



**Universiteit Utrecht**

Unplugged and Recharged: Unveiling the Enduring Effects of Social Media Detox on Sleep  
and Mental Well-being

Noury van der End

Master Thesis Social, Health and Organizational Psychology

Supervised by: Dr. Tim van Timmeren

Second reader: Laura Weiss

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## **Abstract**

Social media use has been on the rise, and it is associated with potential negative impacts on sleep quality and mental well-being. One approach to address this issue is through a social media detox, which aims to break the habit and raise self-awareness of social media use. There is a lack of research examining the longitudinal effects of a social media detox on sleep quality and mental well-being. Therefore, this study aims to investigate whether a one-week social media detox can improve sleep quality and mental well-being in the weeks following the detox. Although confirmative results were found for the positive effect of social media detox on sleep quality and mental well-being during the detox week itself, the results did not show any significant long-term effects of social media detox. In addition, the effect of the detox did not differ for large or small social media users. The data showed that participants continuously reduced their social media use in the first follow-up week and that some of the participants had not fully adhered to the detox. Therefore, the moderating effects of social media reduction and detox adherence were also examined. Results suggested that none of the moderators generated any changes in the effect of the detox. Considering the strengths and limitations of the present study, future research should reveal the precise interaction between social media use and the effects of the detox and explore other contributing factors that may explain the current findings.

*Keywords:* social media detox, sleep quality, sleep duration, mental well-being, social media usage

## Introduction

In recent years, social media use has continued to increase among the Dutch population. Social media are referred to as Internet-based applications that are used to exchange and explore user-generated content. In 2023, the percentage of social media users among the Dutch population over the age of 15 has increased to 79.0% compared to 72.4% in 2016 (Newcom Research & Consultancy, 2023). The numbers of users of all top 5 social media platforms (Whatsapp, Youtube, Facebook, Instagram, and LinkedIn), have increased in 2023 compared to 2022. In particular, the number of users on Instagram has increased the most with 6.6 million users in 2022 to 7.8 million users in 2020, which is an increase of 18% (Newcom Research & Consultancy, 2023). In addition, social media is used more frequently and for longer amounts of time in 2023 compared to 2022 (Newcom Research & Consultancy, 2023). In all age groups, people spend more minutes on social media in 2023 than in 2022. On average, people spend 114 minutes on social media in 2023, compared to 107 minutes in 2022, which is a growth rate of 6.5%.

Clearly, social media has become an almost indispensable part of daily life for many people. It is used for a variety of reasons, of which social interaction is the most considerable one (Whiting & Williams, 2013). Social media is a useful tool for maintaining social connections and fostering interaction with other people (Best, Manktelow, & Taylor, 2014), which supports our human need for social contact (Uhls, Ellison, & Subrahmanyam, 2017). In addition, it is used for exchanging information, relaxation and entertainment (Whiting & Williams, 2013).

Despite the positive aspects of social media, there is also a negative side to its use. The intensive use of social media is negatively associated with sleep quality (Bruni et al., Shochat, Flint-Bretler, & Tzischinsky, 2010) and mental well-being (Keles, McCrae, & Grealish, 2020). However, whether social media actually causes negative consequences for sleep quality and mental well-being is not yet clear. Poor sleep quality is common in adults (Leone et al., 2018) and has been linked to several mental health problems such as depression, anxiety and other psychiatric disorders (Alvaro, Roberts & Harris, 2013; Lovato & Gradisar, 2014; Kahn-Greene, Killgore, Kamimori, Balkin, & Killgore, 2007; Keles, McCrae, & Grealish, 2020). Given the large increase in the use of social media in recent years, the problems associated with it are likely to grow along with it. It is therefore of great importance to find interventions that people help to decrease social media use to improve sleep quality and mental well-being.

One promising intervention is the implementation of social media detox: the conscious interruption or restriction of the use of social media platforms exclusively (Radtke, Apel, Schenkel, Keller & von Lindern, 2022; Tromholt, 2016). Social media detox is shown to be a helpful tool to reduce social media use (Brown & Kuss, 2020) and improve cognitive and affective well-being (Tromholt, 2016). This arises the question: Can we improve sleep quality and mental well-being by implementing a one-week social media detox?

### **Sleep quality**

In the Netherlands, poor sleep quality is a growing public health concern. According to an extensive study at the Trimbos Institute, the amount of people who experience poor sleep quality is increasing in the Netherlands and appears to be a particular problem in adults: about one-sixth of adults experience poor sleep quality (Leone et al., 2018).

