

The Effect of Lifestyle Coaching on Stress Reduction: A Mixed-Methods Study

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Abstract

This mixed-methods study evaluates the effect of lifestyle coaching provided by Topvorm Twente in reducing perceived stress among students and employees at the University of Twente. Guided by the Stress-Buffering Hypothesis and the Transactional Model of Stress and Coping, it aims to determine the impact of lifestyle coaching on stress reduction. The hypothesis proposes that lifestyle coaching can significantly reduce perceived stress. A longitudinal within-subjects design was utilised involving 12 participants who completed the Perceived Stress Scale at baseline, four weeks, and eight weeks. A subset of three participants took part in semi-structured interviews. Quantitative analysis using linear mixed-effects model revealed no significant reduction in perceived stress over time ($p = .93$). However, thematic analysis identified themes of increased motivation, personalised feedback, and stress awareness, suggesting potential benefits not captured by the PSS. Technical and logistical challenges were noted as areas for improvement. These findings highlight the importance of mixed-methods approaches in understanding the nature of stress and the impact of lifestyle coaching, indicating the need for tailored interventions. Future research should include larger samples, longer duration study periods, and objective stress measures to further evaluate the effectiveness of lifestyle coaching in reducing stress.

Keywords: lifestyle coaching, stress reduction, mixed-methods, university students, university employees

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Introduction

Stress is a multifaceted concept that varies significantly across different disciplines. In psychology, stress is often viewed as the perception of threat, leading to anxiety, discomfort, and difficulty in adjustment (Epel et al., 2018). Furthermore, stress can range from experiencing minor daily challenges, like the pressure to perform well, to severe traumatic events, such as the death of a colleague or peer. Hans Selye, who first defined stress in a psychological context in 1936, described it as "the nonspecific response of the body to any demand" (Selye, 1976, p. 13). Depending on the potential impact of stress on well-being, it can be categorised into "good stress" (eustress) and "bad stress" (distress) (Gong & Geertshuis, 2023). According to Choukèr (2020) three main types of stress can be defined which are positive stress, tolerable stress, and toxic stress. Positive stress involves manageable challenges that foster growth and resilience. Tolerable stress refers to adverse events buffered by supportive relationships, while toxic stress is characterised by prolonged and unbuffered adversity. This can severely impact brain architecture and physiological systems, increasing the risk of lifelong physical and mental disorders (Guidi et al., 2020; McEwen, 2017). For the purposes of this study, distress and toxic stress will be categorized as "negative stress" due to their detrimental effects on both physical and mental well-being.

The limbic system and the hypothalamic-pituitary-adrenal (HPA) axis in the brain play a crucial role in the stress response. The limbic system is responsible for identifying and assessing threats, while the HPA axis initiates the "fight or flight" response through the release of stress hormones like cortisol and adrenaline (Squire, 2009). Chronic activation of these mediators can result in allostatic load or allostatic overload. Allostatic overload occurs when an individual's ability to cope with environmental difficulties is surpassed (Choukèr, 2020; Guidi et al., 2020). This is a situation when the stress response systems are frequently triggered such as experiencing toxic stress in daily life and buffering mechanisms are insufficient. Overall, leading to negative health outcomes like cardiovascular disease, weakened immune function, and mental health disorders (Guidi et al., 2020; McEwen & Wingfield, 2010).

Factors such as life experiences, genetics, lifestyle habits (e.g., sleep, diet, exercise), and early life adversity significantly influence an individual's stress response and overall health. The brain also regulates the manifestations of stress including heart palpitations, sweating, dry mouth, shortness of breath, fidgeting, and accelerated speech (American Psychological Association, 2018;

Chu et al., 2022). Behavioural responses include avoidance behaviour, where individuals avoid places or activities that they associate with previous stress, immobilisation or freezing in response to a perceived threat, panic-like responses, hypervigilance, and learned helplessness (Akirav & Maroun, 2007; Hoffman et al., 2022; Kimble et al., 2014; Maier & Seligman, 2016).

1.1 Prevalence

Negative stress is a pervasive problem that affects a wide range of groups and has become an increasingly important topic today. Several recent studies have demonstrated that people of varying demographics and geographical locations experience considerable amounts of stress that has been exacerbated by factors including the COVID-19 pandemic, economic uncertainty, and ongoing conflicts (Adamson et al., 2020; Barbayannis, 2022; Salari et al., 2020).

In a mental health survey from the European Commission (2023), it was highlighted that 46% of the 26501 participants (EU citizens, 15 years and over), have experienced an emotional or psychosocial problem, such as feeling stressed or anxious, in the past twelve months. Particularly in the Netherlands, a study conducted between November 2022 and January 2023 by Caring Universities, 9048 university students from seven Dutch universities completed an online questionnaire assessing psychological problems using validated scales such as the Patient Health Questionnaire-9 for depression, the Generalized Anxiety Disorder-7 for anxiety, and the Perceived Stress Scale-10 for stress (Struijs, 2023). The study found that 35.9% of students reported moderate to severe mood complaints, 21.8% reported moderate to severe anxiety complaints, and 77% reported moderate to severe stress complaints.

The increasing prevalence of stress in the workplace is a global concern. The 2022 Cigna 360 Global Well-Being Survey revealed that 87% of employees worldwide report feeling stressed, with one in three experiencing symptoms of burnout (Cigna, 2022). This high prevalence of work-related stress not only impacts individual well-being but also has significant implications for productivity, absenteeism, and overall organisational performance (Cigna, 2022). This self-reported survey data can offer valuable insights into stress trends, but it is important to consider potential limitations to the reliability.

1.2 Stress in Relation to Students and University Employees

University students experience a significant amount of stress. They encounter several academic difficulties which increase stress, including a demanding course load, intensive studying,

effective time management, classroom competition, financial worries, familial expectations, and adjusting to a new environment (Barbayannis, 2022; Reddy et al., 2018). Moreover, the findings of a recent study conducted on 843 students suggest that academic stress is highly related to psychological well-being among the students who completed the Short Warwick-Edinburgh Mental Well-Being Scale and the Perception of Academic Stress Scale. Overall, Barbayannis et al. (2022) found a significant negative correlation between perceived academic stress and mental well-being in college students, suggesting that as academic stress increases, mental well-being decreases. Notably, some groups of students are more stressed than others, emphasising individual differences and the importance of support (Barbayannis, 2022).

University employees face significant stress from multiple sources. The stress experiences by employee's arises mainly from a hypercompetitive environment, overwhelming e-mail correspondence, and student evaluations (Ross et al., 2023). Additionally, stressors from executive decisions, funding cuts, and increased teaching loads contribute to a negative impact of education quality, well-being, and productivity (Netherlands Labour Authority, 2024; Ross et al., 2023). Furthermore, a recent report by the Netherlands Labour Authority (2024) revealed that over half of university staff in the Netherlands experience high work pressure, with one in five reporting burnout symptoms. According to Ross et al. (2023), these challenging conditions highlight the importance for effective coping strategies, adaptation, and resilience among the academics. Effective coping strategies include professional training, supportive work environments, clear career progression opportunities, and stress management programmes (Ahmad et al., 2022). Providing these resources can help reduce the negative impact of stress and improve the overall well-being of university teachers (Ahmad et al., 2022).

These findings highlight the need for effective interventions that significantly reduce stress among university students and employees. A recent study at the University of Twente (UT) found that while general satisfaction was high, employees reported high levels of strain and workload, particularly among academic staff (de Leede & Fisher, 2022). Although work-life balance improved slightly in the final assessment, approximately one-third of employees still struggled with maintaining a healthy balance. These results underscore the importance of addressing workplace stressors and promoting well-being initiatives within university settings.

Given the significant stress experienced by both students and university employees, as shown by the aforementioned research, it is crucial to explore effective interventions that can

mitigate these negative impacts on well-being and performance. Lifestyle coaching has emerged as one such promising approach, with growing evidence supporting its efficacy in stress reduction and other related domains.

