression and anxiety in the questionnaire, impacting its structure and consuming time. Nevertheless, this process informed topic selection and highlighted potential limitations.

It is important to clarify that the questionnaire alone is not intended to improve lifestyle choices but rather to be used in conjunction with conversations with lifestyle coaches to assess and gain insights into lifestyle factors. This distinction may not have been fully understood by participants due to the lack of a briefing, potentially leading to a misunderstanding of the questionnaire's intended purpose.

One significant limitation was the time constraint in developing a valid questionnaire that would satisfy all participants before data analysis. Limited resources led to using open-source questionnaires as the first available option. This restricted the choice of measurements, sometimes resulting in instruments with only moderate validity. Balancing comprehensive coverage and a manageable completion time of 45 minutes posed challenges, as a longer questionnaire could affect participant willingness to engage. Broader access to a wider range of measurements would have allowed for more reliable questionnaires in the study. For instance, the decision to employ the IPAQ-SF, despite its criticism and moderate validity, stemmed from limited options for assessing physical activity within freely accessible measures. Moreover, the adoption of a shorter version of the questionnaire was necessary due to the excessive number of items. This decision brought attention to the moderate validity concerns associated with the Short Form of the International Physical Activity Questionnaire (IPAQ-SF), as it may not be applicable in all studies. Lee et al. (2011) have argued that the IPAQ-SF tends to overestimate physical activity levels and may miscategorise individuals. This critique implies that the University of Twente sample may have an even lower average value of physical activity than reported. Critics even assert that the IPAQ-SF is a poor indicator of physical activity (Lee et al., 2011). Another limitation of the IPAQ questionnaire is its focus on the past seven days, which may not fully

represent the physical activity levels over the entire month. To address this issue, a question was included inquiring whether the past seven days accurately represent the overall activity patterns of the past month. This information is crucial for lifestyle coaches, as it allows them to consider this aspect and, if necessary, clarify any potential misinterpretations to obtain a more accurate understanding of participants' physical activity levels.

Another limitation arose during the search for a nutrition questionnaire, as no single questionnaire was available that measured as many different parameters as desired by the lifestyle coaches. Therefore, the old questionnaire developed by the lifestyle coaches based on dietary guidelines from the Dutch Ministry of Health was utilised. However, due to the nature of this questionnaire, it was excluded from the quantitative analysis. Instead, it served as a basis for discussion, providing the coaches with an overview of participants' dietary habits. As a result, the validity and reliability of the questionnaire are called into question. Resolving this issue is necessary to ensure the completeness and validity of the questionnaire.

One limitation is the variation in participant numbers for each measurement. Demographic data was available for 120 participants, while 100 participants completed the AUDIT questions and perceived stress scale. For the physical activity questionnaire, there were 97 participants. Though these differences minimally impact statistical significance, they could influence participants' acceptance of questionnaires, as some areas were omitted more frequently. (Further trends can be explored in the qualitative analysis; Peters, 2023). Additionally, some participants might not find specific subject areas relevant, leading to skipped responses. This provides an opportunity to investigate less-answered measurements and consider questionnaire modifications or adding a text field for participants to elaborate on their choices.

Further limitations are evident in the sampling method. With voluntary participation resulting in a self-selected sample mainly from two departments, limiting generalizability (Lieu & Dewan, 2010). Response bias may be present as participants were aware of the study's objectives, potentially influencing their responses (Grimm, 2010; Anderson & Mayerl, 2019). Moreover, including participants who had previously completed the lifestyle check may have positively influenced their willingness to participate again, potentially overestimating the overall willingness observed in the study (Peters, 2023). Further investigation into differences between participants with and without prior participation would require distinct groups (Lieu & Dewan, 2010).

Additionally, the potential selection of inappropriate predictors in the multiple regression model may have influenced our findings. As the UTAUT theory did not explicitly provide the chosen predictors, items were developed that were believed to align with the theory (Madigan et al., 2016). When discussing the limitations of this study, it is essential to recognize the possibility that unsuitable predictors might have been selected, contributing to the limited explanatory power of the model. However, it is worth considering that including self-generated items, as observed in models based on the Theory of Planned Behaviour (TPB), is a common practice in such research (Wedlock & Trahan, 2017). Additionally, the assumption that willingness to participate indicates acceptance of the questionnaire may oversimplify the complex factors influencing participation. Various underlying mechanisms could influence willingness to participate, even if acceptance of the questionnaire is acknowledged. These limitations emphasise the need for future research to improve predictor selection, explore alternative dependent variables, and consider a broader range of factors that might affect willingness to participate and acceptance of the questionnaire.