Sleep quality refers to the degree in which people subjectively judge the continuity and restfulness of their sleep and their perceived sleep disturbances such as insomnia, excessive daytime sleepiness and circadian rhythm disturbances (Alvaro et al., 2013). The National Sleep Foundation (NSF) indicates two important determinants of sleep quality: sleep continuity (falling asleep and staying asleep), and sleep efficiency (time in bed spent sleeping) (Ohayon et al., 2017).

### **The interplay between mental well-being, sleep and social media use**

Sleep quality is an important predictor of mental well-being: research linked aspects of mental well-being with fewer sleep problems (Steptoe, O'Donnell, Marmot, & Wardle, 2008) and better sleep quality (Hanson & Ruthig, 2012). Individuals who experience better sleep tend to perceive their overall well-being more positively compared to those with poor sleep quality (Hamilton, Nelson, Stevens, & Kitzman, 2007). The World Health Organization (WHO) defines mental health or mental well-being as a state in which individuals recognize their own capabilities, effectively manage everyday life stressors, maintain productivity, contribute to their communities, and experience a sense of fulfillment (WHO, 2004).

Poor sleep quality can have detrimental effects on mental well-being, impacting various aspects of cognitive and emotional functioning, as well as sensory perception (Goel, Rao, Durmer, & Dinges, 2009; Walker, 2008). From childhood to adulthood, individuals experiencing poor sleep quality are at a higher risk for developing depression, anxiety, aggression, and engaging in delinquent behaviors (Stein et al., 2008; Glozier et al., 2010).

The association between sleep quality and depression and anxiety has been consistently demonstrated in various studies (Lovato & Gradisar, 2014; Keles, McCrae, & Grealish, 2020). A systematic review of Alvaro and colleague's (2013) highlighted the relationship between poor sleep quality, disrupted sleep continuity, and increased risk of depression. Specifically, self-reported poor sleep quality has been found to be associated with nearly twice the risk of developing depression (Bao et al., 2017).

Various factors contribute to poor sleep quality, including physical and neuropsychological causes such as sleep apnea or insomnia (Bishir et al., 2020; Chokroverty, 2010). However, this study focuses on targeting an external factor that influences sleep quality, namely social media use. Factors caused by social media that negatively impact sleep quality and mental well-being, such as stress, screen exposure, and sleep interruptions (Woods & Scott, 2016) will be further explained below.

### **The effects of social media use on sleep and mental well-being**

Social media use has been linked to poor sleep quality through several elements that negatively influence sleep (Woods & Scott, 2016). For example, there is a substantial body of evidence linking screen exposure to poor sleep quality, as it leads to shorter sleep duration and later bedtimes (Pea et al., 2012; Shochat et al., 2010, Van den Bulck, 2003). In a cross-sectional study, young adolescents were asked about their sleep duration related to their social media use. Of 268 participants, 37% reported that they went to bed later because they were using social media late into the night (Espinoza & Juvonen, 2011). Although the amount of sleep hours seemed to be related to the amount of social media use, no causal relationship has been established yet.

Another element from social media that may negatively influence sleep quality is sleep disturbance from incoming alerts (Van den Bulck, 2003). Research showed that 86% of adolescents take their phones with them in the bedroom (Lenhart, Ling, Campbell, & Purcell, 2010). In a study of 2546 adolescents, 25% of them reported sleep interruptions from incoming text messages (Van den Bulck, 2003). Social media alerts may also generate feelings of missing out on important information and create pressure to be available (Thomé, Dellve, Härenstam, & Hagberg, 2010). Although it seems desirable to limit social media to improve sleep quality, research shows that restriction of texting and not being able to reply did evoke anxiety and stress in young adults, which may complicate the process of falling

asleep and shorten sleep duration when undergoing a detox (Skierkowski & Wood, 2012; Thomée et al., 2010).

In addition to poor sleep quality, social media use has been associated with several negative outcomes for mental well-being, such as poor self-esteem, poor life satisfaction, loneliness, and anxiety (Bányai et al., 2017; Hawi & Samaha, 2017; Keles, McCrae, & Grealish, 2020). Social media platforms run on user-generated content on which personal feedback is given by followers. Self-confidence may decrease or improve because of that feedback (Valkenburg, Peter, & Schouten, 2006). In addition, social media platforms may generate negative feelings towards oneself, because of continuous upward comparison with other people (Vogel, Rose, Roberts, & Eckles, 2014).