1.3 Previous Research on Lifestyle Coaching

Previous research highlights the effectiveness of lifestyle coaching in reducing perceived stress and other domains. According to Clark et al. (2014), coaching showed significant improvements in all areas, including overall quality of life, depressive symptoms, and perceived stress levels, after participants followed a 12-week program. Importantly, these improvements were also maintained at the 24-week follow-up. This study provides quantitative evidence for the effectiveness of wellness coaching in improving psychosocial well-being. A scoping review by Bishop et al. (2018) further supports the potential of lifestyle coaching for mental health. The review found that coaching interventions led to positive outcomes such as symptom reduction, development of coping strategies, and improved physical health. These findings suggest that lifestyle coaching may be a valuable approach for enhancing mental well-being and overall quality of life. Another quantitative study which supports the effectiveness of coaching on stress has been done by Traut-Mattausch et al. (2021). In this study a cognitive-behavioural stress management coaching program was examined, which is based on Lazarus TMSM. Overall, it was concluded that cognitive-behavioural stress management coaching is an effective method to improve stress management and coping skills (Traut-Mattausch et al., 2021).

A recent study during the COVID-19 pandemic revealed that lifestyle coaching could effectively address various health-related outcomes, including stress (Janssen et al., 2024). Even though the improvements were small but significant, it highlights the effectiveness of lifestyle coaching particular under challenging conditions like the pandemic. The study does not specify the exact mode of delivery for the intervention. However, the study does mention that some participants started the intervention digitally, while others started in person, and most received a combination of digital and in-person sessions. In general, most studies agreed that coaching improves individuals' well-being, quality of life, and has potential to serve as a robust stress management programme by promoting clients' self-efficacy and coping skills. (Ammentorp et al., 2013; Clark et al., 2014; Ebner et al., 2018; Gordon et al., 2016; Graßmann et al., 2019; Wang et al., 2021).

Further studies support these findings. Blackwell et al. (2019) found that an eight-week health and wellness one-on-one coaching program led by undergraduate trainees resulted in significant improvements in participants self-reported wellness scores, also highlighting the interest of the participants to work on stress reduction. This suggests that even a short-term coaching programme can positively impact well-being, potentially reducing stress. Second, Ogakwu et al. (2023) demonstrated that occupational health coaching, a type of lifestyle coaching, significantly reduced job stress in technical college teachers in Nigeria. While not being completely representative for this study context, this suggests that lifestyle coaching interventions can be effective in mitigating work-related stress. Overall, lifestyle coaching can effectively support individuals in making lasting, positive changes in their lives (Bailey, 2019; Blackwell et al., 2019; Bulmer et al., 2021; Oliver, 2020; Traut-Mattausch et al., 2021). Lifestyle coaches employ many strategies to assist individuals with diverse personalities and specific challenges, some common strategies include goal setting, self-awareness, and behaviour modification techniques

However, one randomised controlled trial examining the effect of coaching on psychological adjustment to illness and health-related quality of life in patients with spinocerebellar degeneration (the gradual deterioration of the cerebellum), found no significant improvement in these outcomes after the intervention (Izumi et al., 2007). Nevertheless, the study did find a significant increase in self-efficacy within the intervention group during the follow-up period (Izumi et al., 2007). The aforementioned findings were gathered from individuals with illnesses, whereas this study primarily incorporates healthy individuals.

In summary, lifestyle coaching can effectively support individuals in making lasting, positive changes in their lives, utilising various strategies such as goal setting, self-awareness, and behaviour modification techniques to address diverse needs and challenges (Bailey, 2019; Blackwell et al., 2019; Bulmer et al., 2021; Oliver, 2020; Traut-Mattausch et al., 2021).

1.4 Topvorm Twente's Lifestyle Coaching Programme

Topvorm Twente, a physical therapy practice with multiple locations in Enschede and Lattrop, offers lifestyle coaching services in collaboration with the University of Twente. However, currently there is only limited availability for students. Whereas employees are invited to participate in the lifestyle check throughout the year. In the near future Topvorm Twente has plans to expand and offer the lifestyle check to all students. This check serves as an initial assessment of an individual's overall health and well-being, encompassing physical fitness, mental health, and

potential lifestyle-related risks. Registration is facilitated through the UT's website, prompting a confirmation e-mail and a calendar invitation.

Prior to the 60-minute lifestyle check, participants complete two online questionnaires designed to assess their current lifestyle and health habits. During the appointment itself, trained professionals, including Technical Medicine students, collect various physical measurements such as blood pressure, heart rate, and body composition. The check ends in a discussion with a lifestyle coach, during which the results are analysed, and personalised goals are established. Participants have the option to schedule follow-up sessions to further support their health and well-being journeys.

The term "lifestyle coaching" is not a protected term and anyone can call themselves a life coach. There is no specific licensure or certification required to practice as a lifestyle coach. This is also the case for Topvorm Twente. However, most lifestyle coaches underwent some training or licensing in one or more areas, for instance, psychology, goal setting, mindfulness, self-awareness, and behaviour modification techniques, to raise their chances of getting hired and increase experience (International Coaching Federation, 2022). Overall, lifestyle coaches help individuals in adopting long-term lifestyle changes that enhance their well-being as well as quality of life. Moreover, different lifestyle coaching institutions have various definitions, which usually all share similarities. While Topvorm Twente does not have its own lifestyle coach definition, they identify most with the definition set by the National Center for Complementary and Integrative Health (NCCIH). The description entails lifestyle coaching as part of a holistic approach to health, which focuses on integrating physical, behavioural, and social support to treat the whole person (NCCIH, 2021).

Traut-Mattausch et al. (2021) found that a cognitive-behavioural stress management coaching (CBSM) program was effective in reducing chronic stress levels and improving cognitive stress appraisal in undergraduate students. This suggests that lifestyle coaching, particularly with a cognitive-behavioural approach, can be a valuable tool for stress management. Bailey (2019) suggests that lifestyle coaching can be a valuable tool for facilitating health behaviour change by assisting individuals in setting and achieving goals. The author emphasises that goal setting is a crucial strategy for identifying specific behaviours to change and developing a plan to achieve those changes.

Goal setting is a multifaceted concept that has been extensively researched across various disciplines and is a common part of the lifestyle coaching at Topvorm Twente. It involves a person's confidence, commitment, motivation, and knowledge to attain specific, measurable, achievable, relevant, and time-bound (SMART) goals (Bailey, 2019; Eckhoff & Weiss, 2020).

Self-awareness is crucial for personal growth and development. Coaches help clients increase their self-awareness through reflective practices, journaling, and feedback goals (Bulmer et al., 2021). This process involves understanding one's strengths, weaknesses, emotions, and behaviours. Being more self-aware helps people to make informed decisions through alignment with their values and goals (Bulmer et al., 2021). Another tool that is utilised by Topvorm Twente are behaviour change techniques, which can be used to limit undesirable behaviours and promote positive behaviours. Techniques such as positive reinforcement, habit tracking, and cognitive restructuring can be utilised to assist the client adapting health habits and identify behaviours that do not serve them (Oliver, 2020).

To better understand the mechanisms through which lifestyle coaching can influence stress and well-being, this study draws upon two theoretical frameworks.

1.5 Theoretical Framework

Two theories are particularly relevant for this study. Firstly, according to the Stress-Buffering Hypothesis developed by Cohen and Wills (1985), the relationship between social support and wellbeing is more likely to be explained by the general positive benefits of support as well as the way in which support protects individuals from potentially harmful impacts of stress. Essentially, the idea posits that establishing a robust network of support can enhance individuals' ability to handle stress and ultimately enhance their well-being. Not only professionals can provide benefiting social support but friends, family, coworkers, and even internet communities can all be sources of social support that can significantly reduce stress (Hostinar & Gunnar, 2015; Vila, 2021). The Stress-Buffering Hypothesis has been greatly researched across several fields (e.g. psychology, medicine, sociology, and education), and provides a solid theoretical framework (Bowen et al., 2014; Cohen & Wills, 1985; Gellert et al., 2018; Hostinar & Gunnar, 2015; Vila, 2021). This theory has important implications for lifestyle coaching, as recognising the importance of social support and effectively integrating it can significantly help clients in reaching their goals and increase their well-being.