In this study, challenges were encountered with the selection and comparison groups, as the approach differed from previous studies. The selected studies focused on assessing University staff using the same measurement, limiting the options for comparison. Groups attempting to measure additional influences were included, resulting in fragmented results within their respective interest categories. This situation made it challenging to present consistent results, as extensive data from the sample could only be compared using means. Consequently, the results section appeared uneven, with limited variety in presentations and tables. Despite these limitations, the study aimed to address the key research questions and draw meaningful insights from the available data. Therefore, finding more suitable comparison groups is crucial to enable a more detailed comparison of our results and obtain more coherent findings.

Although the study may have lacked some validity, satisfactory reliability was achieved, and participants expressed contentment. The majority of participants indicated satisfaction with the lifestyle questionnaire and willingness to participate again, despite it being the initial attempt at developing such a tool. This demonstrates the success of the study in laying a solid foundation for future exploration of the topic in bachelor thesis projects, facilitating further improvements and experimentation to develop the most effective tool possible.

While the comparison groups may not have been perfect, clear assessments of the

sample's scores across various levels could still be made. The inclusion of norm group categories within the measurements proved invaluable, allowing for the interpretation of scores and their relevance to the population, even without a direct comparison group. However, it is important to incorporate diverse norm groups to account for different influences and achieve the most accurate predictions regarding an individual's lifestyle or well-being.

Despite the study's numerous limitations and challenges, it can be considered a success. The valuable feedback received provides ample room for improvement. Rather than aiming for a flawless tool right from the start, the objective was to assess whether the study was heading in the right direction and to utilize the feedback to enhance the questionnaire until it becomes a truly effective tool.

Future Implications

In light of these findings, it's crucial to take recommendations into account in order to improve future research's ability to gain insight. Comparing measurements made within the UT population at various times is one such strategy. We can learn more about the dynamics and variables affecting mental health outcomes by looking at the changes and variances across time within the same group. When using merely a comparison with external groups over a short period of time, it may be difficult to spot trends, patterns, and probable contributing variables. However, this longitudinal view makes it possible. This strategy can help us better understand the mental health of the population and how it relates to the instrument being utilized, resulting in more thorough and insightful study findings.

It is advised that the University of Twente collaborate together with lifestyle coaches in the future to determine their interests in physical exercise. The University of Twente ought to investigate whether or not the IPAQ questionnaire, which assesses physical activity over the previous seven days, effectively captures people's patterns of physical activity over a longer time frame.

One important recommendation is to carefully choose questions that align with the UTAUT theory and the acceptance variable based on empirical evidence. Conducting thorough literature reviews will enhance the accuracy and reliability of identifying factors of acceptance. Another suggestion is to explore alternative dependent variables beyond willingness to participate again. Additionally, it is essential to investigate the underlying mechanisms that

influence acceptance levels rather than assuming that willingness to participate predicts it. Delving into factors such as individual motivations and circumstances will provide deeper insights into the acceptance process.