Given the above-mentioned consequences of social media use and the clear associations of social media use with poor sleep quality and mental well-being, it is important to investigate interventions that aim to reduce excessive social media use to prevent negative outcomes from occurring.

### **Social media detox**

Since social media is associated with poor sleep quality and mental well-being, finding interventions to reduce social media use is of great importance. One intervention that has been shown to be effective in reducing social media use is social media detox (Radtke et al., 2022). Social media detox is the conscious interruption or restriction of the use of social media platforms exclusively (El-Khoury et al., 2021). A social media detox aims to break the habit of daily usage and to raise awareness of excessive social media use (Radtke et al., 2022).

Social media detox has some convincing benefits for mental well-being (Brown & Kuss, 2020; Booker, Kelly & Sacker, 2018; Tromholt, 2016). For example, one study found that a digital detox may help to reduce psychological stress (Anrijs et al., 2018). However, contradictory results were found in other studies (Vally & D'Souza, 2019; Wilcockson et al., 2019) and hardly any follow-up measurements were done in the existing studies (Radtke et al., 2022). In addition, little research has examined the effects of social media detox on sleep quality: In a systematic review of Radtke and college's (2022), only one experimental study found a positive effect of social media detox on sleep quality (Liao, 2019) during the detox week. Therefore, it remains unclear whether the effects of a one-week social media detox on sleep quality and mental well-being persist beyond the actual period of the detox. To address

this question, the present study examines the enduring effects of a one-week social media detox on sleep quality and mental well-being. The study measures two components of sleep quality (sleep duration and subjective sleep quality), along with mental well-being both *during* and *following* the detox week. These measures are included as dependent variables, while the independent variable is the condition or group (detox or waitlist) to which participants were assigned.

### **The moderating effects of baseline social media**

During a social media detox, social media use is completely restricted for a week. After the detox, people have the freedom to determine their own social media use. Whether or not participants return to their previous usage level may depend on their baseline level of social media use. Large users may rely more on habitual social media usage (Kross et al., 2013) and are therefore more prone to revert to their previous levels of use after the detox. On the other hand, small users may be more adaptable to changing their behavior because they rely less on habitual usage. Consequently, it is expected that participants' baseline social media use will determine the extent of their social media usage in the follow-up weeks after the detox.

Given the negative effects of social media use on sleep quality and mental well-being, it is expected that large users may experience more adverse effects. Research has shown that higher intensity of Facebook use predicts lower life satisfaction and emotional well-being (Kross et al., 2013). Another study confirmed that intensive social media use was associated with increased symptoms of depression (Lin et al., 2016). Consequently, large users may experience greater benefits from a social media detox in terms of sleep quality and mental well-being. Therefore, the present study included baseline social media use as a moderating variable on the effects of the detox on sleep quality and mental well-being. In Figure 1, the relationships between the moderating variable and the independent and dependent variable are presented.

### **Research question and hypothesis**

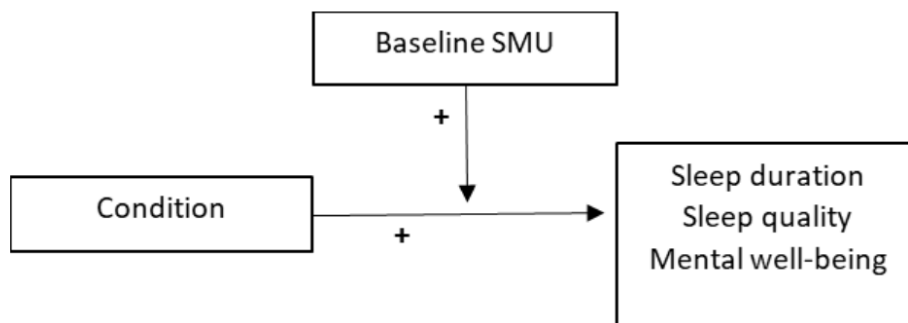
The aim of this study is to investigate whether a one-week social media detox will help to improve sleep quality and mental well-being in the weeks after the completion of the detox. Therefore, the research question is 'To what extent can a one-week social media detox improve sleep quality and mental well-being in the follow-up weeks after the detox?'

The following hypothesis are formulated:

1. A one-week social media detox has a positive effect on sleep duration and sleep quality throughout the follow-up weeks after the detox.
2. A one-week social media detox has a positive effect on mental well-being throughout the follow-up weeks after the detox.
3. The positive effect of a social media detox on sleep quality in the first follow-up week is moderated by baseline social media use, such that the effect is stronger when baseline social media use is higher.
4. The positive effect of a social media detox on mental well-being in the first follow-up week is moderated by baseline social media use, such that the effect is stronger when baseline social media use is higher.