Secondly, while the Stress-Buffering Hypothesis emphasises the protective function of social support, the Transactional Model of Stress and Coping (TMSC) offers a more dynamic perspective on the stress process itself (Lazarus & Folkman, 1984). Moreover, the TMSC states that stress is a result of an interaction (transaction) between an individual and their environment (Lazarus & Folkman, 1984). The stress response depends on the individuals' appraisals of the stressor and their resources to cope with it. The primary appraisal evaluates if the situation is a threat, challenge, or irrelevant. If a situation is seen as a threat or challenge, the secondary appraisal assesses available coping resources and options. Based on this, individuals engage in coping strategies aimed at managing the stressor or reducing emotional distress (Lazarus & Folkman, 1984). The TMSC is widely recognised in stress research and provides a valuable framework for understanding how individuals perceive and cope with stress, highlighting the importance of individual differences, personal resources, and coping strategies (Lazarus & Folkman, 1984; Zeigler-Hill & Shackelford, 2019).

1.6 Research Gap

Despite the promising findings regarding the effectiveness of lifestyle coaching for stress management, significant gaps remain in the literature. Most studies have focused on quantitative data only, highlighting the gap in qualitative data regarding the effectiveness of lifestyle coaching on stress. Only measuring quantitative data limits the depth of understanding regarding the personal experiences and nuanced outcomes of lifestyle coaching. Moreover, there are no studies available, as of the time this research was conducted, which investigate lifestyle coaching among the university employees and students. As a result, the current study addresses this gap by investigating the effect of lifestyle coaching among students and staff at the UT. Particularly, by providing a mixed-methods study of the lifestyle coaching conducted by Topvorm Twente seeking to offer a more holistic understanding of how lifestyle coaching impacts stress. Additionally, this study provides insights on how lifestyle coaching can benefit academic populations due to its setting. This research provides a unique contribution to the field of literature, by being the first to evaluate the effect of lifestyle coaching within Topvorm Twente.

1.7 Research Objectives and Hypotheses

The primary objective of this study is to evaluate the effect of lifestyle coaching in reducing perceived stress levels among university students and employees at the UT. The study is guided by

the null and alternative hypothesis. The null hypothesis posits that lifestyle coaching has no effect on perceived stress levels among participants. Next, the alternative hypothesis posits that lifestyle coaching significantly reduces perceived stress levels among participants. Additionally, the qualitative component of this study aims to explore the experiences and perceptions of participants regarding lifestyle coaching and its impact on their stress levels, satisfaction with the coaching, areas of improvement regarding the lifestyle coaching, and overall well-being.

This research will contribute to the field of Health Psychology and Technology by providing additional literature of lifestyle coaching and its effectiveness related to stress. It is expected that the finding could lead to improvements of the lifestyle coaching programme at Topvorm Twente, ensuring a better experience for their clients in enhancing their well-being and quality of life.

Method

2.1 Study Design

This research was approved by the Ethics Committee from the Faculty of Behavioural, Management, and Social Sciences (BMS), Domain of Humanities and Social Sciences (HSS). This longitudinal mixed-methods study utilises a within-subjects design to evaluate the effectiveness of lifestyle coaching on stress reduction among university students and employees. Furthermore, quantitative data from the standardised survey data was combined with the qualitative data from semi-structured interviews over an eight-week period.

2.2 Participants

For this study the following inclusion criteria applied: (a) being aged 18 years or older, (b) being a student or employee at the UT, (c) having enrolled in the Topvorm Twente lifestyle coaching program during the study period, and (d) voluntarily agreeing to participate in the study as well as completing the informed consent process. The study sample consisted of 12 participants who were enrolled in the lifestyle coaching and stress management study. The participants were adults aged between 22 and 45 years old ($M = 32.5$, $SD = 7.1$), comprising three students and nine employees. Of these participants, five were male (41.7%), and seven were female (58.3%). The participants nationalities included eight Dutch (66.7%), two German (16.7%), one Mexican (8.3%), and one Indian (8.3%) individuals.

2.2.1 Sampling Procedures

Participants were recruited through Topvorm Twente. The company shared a secured, weekly updated, Excel document containing the information of 51 potential participants who had signed up for the lifestyle coaching. These individuals were then contacted via e-mail, where they were invited to participate in the study. The e-mail explained the study procedure and included a link to a consent form and baseline PSS questionnaire in Qualtrics (<https://www.qualtrics.com>).

2.2.2 Sample Size and Power

An initial power analysis was performed using G*Power (3.1.9.7) to estimate the sample size needed for a repeated measures ANOVA, targeting an effect size of 0.25, alpha level of 0.05, and power of 0.80. This analysis suggested a sample size of 28 participants. However, the final sample consisted of 12 participants. Given this smaller sample, a linear mixed-effects model (LMM) was deemed more appropriate to analyse the longitudinal data, as it can accommodate unbalanced designs. It is important to note that the power calculations based on the repeated measures ANOVA may not fully apply to the LMM.

2.3 Materials

2.3.1 Primary and Secondary Measures

The PSS was used to measure perceived stress in the participants (Cohen et al., 1983). The PSS was designed to assess the degree to which situations in one's life are appraised as stressful (Cohen et al., 1983). Participants indicated their frequency of experiencing stress-related feelings and thoughts over the past month on a 5-point Likert scale ranging from “never” to “very often.” An example item is “In the last month, how often have you felt nervous and stressed?”

The PSS has demonstrated strong reliability and validity across various studies. For instance, a study validating the PSS in a Greek sample reported high internal consistency with a Cronbach's alpha of .82, indicating excellent internal reliability (Andreou et al., 2011). Additionally, a review of psychometric properties by Lee (2012) indicated that the PSS has consistently shown Cronbach's alpha values above .70 across multiple studies, further confirming its reliability. In this current study, a Cronbach's alpha of .86 was reported, reinforcing the high internal consistency of the scale. The scale's hypothesis testing validity has been supported through significant correlations with related constructs such as anxiety and depression (Lee, 2012).

A qualitative component was incorporated to gain deeper insights into participants experiences with the lifestyle coaching sessions and their perceived impact on stress management. The secondary measure included a semi-structured interview for participants who indicated interest in further discussing their overall experience, impact on stress, expectations, needs, and suggestions of improvements. Example questions are “Can you describe your overall experience with the lifestyle coaching sessions?” and “To what extent were your expectations met through the coaching sessions?”

2.4 Procedure

The PSS was administered at three intervals: baseline, at four weeks following, and eight weeks from baseline. Importantly, the baseline measure was taken before the first lifestyle coaching took place. The questionnaires were distributed via Qualtrics (<https://www.qualtrics.com>), and participants received an e-mail with a link to the baseline Qualtrics survey, that included the consent form and the initial PSS questionnaire. Participants who voluntarily agreed to the consent were able to provide their e-mail addresses in the baseline questionnaire, enabling follow-up surveys to be sent directly to their inbox.

Four weeks later, participants received a second e-mail with the second PSS questionnaire and a question about their willingness to participate in a follow-up interview. Interested participants were contacted via e-mail to schedule a semi-structured interview, which was conducted online via Microsoft Teams (24124.2315.2911.3357). These interviews covered experiences with lifestyle coaching, impact on stress, meeting expectations, goal setting, and suggestions for improvement. Eight weeks after the baseline, the final PSS survey was distributed via e-mail, concluding the data collection phase. Overall, the data collection began on March 22, 2024, and ended on June 14, 2024.