References

- Ács, P., Veress, R., Rocha, P., et al. (2021). Criterion validity and reliability of the International Physical Activity Questionnaire – Hungarian short form against the RM42 accelerometer. *BMC Public Health*, 21(Suppl 1), 381. <https://doi.org/10.1186/s12889-021-10372-0>
- Andersen, H. R., & Mayerl, J. (2019). Responding to Socially Desirable and Undesirable Topics: Different Types of Response Behaviour? *Semantic Scholar*, 13(1), 29. <https://doi.org/10.12758/mda.2018.06>
- Bakker, A. B., Schaufeli, W. B., Leiter, M. P., & Taris, T. W. (2008). Work engagement: An emerging concept in occupational health psychology. *Work & Stress*, 22(3), 187-200.
- Beck, A., Crain, L. A., Solberg, L. I., Unützer, J., Maciosek, M. V., Whitebird, R. R., & Rossom, R. C. (2014). The effect of depression treatment on work productivity. *The American Journal of Managed Care*, 20(8), e294-301. PMID: 25295792; PMCID: PMC4214368.
- Berry, N., Lobban, F., Emsley, R., & Bucci, S. (2016). Acceptability of Interventions Delivered Online and Through Mobile Phones for People Who Experience Severe Mental Health Problems: A Systematic Review. *Journal of Medical Internet Research*, 18(5), e121. <https://doi.org/10.2196/jmir.5250>
- Caruso, C. C. (2014). Negative impacts of shiftwork and long work hours. *Rehabilitation nursing*, 39(1), 16-25.
- Chadi, A., & Hetschko, C. (2016). Flexibilization without hesitation? Temporary contracts and job satisfaction. *Oxford Economic Papers-new Series*, 68, 217-237. <https://doi.org/10.1093/OEP/GPV053>.
- Charter, R. A. (2010). Sample Size Requirements for Precise Estimates of Reliability, Generalizability, and Validity Coefficients. *Journal of Clinical and Experimental Neuropsychology*, 21(4), 559–566. <https://doi.org/10.1076/jcen.21.4.559.889>
- Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), *The social psychology of health* (pp. 31–68). Newbury Park, CA: Sage.

- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24(4), 385–396. <https://doi.org/10.2307/2136404>
- Donovan, R. J., & Jalleh, G. (2002). Positive and negative affective outcomes of occupational stress. *New Zealand Journal of Psychology*, 31(1), 25-32.
- Dwivedi, Y., Rana, N., Chen, H., & Williams, M. (2011). A Meta-analysis of the Unified Theory of Acceptance and Use of Technology (UTAUT). https://doi.org/10.1007/978-3-642-24148-2_10.
- Ewa Wilczek-Rużyczka, & Justyna Wyszzyńska-Michalec. (2023). LEVEL OF OCCUPATIONAL BURNOUT, PERCEIVED STRESS AND LIFE SATISFACTION AMONGST UNIVERSITY TEACHERS. *Acta Neuropsychologica*. <https://actaneuropsychologica.com/resources/html/article/details?id=236036&language=en>
- Faber, J., & Fonseca, L. M. (2014). How sample size influences research outcomes. *Dental Press Journal of Orthodontics*, 19(4), 27–29. <https://doi.org/10.1590/2176-9451.19.4.027-029.ebo>
- Fontana, L., Dolce, P., Santocono, C., Annarumma, M., & Iavicoli, I. (2023). Validation of the NIOSH Worker Well-Being Questionnaire in Italian Language. *Journal of occupational and environmental medicine*, 65(6), e402–e412. <https://doi.org/10.1097/JOM.0000000000002835>
- Foster, J., & Canfield, M. (n.d.). Predictors of hazardous drinking among home drinkers. *Taylor and Francis Online*. <https://www.tandfonline.com/doi/full/10.1080/14659891.2017.1296040>
- Fowler, G. (2005). An Analysis of Higher Education Staff Attitudes in A Dynamic Environment. *Tertiary Education and Management*. <https://doi.org/10.1007/S11233-005-0367-9>.
- Grimm, P. E. (2010). Social desirability bias. *Wiley International Encyclopedia of Marketing*. <https://doi.org/10.1002/9781444316568.wiem02057>
- Guruprakash, K., Mehta, S., Atul, B., Prakash, J., Divinakumar, K., Khan, S., & Patra, P. (2018). A study of relationship between perceived stress, coping pattern, burnout, and general