**Figure 1**

*Illustration of moderating effect of Baseline SMU on the relationship between Condition and Sleep duration, sleep quality and mental well-being.*





## Methods

### Design

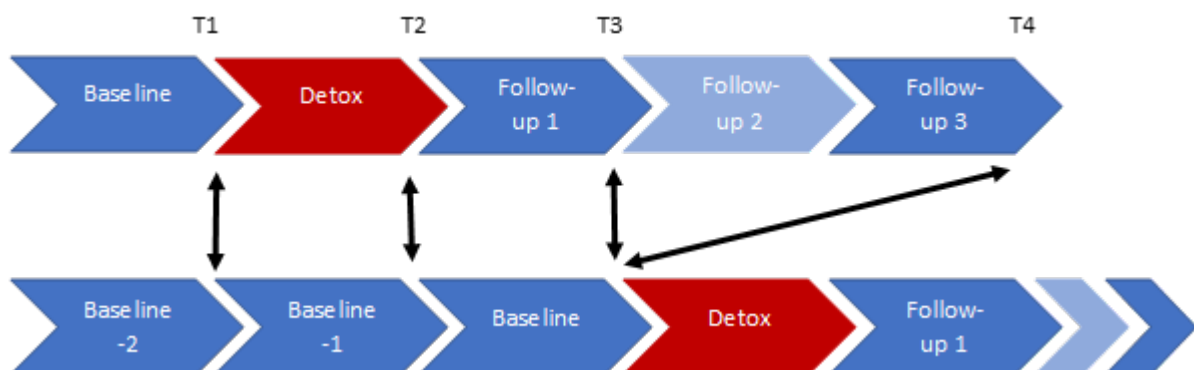
To investigate whether a one-week social media detox will help to improve sleep quality and mental well-being in the weeks after the completion of the detox, a longitudinal mixed-effects design was used in which two conditions existed: subjects were randomly assigned to either an experimental (detox) group or a waitlist group. During the study period of respectively five and seven weeks, participants completed questionnaires at five measurement points about their social media use, mental well-being and sleep quality.

The experimental group underwent a baseline week, detox week and three follow-up weeks. The waitlist group underwent three baseline weeks, after which they underwent the detox as well (Figure 2). After each week, social media usage, sleep quality, sleep duration and mental well-being were measured. The effects during the detox week itself, as well as the follow-up effects of the detox were measured and compared to the baseline data of the waitlist group. The data from the last baseline week of the waiting list group was used twice, so that a comparison could be made with the experimental group at follow-up week 3 (Figure 2).

During the detox week, participants were asked to remove all social media applications from their smartphones, which included: Facebook, Snapchat, Instagram, Reddit, Youtube, Pinterest, Twitter, Tumblr, BuzzFeed, and TikTok. In addition, participants were asked to not use their social media on any other device or browser such as laptops, tables, PCs or webpages). After the detox, participants were allowed to redownload their social media apps and use them as they like for three weeks.

**Figure 2**

*Study design and comparisons between experimental (upper) and waitlist (bottom) group*



\* *Note.* In each week, the experimental group was compared to the baseline weeks of the waiting list group.

## **Procedure**

Each measurement point took place on Monday at noon. Participants received an email with a link directing them to Qualtrics (Qualtrics, 2021) to fill out the weekly questionnaires. If no response was received, a reminder email was sent 8 hours later and if no response was received on that reminder, a follow-up phone call was made the next day. If participants still did not respond by fulfilling the survey, their participation was terminated.

In addition to fulfilling the surveys that were used for this study, participants also filled out daily ecological momentary assessments thrice daily using the smartphone app Ethica (Ethica Data, Saskatoon, SK) about craving and automaticity of social media usage. The data from those assessments are not reported in this study.

To enhance the effects of the detox, participants applied some behavior change strategies at the start of the detox week. Participants signed contracts with themselves to assure their commitment and accountability to the social media abstinence during the detox week. In addition, participants reflected on their social media use. They evaluated their motivations, challenges as well as strategies to overcome these challenges. They also set personal goals and watched a motivational video to maximize their personal motivation to complete the detox. Finally, participants were recommended to inform their friends and family about the detox and to post about their abstinence on their social media.

## **Participants**

Participants were recruited by the research team at the University of Amsterdam from which the secondary data originated. Participants were approached through UvA networks and via social media advertisements on Facebook and Instagram. They could register for the survey via the website [socialmediastop.nl](http://socialmediastop.nl).