2.5 Data Analysis

The data were anonymised to protect participant confidentiality, and any identifying information was removed. Furthermore, the data from the questionnaires were inspected for completeness and accuracy. No data transformations were necessary as the PSS scores were normally distributed. Quantitative data were processed and analysed using RStudio (4.3.0). Descriptive statistics were calculated for the PSS scores at each time point. Next, the LMM was

conducted to evaluate changes in stress levels over the three time points (baseline, four weeks, eight weeks). Qualitative data from the interviews were analysed using ATLAS.ti (24.1.1).

A hybrid thematic analysis approach, integrating both inductive and deductive methodologies as guided by Braun and Clarke (2006), was employed to identify common themes and insights from the participants' experiences. This approach acknowledges the value of both data-driven exploration and theory-informed inquiry. The initial inductive analysis involved actively engaging with the interview transcripts to identify potential themes. This process entailed thoroughly and repeatedly reviewing the data, gradually uncovering patterns, and recurring ideas. As the analysis progressed, the understanding of these themes was continuously refined, comparing them to new information and adjusting interpretations as needed. Throughout this iterative process, a reflexive approach was maintained. This was done to ensure that the analysis captured the nuances and complexities of participants experiences.

The first step was to get familiarised with the data, which involved transcribing the interviews verbatim and reading them multiple times to ensure a good understanding. Initial impressions were captured through highlighting and commenting relevant segments that stood out. Additionally, nonverbal communication, including facial expressions, was examined through analysis of the video recordings. This was done to get a better understanding of important and significant themes expressed by the participants throughout the interview. The next step was to use ATLAS.ti, to generate initial codes and themes. This involved systematically highlighting and labelling text segments that appeared meaningful or relevant to the research questions. Both semantic and latent content were coded. Here it was important to remain open to unexpected themes which was driven by the data.

Following the first round of coding, the codes were analysed and organised according to possible themes. Finding patterns and coherence in the codes was part of this process.

During this phase, the focus was on how different codes could be combined to form overarching themes that captured significant aspects of the data. An initial network map was created to visualise these relationships which facilitated better understanding and identifying patterns. To guarantee their accuracy and comprehensiveness, the preliminary themes underwent an evaluation and refinement procedure. This was done by employing a two-step approach. First, the coherence of coded data extracts within each theme was checked that all supporting evidence aligned with the thematic interpretation. Next, themes were refined, merged, or discarded based on their relevance

and representativeness. The goal was to create distinct, non-overlapping themes that provided a comprehensive understanding of the data.

Finally, code groups were generated capturing multiple codes in one overarching theme. This was done by defining and name the code group to reflect the essence of what the codes represented. Comments were included for the codes to better describe and explain them, but also to not get confused by different codes and their meaning.

Results

3.1 Quantitative Results

3.1.1 Data Inspection and Cleaning

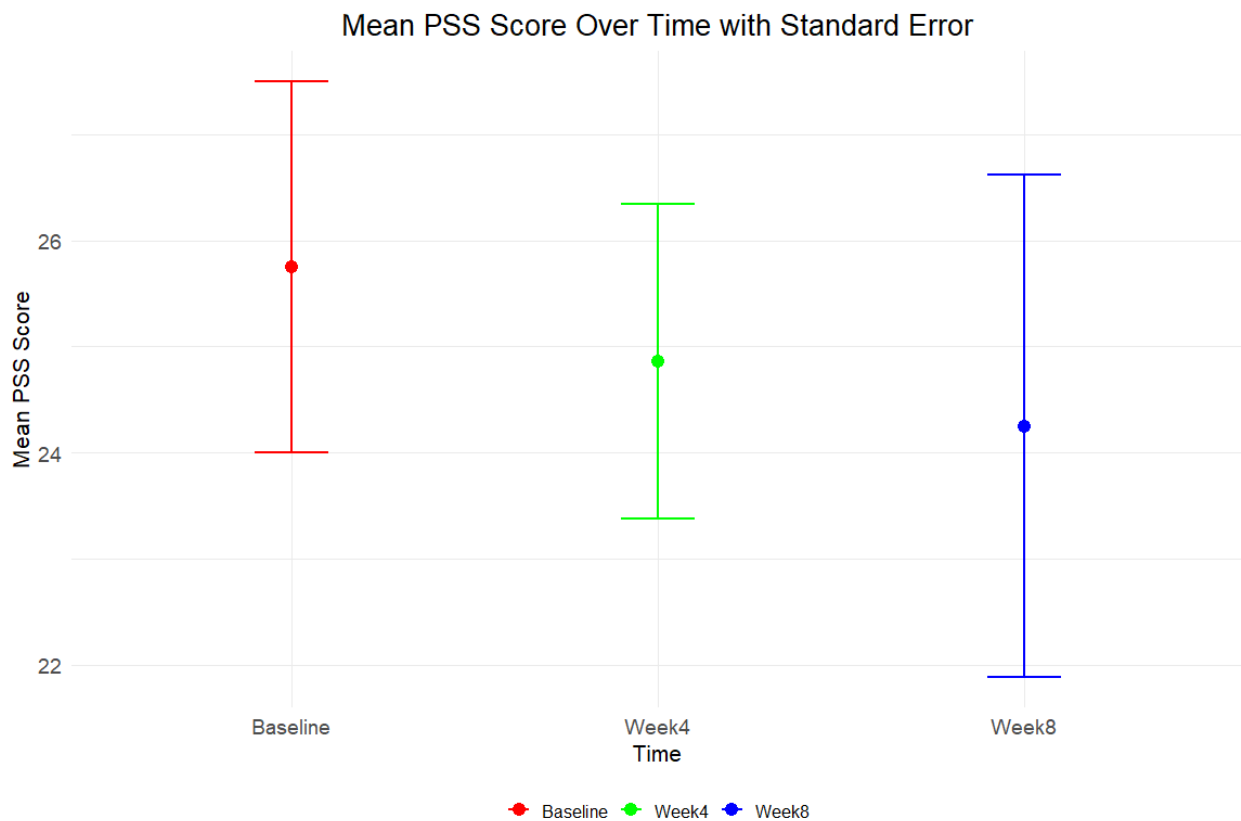
Each dataset contained responses from different numbers of participants, with each response comprising 14 items measuring perceived stress. Initially, the datasets were cleaned and inspected for completeness. To handle the varying number of participants at different time points (12 participants at baseline, seven participants at four weeks, and eight participants at eight weeks), a LMM was used. The questions of the PSS were scored on a scale from 0 to 4, where "Never" = 0, "Almost Never" = 1, "Sometimes" = 2, "Fairly Often" = 3, and "Very Often" = 4. After reversing the scores on the positively stated items (4, 5, 6, 7, 9, 10, and 13), the total score for each participant was calculated by adding up all items. The total scores can range from 0 to 56, where higher total scores correspond to higher levels of perceived stress. This provided a quantitative measure of perceived stress.

Three participants reported significant life events (e.g., annual work evaluation, infection, intense therapy session) during the study period. These events were captured in response to the question: "Has anything happened/Were there any life events that may have affected your stress levels beyond what is expected?" Initially, this question was added to filter out cases that had significant events. However, due to the low response rate these cases were not excluded. The descriptive statistics are shown in Table 1, where a decrease in the mean scores can be observed. This decrease can also be seen in Figure 1, which includes the standard error of the mean.

Table 1*Descriptive Statistics*

Time Point	Mean	SD	Min	Max
Baseline	25.8	6.1	16	33
Four Weeks	24.9	5.1	18	31
Eight Weeks	24.2	8.2	13	35

Note. The descriptive statistics presented in the table represent the mean, standard deviation (SD), minimum (Min), and maximum (Max) scores for each time point. Baseline $n = 12$, Four Weeks $n = 7$, Eight Weeks $n = 8$

Figure 1*Mean PSS Score Over Time with Standard Error*

Note. The figure displays the mean (PSS scores at Baseline, Week 4, and Week 8 with standard error bars). The error bars represent the standard error of the mean.