- psychopathology among the postgraduate medical students. *Industrial Psychiatry Journal*. https://doi.org/10.4103/ipj.ipj_20_18.
- Hagströmer, M., Oja, P., & Sjöström, M. (2006). The International Physical Activity Questionnaire (IPAQ): A study of concurrent and construct validity. *Public Health Nutrition*, 9(6), 755-762. doi:10.1079/PHN2005898
- Hammen, C. (2005). Stress and depression. *Annu. Rev. Clin. Psychol.*, 1, 293-319.
- Harvey, S. B., Øverland, S., Hatch, S. L., Wessely, S., Mykletun, A., & Hotopf, M. (2018). Exercise and the prevention of depression: Results of the HUNT cohort study. *American Journal of Psychiatry*, 175(1), 28-36.
- Henderson, M., Glozier, N., & Elliott, K. H. (2005). Long term sickness absence. *BMJ*, 330(7495), 802-803.
- Hennekam, S., Richard, S., & Grima, F. (2020). Coping with mental health conditions at work and its impact on self-perceived job performance. *Employee Relations: The International Journal*. <https://doi.org/10.1108/er-05-2019-0211>.
- Howard, J. (2017). Nonstandard work arrangements and worker health and safety. *American journal of industrial medicine*, 60(1), 1-10.
- Huang, F., Wang, H., Wang, Z. et al. (2020). Psychometric properties of the perceived stress scale in a community sample of Chinese. *BMC Psychiatry*, 20, 130.
- Human Resources [UT]. (2023). *EMPLOYEE WELL-BEING ACTION PLAN 2023-2025*. Utwente.nl.<https://www.utwente.nl/.uc/fbc5aeefb0102f9cb4601cbac520354d32417edb5200a00/2023-2025%20employee%20wellbeing%20action%20plan.pdf>
- Jans-beken, L. (2019). The Relationship of Spiritual Coping with Resilience and Perceived Stress: Validation of the Dutch Spiritual Coping Questionnaire. *Spiritual Psychology and Counseling*, 4(2), 93-108.
- Judge, T. A., Thoresen, C. J., Bono, J. E., & Patton, G. K. (2001). The job satisfaction–job performance relationship: A qualitative and quantitative review. *Psychological Bulletin*, 127(3), 376–407.

- Keyes, C. L. (2007). Promoting and protecting mental health as flourishing: a complementary strategy for improving national mental health. *American psychologist*, 62(2), 95.
- Khodaveisi, M., Azizpour, B., Jadidi, A., & Mohammadi, Y. (2021). Education based on the health belief model to improve the level of physical activity. *Physical Activity and Nutrition*.
- Klimavergleich: Iran / Niederlande. (n.d.). Laenderdaten.info.
<https://www.laenderdaten.info/klimavergleich.php?r1=iran&r2=niederlande>
- Kouvonen, A., Vahtera, J., Oksanen, T., Pentti, J., Vänskä, J., & Heponiemi, T. (2013). Chronic workplace stress and insufficient physical activity: A cohort study. *Occupational and Environmental Medicine*, 69(1), 2-8.
- Lee, M., Hudson, H., Richards, R., Chang, C., Chosewood, L. C., & Schill, A. L. (2016). *Fundamentals of Total Worker Health approaches: essential elements for advancing worker safety, health, and well-being*. <https://doi.org/10.26616/nioshpub2017112>
- Lennefer, T., Lopper, E., Wiedemann, A. U., Hess, U., & Hoppe, A. (2020). Improving employees' work-related well-being and physical health through a technology-based physical activity intervention: A randomized intervention-control group study. *Journal of Occupational Health Psychology*, 25(2), 143–158.
- Lerner, D., & Henke, R. M. (2008). What does research tell us about depression, job performance, and work productivity? *Journal of Occupational and Environmental Medicine*, 50(4), 401-410.
- Leso, V., Fontana, L., Caturano, A., Vetrani, I., Fedele, M., & Iavicoli, I. (2021). Impact of shift work and long working hours on worker cognitive functions: current evidence and future research needs. *International journal of environmental research and public health*, 18(12), 6540.
- Lieu, J., & Dewan, K. (2010). Assessment of self-selection bias in a pediatric unilateral hearing loss study. *Otolaryngology–Head and Neck Surgery*, 142, 427 - 433.
<https://doi.org/10.1016/j.otohns.2009.11.035>.