Out of the 233 initial sign-ups for the study, 76 participants were excluded based on the inclusion criteria which were: approving with statement of approval, age of 16-40 years, residing in EU, spending at least 1 hour per day on social media and motivated to reduce social media use by undergoing a one-week detox. After checking for inclusion criteria, 137 participants were left and completed the first 3 weeks of the study. Within this period, 27 participants were removed due to technical issues, voluntary exit, or missed assessments.

Subsequently, 8 participants dropped out, and 7 participants were excluded due to missing data or incorrect responses to both attention check questions.

Participants who completed the entire study received a monetary compensation of 25 euros. The final 122 participants who completed the study were assigned to either the experimental group (55 participants) or the waitlist group (67 participants). Based on the final number of included participants, a sensitivity analysis was conducted using the software G\*Power (Version 3.1.9.7) to determine the minimum effect size ( $d = 0.106$ ) necessary to achieve a power of .80 at an alpha of 0.05.

## **Measures**

### *Sociodemographic characteristics*

To ensure that participants met the inclusion criteria, they were asked about their age, gender, place of residence, highest achieved level of education, daily social media use and their motivation to reduce their use.

### *Social media usage*

In this study, social media use refers to the objective social media use of participants, which was obtained through the apps Digital Wellbeing for Android or Screen Time for iOS. These apps track smartphone use and provide insights into the number of openings, notifications, screen time and app use. At each measurement, participants filled in their daily number of unlocks, screen time and time spent on the top 3 social media apps from the last week. In this study, only the weekly average of the time spent on the top 3 social media apps will be used to measure social media usage.

### *Sleep quality*

The two components of sleep quality were measured in separate questionnaires: sleep duration was measured by the PSIQ, and subjective sleep quality by the SQS.

### *SQS*

Subjective sleep quality was measured through a single-item Sleep Quality Scale (Snyder, Cai, DeMuro, Morrison, & Ball (2018)). The SQS is a self-assessment measurement for assessing sleep quality. Participants rated their sleep quality over the past 7 days on a 10-point scale, where 0 is Terrible and 10 is Excellent. They were asked to assess their sleep

quality based on the number of hours they slept, how easily they fell asleep, how often they had woken up during the night, and how refreshing their sleep was for most of the nights. A good construct validity for the single-item version of the Sleep Quality Scale was evidenced in an extensive psychometric evaluation study (Snyder, Cai, DeMuro, Morrison, & Ball, 2018).

### *PSIQ*

The Pittsburgh Sleep Quality Index (PSQI) was used to assess sleep duration (Buysse et al., 1989). Originally, the PSQI is a self-rated questionnaire with 19 items, measuring seven components of sleep quality. However, for this study, a shortened version of the PSQI was used, focusing only on the first four questions related to sleep duration. These questions concern bedtime, sleep latency, wake-up time, and actual sleep time per night. Additionally, participants were asked about their sleep habits over the past week, instead of the original assessment period of one month.

### *Mental wellbeing*

For assessing mental well-being, participants filled out The Warwick-Edinburgh Mental Wellbeing Scales (Tennant et al., 2007). In this study, the 14-item scale of the WEMWBS was used, which consists of statements about aspects of feeling and functioning of mental wellbeing. Participants rated the statements on a 5-point scale ranging from ‘None of the time’ to ‘All of the time’. The total score of the WEMWBS is calculated by the sum of each individual score per statement, whereby a higher score indicates a higher level of well-being. In the current study, the WEMWBS was reliable at each measurement point ( $\alpha = .840$ ,  $\alpha = .897$ ,  $\alpha = .918$ ,  $\alpha = .936$ ,  $\alpha = .936$ ).

### **Data-preprocessing**

The raw data from the secondary dataset was pre-processed in SPSS 28. Participants who did not meet the inclusion criteria were excluded, and data from participants who dropped out or had missing data were removed. Daily reported social media use was transformed into weekly averages. Participant’s demographic data was checked for randomization. For the waiting list group, only two baseline measurements of the SQS, PSQI and WEMWBS were available. To enable a comparison with the experimental group at each

time point, an average score was computed from the two baseline weeks (T3), and the last baseline measurement was used twice (Figure 1).