3.1.2 Parametric Assumptions

The Shapiro-Wilk test confirmed that the PSS scores at each time point were normally distributed ($p > .05$). Furthermore, the Levene's test indicated homogeneity of variance ($p = .32$).

Whereas further visual inspection of scatterplots and Q-Q plots suggested approximate linearity and normality of the residuals. Therefore, the parametric assumptions of normality, homogeneity of variances, and linearity were met, allowing the use of parametric tests in subsequent analyses.

3.1.3 Linear Mixed-Effects Model

Due to intermittent missing data points across participants and time points, a LMM was employed to examine the potential influence of time (baseline, four weeks, eight weeks) on perceived stress scores. The analysis did not reveal a statistically significant main effect of time on perceived stress, $F(2, 15.29) = 0.07, p = .93$. Given the non-significant main effect, post hoc tests were not conducted to explore differences between specific time points.

3.2 Qualitative Results

In the qualitative analysis, both inductive and deductive approaches were employed to identify themes within the interview data of the three participants (two employees and one student). Inductive codes, such as "Continuation of current practices," and "Technical issues," were derived directly from the participants narratives, reflecting their experiences during the coaching sessions.

Deductive codes were identified through the lens of the TMSC. Two core concepts of the TMSC are primary appraisal (the initial assessment of a stressor) and secondary appraisal (the evaluation of one's resources and coping options). These concepts were particularly relevant in interpreting codes like "Changing expectations" and "Increased stress awareness." For instance, the code "Changing expectations" reflects the evolving nature of participants' primary appraisals of the coaching sessions. Similarly, the code "Increased stress awareness" aligns with the TMSC's concept of primary appraisal. Participants reported that the coaching sessions prompted them to reflect on their stress levels and identify specific stressors.

3.2.1 Presentation of Themes

Table 2

Overview of Identified Themes with Representative Quotes

Theme	Description	Representative Quotes
Positive Experiences and Motivation	Participants positive impact from coaching sessions and motivation derived from them.	"It's very good. I use it when I can. For me, it's very motivating." (Participant 2)

Expectations and Personalisation	Evolution of expectations and the value of personalised feedback.	"In my experience the tests are more shorter and shorter... they want to... have a pleasant consumer experience or something." (Participant 3); "But in the last years it was way more personalised... the last experiences were good." (Participant 3)
Stress Awareness and Management	Increased awareness of stress levels and effective stress management strategies.	It was more of a kind of a wakeup call so to say because I was in a certain routine and I forgot a little bit about the stress and anxiety that I experienced but he so to say called that back so that I learned not really learnt." (Participant 1); "I think just like by answering the questions you might be considering your stress levels... it might already help to be more aware." (Participant 3); "I do sports regularly. I have enough. I make sure I take enough really free time." (Participant 3)
Technical and Logistical Aspects	Feedback on the organisation of the sessions and technical issues encountered.	"I find it they organise it well... every time again... they still tell you I'm doing this. This will happen with your data." (Participant 2); "The only thing that went wrong... when I answered all these well-being questions they were not in the system on Monday." (Participant 3)

Goal Setting and Practical Advice	Goal setting process and practical advice provided during the sessions.	"Yeah, we discuss what the goals are and then he writes them down so I can more easily keep it in mind." (Participant 2); "They really give me practical advice for both breakfast and for air fryer recipes." (Participant 2)
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Note. Representative quotes are slightly edited for clarity and length.

Positive Experiences and Motivation

Participants mentioned multiple times the positive impact of the lifestyle coaching on their motivation and highlighted the satisfaction with their coaching experiences. For example, Participant 2 noted that the sessions were "very motivating" and helped them stay engaged, due to the structured goal-setting process, and the flexibility to adapt goals over time. In addition, they noted an increased sense of control gained in managing their lifestyle.

Participant 3 also found the sessions beneficial, highlighting the helpfulness of the lifestyle coach in remembering and acting on goals. They appreciated the practical advice and guidance received, stating, "It's good to get some advice because it's very practical." Particularly in the areas of exercise (using the group lessons at the university), nutrition (changing their breakfast routine to healthier choices), and stress management (focus more on how they were feeling and what their body needed). Additionally, the satisfaction of viewing the sessions as a beneficial and effortless part of their routine encouraged them to return annually, noting, "Well I find it a very good initiative so I'm participating every year more or less like nothing."

Expectations and Personalisation

Multiple Participants brought up that before attending the lifestyle coaching sessions for the first time they had low or no expectations, due to unfamiliarity with the concept or scepticism about the potential benefits of lifestyle coaching. However, Participant 1 was positively surprised how the coaching sessions turned out.

As participants engaged with the coaching process, their initial low expectations evolved into more concrete expectations shaped by their positive experiences. The absence of initial expectations or having low expectations appeared to foster a positive engagement with the lifestyle coaching process. Potentially due to participants' increased openness to new experiences and a

greater willingness to experiment with and adopt new behaviours. To further illustrate, Participant 2, who had participated in multiple sessions, initially had no specific expectations due to not knowing what to expect, stating, "No, not having a good idea at the start what we can expect, like how detailed and how knowledgeable are the people." However, they later expressed satisfaction with the personalised advice they could try to improve their health, stating, "it is a very practical advice, lots of things I can try."

Participant 1 underscored the importance of having their expectations met and even surpassing them, noting, "So I got more out of it than I went into." Also, Participant 3 highlighted the shift in the lifestyle coaching sessions towards a more consumer-friendly and personalised experience. This is in contrast with earlier "health checks" from a couple of years ago that felt more extensive and did not leave much time for the actual coaching and goal setting. Since Topvorm Twente constantly improves their services, Participant 3 noted that the sessions have become shorter, prioritising a "pleasant consumer experience". While they found the previous format with technical details informative, they acknowledged that the current discussions are "organised in a better way" and offer more personalised feedback (see Table 2).

Stress Awareness and Management

A common theme that was represented by all participants, was the increased awareness of stress and the benefits of the coaching to manage stress. The participants noted that the lifestyle coaching helped them to recognise and manage their stress levels more effectively. In the interview, Participant 1 explained that they were aware of their stress and anxiety but had become accustomed to it. The coaching session served as a reminder, or as they said, "wakeup call", of its presence and negative impact. Thus, the reminder prompted them to actively address the stressor.

Specifically, Participant 1 said, "I was in a certain routine, and I forgot a little bit about the stress and anxiety that I experienced, but he ... so to say, called that back so that I learned ... to focus a little bit more on that feeling...." While Participant 3 highlighted the effectiveness of the pre-questionnaires and the questions during the session of promoting stress awareness and being more mindful (see Table 2). Additionally, Participant 2 expressed some frustration when strategies did not work but acknowledged to keep adjusting the goals till satisfaction and reduced stress is achieved, noting, "I really tried to do the things they recommend and then I'm very frustrated and disappointed and more stressed when it doesn't work." The participant did not share any specific insights into why some of the strategies were ineffective for them or whether they thought their

goals were unrealistic. They did not express that the strategies were not helpful but rather focused on finding and utilizing the strategies that were effective in managing their stress.

Technical and Logistical Aspects

While participants generally expressed appreciation for the structured approach and content of the coaching sessions, Participant 2 highlighted the well-organised process from signing up for a lifestyle coaching session, being well guided throughout the session, to scheduling a new appointment (see Table 2). However, two technical difficulties were encountered, Participant 3 mentioned experiencing repeated cancellations and having to refill questionnaires due to technical errors:

Because I answered the questions like the first time for my first interview, but that had to be cancelled and then I And I already got the request so evaluate my meeting although it was cancelled and then the second one was cancelled because the person doing the test was sick and that's OK. I mean no problem. But then I had to then I had to fill in a list again.