- Lovejoy, M., Kelly, E. L., Kubzansky, L. D., & Berkman, L. F. (2021). Work redesign for the 21st century: Promising strategies for enhancing worker well-being. *American Journal of Public Health*, 111(10), 1787-1795.
- Madigan, R., Romano, R., Dziennus, M., Graindorge, T., Ortega, E., Graindorge, M., & Merat, N. (2016). Acceptance of Automated Road Transport Systems (ARTS): an adaptation of the UTAUT model. *Transportation Research Procedia*, 14, 2217–2226.
<https://doi.org/10.1016/j.trpro.2016.05.237>
- Makhubela, M. (2022). Assessing psychological stress in South African university students: Measurement validity of the Perceived Stress Scale (PSS-10) in diverse populations. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*, 41(5), 2802–2809. <https://doi.org/10.1007/s12144-020-00784-3>
- Marikyan, D. & Papagiannidis, S. (2021). Unified Theory of Acceptance and Use of Technology: A review. In S. Papagiannidis (Ed), *TheoryHub Book*.
- McManus, S., Bebbington, P., Jenkins, R., & Brugha, T. (2016). Mental health and wellbeing in England: Adult psychiatric morbidity survey 2014. NHS Digital.
- Mensah, A. (2021). Job stress and mental well-being among working men and women in Europe: The mediating role of social support. *International Journal of Environmental Research and Public Health*, 18(5), 2494.
- Noorbakhsh, S., Shams, J., Faghihimohamadi, M. et al. (2018). Psychometric properties of the Alcohol Use Disorders Identification Test (AUDIT) and prevalence of alcohol use among Iranian psychiatric outpatients. *Subst Abuse Treat Prev Policy*, 13, 5.
- Oye, N., Iahad, N., & Rahim, N. (2014). The history of UTAUT model and its impact on ICT acceptance and usage by academicians. *Education and Information Technologies*.
<https://doi.org/10.1007/s10639-012-9189-9>.
- Park, H., Lee, M., & Lee, K. (2017). Employment precariousness and depressive symptoms: A longitudinal study of South Korean workers. *International Journal of Environmental Research and Public Health*, 14(4), 386.

- Peters, E. (2022). *The Lifestyle Check: Improving employee well-being at the UT* [BA Thesis]. University of Twente.
- Phases | Phases of the CeHRes roadmap | EHealth *University of Twente*. (2019, April 30). Universiteit Twente. <https://www.utwente.nl/en/bms/ehealth/cehres-roadmap-toolkit/cehres-phases/>
- Pilkonis, P., Yu, L., Dodds, N., Johnston, K., Lawrence, S., & Daley, D. (2016). Validation of the alcohol use item banks from the Patient-Reported Outcomes Measurement Information System (PROMIS).. *Drug and alcohol dependence*. <https://doi.org/10.1016/j.drugalcdep.2016.02.014>.
- Porru, F., Burdorf, A., Robroek, S. J., Schaufeli, W. B., & Alavinia, S. M. (2014). Job stress and burnout among medical residents in Russia. *International Archives of Occupational and Environmental Health*, 87(8), 935-942.
- Prasetya, A., Purnama, D., & Prasetyo, F. (2020). Validity and Reliability of The Perceived Stress Scale with RASCH Model. . <https://doi.org/10.12928/PSIKOPEDAGOGIA.V8I2.17903>.
- Rahmati, A., & Ghasemi, S. R. (2019). The mediating role of self-efficacy and burnout in the relationship between job stress and job satisfaction among the staff of a military hospital. *Journal of Military Medicine*, 21(9), 1030-1037.
- Razavi, M. A., & Bahrampour, S. (2016). Occupational stress and its related factors among male employees of a major car manufacturing company in Iran. *Journal of Research in Health Sciences*, 16(4), 189-193.
- Richtlijnen Goede Voeding*. (n.d.). SamenGezond. <https://www.samengezond.nl/richtlijnen-goede-voeding/>
- Roberti, J. W., Harrington, L. N., & Storch, E. A. (2006). Further Psychometric Support for the 10-Item Version of the Perceived Stress Scale. *Journal of College Counseling*, 9(2), 135–147. <https://doi.org/10.1002/j.2161-1882.2006.tb00100.x>