Additionally, they noted that their responses did not appear in the system of Topvorm Twente during the session, hindering the coach's ability to provide personalised feedback. They stated, "When I answered all these well-being questions, they were not in the system on Monday."

Goal Setting and Practical Advice

With goal setting being an integral part of the lifestyle coaching, resulting in participants valuing the practical advice provided, and setting realistic, relevant, and achievable goals. This was highlighted by Participant 1 focusing on health-related goals, mentioning, "The goal was to learn and try to focus a little bit more on how you are feeling and what your body needs." Additionally, Participant 2 appreciated the dietary advice offered by one of the lifestyle coaches and valued the collaborative approach to goal setting, noting that having their aspirations documented in their own words and provided in a printed format served as a helpful reminder to keep on track (see Table 2).

The goal setting process, however, was not without its challenges. Participant 1 expressed a desire for more concrete goals and a follow-up session to track progress and make adjustments, indicating a need for greater structure and accountability, noting, "The one station that I had the goal was to learn and try to focus a little bit more on how you're feeling and what your body needs to drink, water and eating that kind of stuff and it wasn't that concrete." Additionally, while Participant 2 appreciated the dietary advice received, they noted that the sessions primarily focused

on physical health, neglecting other aspects of well-being that could contribute to stress reduction, stating, "But it is already a lot of knowledge for, say, the physical part, but for the mental part. Yeah, it might be nice to have, I do not know something more there, but I do not know concretely what."

Discussion

4.1 Summary of the Findings

This study aimed to evaluate the effect of lifestyle coaching on reducing perceived stress levels among those who participated in lifestyle coaching over an eight-week study period using a mixed-methods approach. Quantitative data was collected using the PSS at three time points (baseline, four weeks, and eight weeks), while qualitative was gathered through semi-structured interviews after filling out the PSS at four weeks.

The results of the quantitative analysis, using a LMM, showed the changes in stress levels were not statistically significant. Despite the downward trend in the PSS scores, the lifestyle coaching did not lead to a significant reduction in perceived stress over the eight-week period.

The thematic analysis used for the qualitative findings, resulted in a more nuanced understanding of participants experiences with the lifestyle coaching. Overall, the participants expressed overall satisfaction with the lifestyle coaching itself. More importantly, they were also satisfied with the personal results they achieved through the coaching. While some participants highlighted the increase in motivation, others emphasised the value of personalised feedback. A common theme was the development of stress awareness and management strategies through coaching sessions. However, some participants encountered technical difficulties with online questionnaires, getting false reminders of filling out evaluations and questionnaires, as well as questionnaire data not showing during the lifestyle coaching. In general, the participants appreciated the structured approach and practical advice provided during the sessions, although some participants desired more personalised advice, follow-up sessions, and a broader focus on well-being beyond physical health.

4.2 Interpretation and Explanation of Findings

The quantitative findings of this study, indicating no significant reduction in perceived stress following lifestyle coaching, contrast with previous research that has generally shown

positive effects of coaching on stress reduction (Clark et al., 2014; Traut-Mattausch et al., 2021; Janssen et al., 2024). Several factors may explain this discrepancy.

The small sample size ($n = 12$) potentially has limited the study's statistical power to detect significant changes. Additionally, the eight-week study period may be too short for participants to experience and report significant reductions in perceived stress. The Stress-Buffering Hypothesis (Cohen & Wills, 1985) and the TMSC (Lazarus & Folkman, 1984) suggest that stress reduction involves developing coping skills, enhancing social support, and reframing perceptions of stressors, processes that may require more time than eight weeks. Research by Clark et al. (2014) and Gordon et al. (2017) demonstrated significant stress reductions after 12-week interventions, underscoring the potential benefits of a longer study duration for fostering lasting change in perceived stress. While the eight-week intervention period may have been insufficient to observe significant changes in perceived stress, it is plausible that the positive effects of lifestyle coaching on coping skills and stress awareness could lead to reduced perceived stress over a longer period.

The wide range of PSS scores at the eight-week time point (13-35) suggests individual differences may have contributed to the variability in outcomes. Differences in stress perception, coping mechanisms, and receptiveness to coaching are potential factors (Barbayannis, 2022). Barbayannis et al. (2022) found that men were less likely to report increased stress compared to women, emphasising the role of individual differences in stress perception. Moreover, coaching may be particularly beneficial for individuals with low self-efficacy and self-empowerment (Ammentorp et al., 2013), suggesting that responses to lifestyle coaching vary depending on self-efficacy, self-empowerment, and life stage (e.g., student vs. employee).

While the quantitative findings did not align with previous research, the qualitative findings highlight the positive impact of lifestyle coaching on motivation, personalized feedback, and stress awareness (Ammentorp et al., 2013; Ebner et al., 2018; Graßmann et al., 2019; Wang et al., 2021). Participants emphasised the value of personalized feedback and increased stress awareness, supported by the Stress-Buffering Hypothesis (Cohen & Wills, 1985) and the TMSC (Lazarus & Folkman, 1984). These theories suggest that social support and coping skills, which are fostered through lifestyle coaching, can buffer the negative effects of stress and improve well-being.

Although the PSS offers a valid and reliable assessment of perceived stress, it might miss the nuanced shifts in participants stress awareness, coping strategies, and motivation. Gibbons (2022) suggests that the General Health Questionnaire, like the PSS, may not fully capture the

dynamic interplay between perceived stress, coping mechanisms, and motivation due to its focus on distress as opposed to eustress, or beneficial stress. Rahe and Jansen (2022) further highlight this limitation by demonstrating that the Perceived Stress Questionnaire, which is similar to the PSS, may not fully capture the nuances of stress related to specific contexts, such as the academic stress experienced during the COVID-19 pandemic. Additionally, the inclusion of the PSS alongside Topvorm Twente's existing questionnaires, such as the My Positive Health Survey and the Questionnaire UT Lifestyle Survey, may have introduced redundancy and potentially led to survey fatigue, influencing participants' responses.

While lifestyle coaching can help people to achieve better coping mechanisms, and stress management techniques, it takes time to truly adapt one's behaviour to incorporate these mechanisms and techniques. Heffer and Willoughby (2017) suggest that further research is needed to understand the factors that influence the use of coping strategies and the differences between perceived use and actual use of coping strategies in real-life scenarios, implying that the successful implementation of coping mechanisms takes time and is not immediate.

The perception of stress is deeply rooted in personal beliefs, experiences, and environmental factors that may not change significantly within the eight-week study period. According to Huh et al. (2021), perceived stress is a subjective concept that refers to an individual's understanding of the amount of stress they are exposed to over time. The authors suggest that personal beliefs play a role in how stress is perceived. This view is further supported by Cantuaria et al. (2023), who suggest that individual perceptions and beliefs play a significant role in how environmental stressors are perceived and the resulting stress response.

The absence of a statistically significant effect on perceived stress does not negate the positive impacts reported in the qualitative data. The PSS primarily captures the cognitive appraisal of stress, which may not be the primary target of lifestyle coaching. As Wolever et al. (2012) suggest, mind-body interventions like mindfulness, which directly address cognitive appraisal, might be more effective in reducing PSS scores. Conversely, lifestyle coaching often focuses on behavioural changes, like goal setting and habit formation (Ammentorp et al., 2013). These changes, while potentially beneficial, may not immediately translate into changes in perceived stress as measured by the PSS.

The qualitative data revealed that participants encountered technical difficulties and session rescheduling, which likely impacted the effectiveness of the coaching intervention. These logistical

challenges disrupted the continuity and consistency of the coaching process. Also, these challenges may have affected the participants engagement and progress in stress reduction. For instance, issues such as system recognition problems and the need to repeatedly fill out questionnaires caused frustration and interruptions in the coaching flow. Overall, these challenges and biases may have influenced the outcomes of the lifestyle coaching especially regarding perceived stress.