- Rosch, P. J. (2001). The quandary of job stress compensation. *Journal of Occupational and Environmental Medicine*, 43(1), 1-3.
- Salehi, M., Kimiagar, S., Shahrabaki, M. E., & Khosravi, A. (2015). Determining the effect of stress on glycemic control in type 2 diabetes patients. *Iranian Red Crescent Medical Journal*, 17(12), e23670.
- Sarris, J., Logan, A., Akbaraly, T., Amminger, G., Balanzá-Martínez, V., Freeman, M., Hibbeln, J., Matsuoka, Y., Mischoulon, D., Mizoue, T., Nanri, A., Nishi, D., Ramsey, D., Rucklidge, J., Sánchez-Villegas, A., Scholey, A., Su, K., & Jacka, F. (2015). *Nutritional medicine as mainstream in psychiatry.. The lancet. Psychiatry*.
[https://doi.org/10.1016/S2215-0366\(14\)00051-0](https://doi.org/10.1016/S2215-0366(14)00051-0).
- Schaufeli, W. B., Bakker, A. B., & Van Rhenen, W. (2009). How changes in job demands and resources predict burnout, work engagement, and sickness absenteeism. *Journal of Organizational Behavior*, 30(7), 893-917.
- Schenk, A., Hunziker, M., & Kienast, F. (2007). Factors influencing the acceptance of nature conservation measures--a qualitative study in Switzerland. *Journal of environmental management*. <https://doi.org/10.1016/J.JENVMAN.2006.01.010>.
- Schueller, S. M. (2018). Mental health and eHealth technology. In *eHealth Research, Theory and Development* (1st ed.). <https://doi.org/10.4324/9781315385907-5>
- Schulte, P., & Vainio, H. (2010). Well-being at work—overview and perspective. *Scandinavian journal of work, environment & health*, 422-429.
- Schulte, P. A., Guerin, R. J., Schill, A. L., Bhattacharya, A., Cunningham, T. R., Pandalai, S. P., ... & Stephenson, C. M. (2015). Considerations for incorporating “well-being” in public policy for workers and workplaces. *American journal of public health*, 105(8), e31-e44.
- Shakerian, M., Khademalhosseini, Z., Vafaenasab, M. R., & Sadeghi, R. (2018). The mediating role of workplace bullying in the association between job stress and turnover intention among hospital nurses. *Iranian Journal of Psychiatry*, 13(1), 30-35.
- Shirom, A. (2005). Reflections on the study of burnout. *Work & Stress*, 19(3), 263-270.

- Spinhoven, P., Ormel, J., Sloekers, P. P. A., Kempen, G. I. J. M., Speckens, A. E. M., & Van Hemert, A. (1997). A validation study of the Hospital Anxiety and Depression Scale (HADS) in different groups of Dutch subjects. *Psychological Medicine*, 27(2), 363–370. <https://doi.org/10.1017/s0033291796004382>
- Springate, S. D. (2012). The effect of sample size and bias on the reliability of estimates of error: a comparative study of Dahlberg's formula. *The European Journal of Orthodontics*, 34(2), 158-163.
- Suhail, K., & Akram, M. W. (2021). The influence of job stress and job burnout on job satisfaction and turnover intention. *Pakistan Journal of Medical Sciences*, 37(2), 411-416.
- Suryadinata, R., Wirjatmadi, B., Adriani, M., & Lorensia, A. (2020). Effect of age and weight on physical activity. *Journal of Public Health Research*. <https://doi.org/10.4081/jphr.2020.1840>
- Tayfur, E., Elmas, E., Tayfur, İ., & Akar, İ. (2020). The impact of perceived job stress on job satisfaction among employees in the Turkish hotel industry: *A research on front office departments*. *Journal of Tourism and Gastronomy Studies*, 8(2), 861-879.
- Tehrani, H., & Solhi, M. (2021). Effects of work stress on burnout among Iranian emergency medical technicians: The mediating role of occupational self-efficacy. *Iranian Red Crescent Medical Journal*, 23(2), e116855.
- Teo, T., & Noyes, J. (2014). Explaining the intention to use technology among pre-service teachers: a multi-group analysis of the Unified Theory of Acceptance and Use of Technology. *Interactive Learning Environments*. <https://doi.org/10.1080/10494820.2011.641674>.
- Tugade, M. M., & Fredrickson, B. L. (2007). Regulation of positive emotions: Emotion regulation strategies that promote resilience. *Journal of Happiness Studies*, 8(3), 311-333. <https://doi.org/10.1007/s10902-006-9015-4> Lerner