4.3 Limitations

This study has several limitations that should be acknowledged when interpreting the findings. First, the small sample size ($n = 12$) for the quantitative part, and ($n = 3$) for the qualitative part limits the generalisability of the results. For the quantitative part, participant retention decreased over time, with only seven participants completing the four-week follow-up questionnaire and eight participants completing the eight-week follow-up questionnaire. This reduction in sample size over the study period may have impacted the statistical power of the analyses. Additionally, the sample size was smaller than the calculated required sample size ($n = 28$) for adequate statistical power, which may have affected the ability to detect significant changes in perceived stress. For the qualitative part, not all participants were interviewed, potentially missing important perspectives that could explain the quantitative data more comprehensively. The two employees and one student who completed the qualitative interviews were diverse in their roles and personality characteristics. Thus, suggesting no obvious pattern. However, it is possible that those who volunteered for the interviews had different motivations or experiences than those who did not participate. For example, individuals with strong opinions or positive experiences may have been more likely to participate.

Second, the study included biases and relied on self-reported measures of perceived stress. This may be subject to social desirability bias, halo effect, and recall bias. Social desirability bias refers to the tendency of individuals to respond in a way that they believe will be viewed favourably by others (Piedmont, 2014). In the context of this study, participants may have underreported their stress levels to avoid appearing weak or unable to cope. The halo effect and recall bias are two additional forms of reporting bias that may have affected the participants responses. Recall bias occurs when individuals have difficulty accurately remembering past events or experiences (Althubaiti, 2016). Because of this, it is possible that participants gave incomplete or inaccurate reporting when asked to reflect on their stress levels during the previous month. The influence of prior events or experiences may have been underestimated, while participants could have placed

too much emphasis on more recent ones (Althubaiti, 2016). Moreover, the halo effect refers to the tendency to let one's overall impression of a person or situation influence their judgments about specific aspects of that person or situation (Batres & Shiramizu, 2022). In this study the lifestyle coaching had generally a favourable impact on participants, therefore, the halo effect may have caused them to report lower stress levels. Essentially, the halo effect could mask the true impact of the intervention, the participants might unintentionally downplay any persistent stress they felt.

Third, this study lacks a control group, making it difficult to assess the effectiveness of lifestyle coaching on stress reduction. Because other factors that may have influenced participants stress levels are challenging to isolate. For instance, external factors such as personal life events, seasonal variations, and other stress reduction activities such as exercises, yoga, and spending time in nature could have influenced the results (Hunter et al., 2019; National Institute of Mental Health, 2020; Wolever et al., 2012).

Fifth, three participants reported experiencing significant life events during the study period (e.g., annual work evaluation, infection, intense therapy session). While these events could be considered potential confounding variables, their exclusion would have severely reduced the sample size, particularly at the four-week ($n = 4$) and eight-week ($n = 5$) follow-ups. Given the already small sample size ($n = 12$), retaining these participants was deemed necessary to maintain the study's feasibility, albeit at the cost of introducing potential confounding effects.

Sixth, the qualitative data analysis was conducted by a single researcher, which may have introduced some degree of subjectivity and bias into the interpretation of the data. In addition, the researcher participated in an internship at Topvorm Twente, which provided valuable insights into the lifestyle coaching process, but may have introduced potential biases in interpreting the results.

Lastly, this study faced a formal constraint that impacted the scope and depth of the research. Particularly, the master thesis was set to be completed within one semester. This made it challenging, due to the strict timeline on the research process, to gather extensive data and conduct a more comprehensive analysis. Overall, the eight-week period, while useful, was constrained by the need to complete all aspects of the study within the academic semester.

4.4 Directions for Future Research

Building upon the findings and limitations of this study, several directions for future research emerge. First, to increase the generalisability of the findings to other lifestyle coaching programmes, future studies should schedule a longer data collection period to allow a bigger

sample size. This will help in achieving sufficient statistical power and capturing a broader range of experiences and responses to lifestyle coaching and allow for a more comprehensive understanding of the effect of lifestyle coaching. In addition, when conducting a thematic analysis five interviews or lower is too small of a sample size (Braun & Clarke, 2013). It is recommended to have between 10 and 20 interviews for a master thesis utilising thematic analysis (Braun & Clarke, 2013).

Second, stress is a multifaceted and complex phenomenon characterised by environmental demands, internal psychological processes, and physical outcomes. Therefore, future research should consider extending the study period beyond eight weeks. It is advisable that longitudinal studies with follow-up periods that go beyond eight weeks would provide valuable insights into the long-term effects of lifestyle coaching on stress reduction, and perhaps capture multiple coaching sessions in that period. Furthermore, to address the limitations of self-reported measures and gain a more holistic understanding of the effects of lifestyle coaching, future research could investigate the following: (a) Does lifestyle coaching lead to significant reductions in anxiety and depression symptoms among university students and employees? (b) Do lifestyle coaching studies that incorporate objective measures of stress, such as cortisol levels and heart rate variability, demonstrate a significant reduction in physiological stress responses compared to interventions relying solely on self-reported measures? Additionally, future studies could explore the impact of lifestyle coaching on physical health markers and overall well-being, providing a more comprehensive view of the potential benefits.

Third, for future studies, adding a control group would help to better isolate the effects of lifestyle coaching on stress reduction and strengthen the internal validity of the findings. This would provide further insight into attributing observed changes directly to the coaching intervention and controlling for external factors. Implementing a randomized controlled trial, with participants randomly assigned to either a lifestyle coaching group or a control group, would be an effective approach. The intervention group would receive the lifestyle coaching program, while the control group would not. Both groups should be assessed for stress symptoms at baseline and at follow-up intervals (e.g., 3, 6, and 12 months). To ensure adequate statistical power, the sample size should ideally exceed 20 participants per group at each measurement point.

Forth, to address the limitations of self-reported measures, future research should incorporate objective measures of stress, such as physiological markers. These include measuring

cortisol levels through saliva or blood samples and assessing heart rate variability (HRV) using wearable devices like electrocardiogram (ECG) monitors or heart rate sensors. Cortisol is a hormone released in response to stress, and its levels can provide a biological indication of stress that complements self-reported data (Kim et al., 2018). HRV, which refers to the variation in time intervals between heartbeats, is another valuable indicator, as lower HRV is often associated with higher stress levels (Kim et al., 2018). Utilising these physiological markers will allow for a more comprehensive assessment of stress reduction by providing objective data that can validate and enhance the findings from self-reported measures.

Fifth, future studies could employ multiple researchers, especially at least one independent researcher that is not attached to Topvorm Twente. This may reduce the possibility of bias in interpreting the results.

Sixth, future research could investigate the role of social support networks in lifestyle coaching. This is particularly compelling because, during the literature review, it became apparent that most existing research focuses primarily on the coaching process itself and its direct effect on the client (Gordon et al., 2016). However, while lifestyle coaching has been shown to significantly improve well-being, there are other crucial variables and factors that contribute to coping with stress and enhancing overall well-being. One major factor is social support networks, which play a vital role given the inherently social nature of humans (Drageset, 2021). Exploring how these networks interact with and enhance the benefits of lifestyle coaching could provide a more comprehensive understanding (Drageset, 2021). In particular, researching and integrating the Stress-Buffering Hypothesis further in future research would provide an opportunity to explore how family, friends, and community support enhance the effectiveness of coaching interventions, ultimately, leading to more comprehensive stress management programs.

4.5 Significant Contributions of the Study

Despite the limitations, this study makes several meaningful contributions to the field of lifestyle coaching and stress management research. First, it provides valuable insights into the experiences of university students and employees participating in a lifestyle coaching program, highlighting the perceived benefits of increased motivation, personalised feedback, and stress awareness. These findings contribute to the growing body of evidence supporting the positive impact of lifestyle coaching on various aspects of well-being (Ammentorp et al., 2013; Clark et al., 2014; Gordon et al., 2016; Janssen et al., 2024; NHLBI, 2005).