- UK comparisons with other countries* | Drinkaware. (2016, April 9). Drinkaware.
<https://www.drinkaware.co.uk/research/research-and-evaluation-reports/comparisons>
- Vandelanotte, C., De Bourdeaudhuij, I., Philippaerts, R., Sjöström, M., & Sallis, J. F. (2005). Reliability and Validity of a Computerized and Dutch Version of the International Physical Activity Questionnaire (IPAQ). *Journal of Physical Activity and Health*, 2(1), 63–75. <https://doi.org/10.1123/jpah.2.1.63>
- Van der Klink, J. J. L., Blonk, R. W. B., Schene, A. H., & van Dijk, F. J. H. (2001). The benefits of interventions for work-related stress. *American Journal of Public Health*, 91(2), 270-276. doi: 10.2105/ajph.91.2.270
- Van Gemert-Pijnen, J. E., Nijland, N., van Limburg, M., Ossebaard, H. C., Kelders, S. M., Eysenbach, G., & Seydel, E. R. (2011). A holistic framework to improve the uptake and impact of eHealth technologies. *Journal of Medical Internet Research*, 13(4): e111.
- Van Gils, Y., Franck, E., Dierckx, E., Van Alphen, S. P. J., Saunders, J. B., & Dom, G. (2021). Validation of the AUDIT and AUDIT-C for hazardous drinking in community-dwelling older adults. *International Journal of Environmental Research and Public Health*, 18(17), [9266].<https://doi.org/10.3390/ijerph18179266>
- Wedlock, B. C., & Trahan, M. P. (2019). Revisiting the Unified Theory of Acceptance and the Use of Technology (UTAUT) Model and Scale: An Empirical Evolution of Educational Technology. *Research Issues in Contemporary Education*, 4(1), 6-20.
- Well-being for employees*. UT. (n.d.). Retrieved February 28, 2023, from <https://www.utwente.nl/en/service-portal/health-safety/health/well-being/well-being-for-employees>
- Wilkowska, W., & Ziefle, M. (2011). Perception of privacy and security for acceptance of E-health technologies: Exploratory analysis for diverse user groups. 2011 5th International Conference on Pervasive Computing Technologies for Healthcare (PervasiveHealth) and Workshops. <https://doi.org/10.4108/ICST.PERVASIVEHEALTH.2011.246027>.

World Health Organization. (2020). Mental health and psychosocial considerations during the COVID-19 outbreak. WHO.

World Health Organization. AUDIT: The Alcohol Use Disorders Identification Test—Guidelines for Use in Primary Care; *World Health Organization, Department of Mental Health and Substance Dependence*: Geneva, Switzerland, 2001

World Health Organization. (2021). WHO/ILO joint estimates of the work-related burden of disease and injury, 2000–2016: *global monitoring report*

Wright, T. A., & Bonett, D. G. (2007). Job satisfaction and psychological well-being as nonadditive predictors of workplace turnover. *Journal of Management*, 33(2), 141-160. doi: 10.1177/0149206306297582

Appendix A

Table 2

Demographic data PSS comparison sample (Wilczek-Rużyczka, & Wyszyńska-Michalec, 2023)

Characteristic	PSS sample score			
	N	Mean	SD	%
Age	67	45	8.92	
Gender				
Female	24			35.82
Male	43			64.18
Other	0*			0
Job seniority				
Male		19.2	9.12	
Female		15.8	9.42	

Appendix B

Table 5

Summary alcohol use UT

Min.	1 st Quartile	Median	Mean	3 rd Quartile	Max.
0.00	1.00	3.00	3.7	5	15

Table 6

AUDIT control group (Forster & Canfield, 2017)

Characteristic	n	%	AUDIT total score mean (SD)
Gender			
Female	268	58.5	7.88(5.37)
Male	190	41.5	9.53 (4.56)
Age			
<20	101	22.1	11.25 (6.27)
20-29	126	27.5	9.13 (4.98)
30-39	102	22.3	7.60 (3.85)
40-49	95	20.7	7.15 (3.36)
50 and over	34	7.4	

Appendix C

Table 8

Demographics PAC comparison group (Khodaveisi et al., 2021)

Characteristic	N (Mean)	%	SD
Gender			
Female	27	41.5	
Male	38	58.5	
Age	(40.72)		9.36
Height	(169.98)		7.14
Weight (kg)	(74.03)		11.12
BMI	(25.61)		3.52

Table 9

Physical activity scores control group

Group	Mean	SD	Statistical test results
Control	3648.30	4760.72	P=0.977

Appendix D

Table 10

T-test results per construct

	Sample estimates	T (df)	SD	P-value	CI
Stress	Prob. of success 0.56	/	6.63	0.00	
Physical activity	2777.66	-3.72(96)	2307.95	0.00	[2312.50, 3242.81]
AUDIT	3.7	-15.82(99)	3.16	< 2.2	[3.073, 4.33]