Second, this study focuses on a unique population and setting. By focusing on university students and employees at the UT, this research addressed a specific population that has not been extensively studied in the context of lifestyle coaching. This focus highlights the applicability and benefits of lifestyle coaching in an academic environment, providing insights that can be leveraged by other educational institutions seeking to implement similar studies (Barbayannis, 2022; Reddy et al., 2018). Additionally, the research that has been done at the UT highlights the high levels of strain the employees experience (de Leede & Fisher, 2022). Thus, the lifestyle coaching provided by Topvorm Twente may be an important factor when trying to improve the overall health of UT employees. This focus not only highlights the applicability and benefits of lifestyle coaching in an academic environment but also contributes to the field of service research by evaluating the effectiveness of a specific lifestyle coaching program within a university setting.

Third, this study employed a mixed-methods approach, combining quantitative and qualitative data to provide a more comprehensive understanding of the effects of lifestyle coaching on stress. This approach allowed for a deeper exploration of the mechanisms through which coaching may influence stress perception and management, beyond what can be captured by quantitative measures alone (Clark et al., 2014; Traut-Mattausch et al., 2021).

Fourth, the qualitative findings offered a nuanced understanding of participants' experiences with lifestyle coaching, emphasising the importance of personalised feedback, stress awareness, and practical advice. This contributes to the existing literature by illustrating how individualised coaching strategies can enhance stress management techniques and overall well-being (Ammentorp et al., 2013; Ebner et al., 2018).

Fifth, this study represents the first academic evaluation of the Topvorm Twente lifestyle coaching program, offering valuable insights for program improvement and refinement. The qualitative findings, in particular, highlight areas where the program could be enhanced, such as addressing technical difficulties and tailoring interventions to individual needs and preferences.

Sixth, the findings underscored the critical role of motivation and personalised feedback in lifestyle coaching. Participants reported increased motivation and satisfaction with personalised coaching sessions, suggesting that these elements are key drivers of effective stress management (Schuman-Olivier et al., 2020; Bulmer et al., 2021).

Finally, this study contributes to the ongoing discussion about the role of lifestyle coaching in promoting stress reduction and overall well-being in academic settings. The introduction

highlights several key discussions relevant to this topic. Primarily, the prevalence of stress among university students and employees is a significant concern, with numerous studies indicating high levels of stress and its detrimental impact on mental and physical health (Barbayannis, 2022; de Leede & Fisher, 2022; Netherlands Labour Authority, 2024; Reddy et al., 2018; Ross et al., 2023). In this context, effective interventions are crucial. Next, lifestyle coaching is a promising approach, offering personalised support and strategies to manage stress more effectively (Bailey, 2019; Blackwell et al., 2019; Ogakwu et al., 2023; Traut-Mattausch et al., 2021). This study's findings align, to a certain degree, with previous research suggesting that lifestyle coaching can improve stress management, particularly through goal setting and increased stress awareness. Therefore, the results of this study underscore the potential of lifestyle coaching as a valuable resource for university students and employees experiencing stress, providing them with tools and strategies to enhance their quality of life and overall well-being.

4.6 Practical Applications

The findings of this study have several practical applications for lifestyle coaching and stress management interventions in academic settings. First, the emphasis on personalised feedback and stress awareness highlights the importance of tailoring interventions to individual needs and preferences. In general, the personalised feedback and tailored strategies used in lifestyle coaching were well-received by participants. Highlighting that lifestyle coaches at the UT can utilise the insights from this study to develop more individualised coaching plans that address the specific stressors and coping mechanisms of university students and employees. By focusing on individual needs, coaches can provide more effective and relevant support, enhancing overall wellbeing.

Second, Educational institutions and workplaces can use these insights to create comprehensive stress management workshops that include elements of lifestyle coaching. At the UT, workshops can integrate goal setting, mindfulness, and self-awareness techniques, tailored to the academic environment. These workshops can be incorporated into student orientation programs and employee professional development sessions.

Third, while this study did not find a significant reduction in perceived stress, the qualitative findings highlight the potential benefits of lifestyle coaching in increasing motivation, personalized feedback, and stress awareness. These findings suggest that lifestyle coaching, when combined with other evidence-based interventions such as mindfulness training (Wolever et al., 2012) or cognitive-behavioural therapy (Traut-Mattausch et al., 2021), could be a valuable component of a

comprehensive approach to stress management and well-being promotion for university students and employees. The UT can utilise these findings to advocate for the integration of lifestyle coaching into existing support services and educational curricula, potentially enhancing the overall effectiveness of stress reduction efforts.

Finally, the study's mixed-methods approach demonstrates the value of combining quantitative and qualitative data to gain a more comprehensive understanding of the effects of lifestyle coaching. The UT can adopt this approach for future evaluations of the Topvorm Twente coaching program. This would involve regular assessments through surveys and in-depth interviews to continuously refine and improve the coaching services. Furthermore, this approach could be adopted by other researchers and coaching institutions to evaluate the effectiveness of similar studies and to develop evidence-based recommendations for practice.

4.7 Conclusion

This study aimed to evaluate the effectiveness of lifestyle coaching on reducing perceived stress levels among university students and employees at the UT through a mixed-methods approach. The primary research question addressed was whether lifestyle coaching significantly reduces perceived stress levels among participants. While the quantitative findings did not reveal a significant reduction in perceived stress following the intervention, the qualitative data highlighted the individual experiences of participants. Particularly, the benefits of increased motivation, personalised feedback, and increased stress awareness.

These findings suggest that while the PSS may not capture the full impact of lifestyle coaching, lifestyle coaching positively influences participants well-being. Future research should include a larger sample size, a longer study period, and objective stress measures to gain a more comprehensive understanding of the effects of lifestyle coaching on stress reduction.

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Appendix A

Perceived Stress Scale (PSS-14) developed by Cohen et al. (1983)

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them, and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:

0. Never
1. Almost never
2. Sometimes
3. Fairly often
4. Very often

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and “stressed”?
4. In the last month, how often have you dealt successfully with day-to-day problems and annoyances?
5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?
6. In the last month, how often have you felt confident about your ability to handle your personal problems?
7. In the last month, how often have you felt that things were going your way?
8. In the last month, how often have you found that you could not cope with all the things that you had to do?
9. In the last month, how often have you been able to control irritations in your life?

10. In the last month, how often have you felt that you were on top of things?
11. In the last month, how often have you been angered because of things that were outside your control?
12. In the last month, how often have you found yourself thinking about things that you have to accomplish?
13. In the last month, how often have you been able to control the way you spend your time?
14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Appendix B

Semi-structured Interview Guide

Introduction

Thank you for participating in this follow-up interview. The purpose is to understand your experience with the lifestyle coaching sessions and their impact on your stress levels. Also, whether your expectations and needs have been met.

Section 1: Experience with Lifestyle Coaching

1. Can you describe your overall experience with the lifestyle coaching sessions?
2. What were your initial expectations going into the coaching sessions?
3. How well do you feel the coaching sessions addressed your identified areas for improvement?

Section 2: Impact on Stress

4. Since participating in the coaching sessions, have you noticed any changes in your stress levels?
5. What strategies, if any, from the coaching sessions have you applied to manage your stress?

Section 3: Meeting Expectations and Needs

6. To what extent were your expectations met through the coaching sessions?
7. Was there anything missing from the sessions that you feel could have better addressed your needs?

Section 4: Goal Setting and Achievement

8. Can you talk about the goals you set during the coaching sessions? How did you progress towards these goals?
9. How did the coaching sessions assist you in setting or achieving these goals?

Section 5: Suggestions for Improvement

10. Do you have any suggestions for how the coaching sessions could be improved to better support participants in managing stress or meeting their needs?

11. Overall: Would you say that the lifestyle coaching was effective in reducing your stress levels (before and after)?

Closing

Thank you for sharing your experiences and insights.