### **Data analysis**

To examine the effect of group on sleep duration, sleep quality and mental well-being over time, three separate repeated measures ANOVA's were conducted, in which time was included on the within-subjects level, measuring the dependent variables at four time points (pre-detox, end of detox, 1-week follow-up, 3-week follow-up). Group was included at the between-subjects level, distinguishing two groups (detox vs. waitlist). Assumptions of ANOVA were met, except the assumption of sphericity, which was violated and corrected using the Greenhouse-Geisser correction.

To explore the moderating role of baseline social media use on all three outcome variables, three separate multiple regression analyses were performed at the 1-week follow-up point. These regressions included condition (experimental vs. waitlist) as the independent variable, sleep duration, sleep quality and mental well-being at 1-week Follow-up as the dependent variable and baseline social media use (SMU) as moderator.

A sensitivity analysis was performed on 14 participants that incorrectly answered one of the attention check questions. These participants were temporarily excluded, and the analyses repeated to detect any differences in results.

## Results

### Sample characteristics

The final 122 participants who completed the study were admitted to either the experimental group (n = 55) or the waitlist group (n = 67). A randomization check was done to check the basic equivalence of gender and age across both groups. To check for differences in age and gender, a one-way ANOVA was performed. No significant differences in age or gender were found between the groups. Demographic information for each group is presented in Table 1.

**Table 1**

*Analysis of gender and age of the experimental group (EG) and waitlist group (WG)*

	EG Mean (SD)	WG Mean (SD)	p-value	df	F	Effect size
Age, years	23.91 (4.14)	22.97 (3.83)	.197	1	1.687	.014
Gender F/M/O	47/7/1 (.420)	61/5/1 (.353)	.400	1	.713	.006

\**Note.* SD: Standard Deviation. F: Female. M: Male. O: Other.

### Sleep duration and sleep quality outcomes

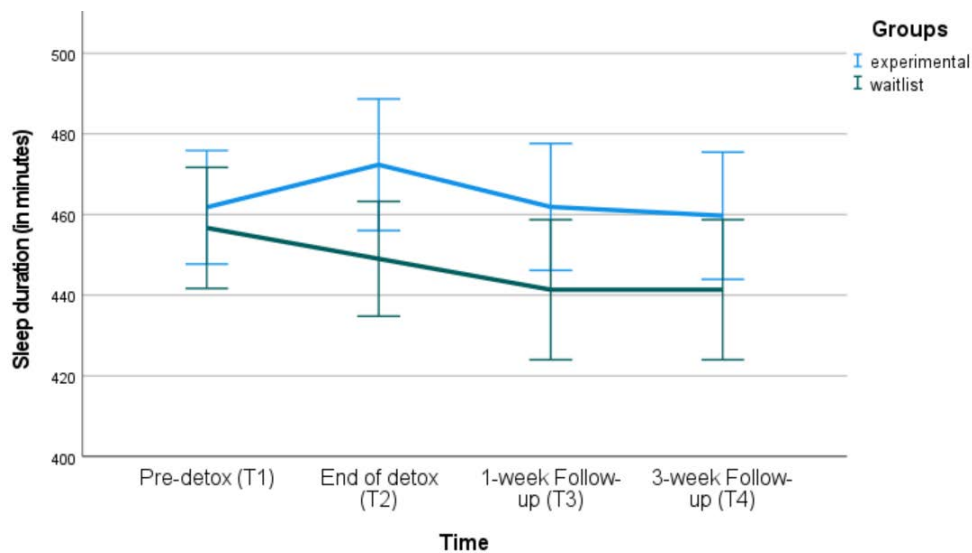
To test the first hypothesis, which stated that a one-week social media detox would have a positive effect on sleep duration and quality in the follow-up weeks after the detox, two repeated measures ANOVA's were performed. In both analyses, the within-subjects factor 'time' represented the four different timepoints at which sleep duration and sleep quality were measured (e.g., pre-detox (T1), end of detox (T2), 1-week follow-up (T3) and 3-week follow-up (T4)). The between-subjects factor 'group' distinguished between the two conditions to which participants were assigned: the detox and the waitlist group.

Taking first the relationship between the detox and sleep duration (PSIQ), no main effects of time ( $F(1, 242) = 2.919, p = .057, \eta^2 = .024$ ) or group ( $F(1,242) = 2.825, p = .095, \eta^2 = .023$ ) were found. Furthermore, no interaction effect between group and time was found ( $F(1, 242) = 1.770, p = .173, \eta^2 = .015$ ), indicating that the experimental group did not report significantly more sleep than the waitlist group over time (Figure 3). These results were

contrary to the expectation that the detox would have a positive effect on sleep duration throughout the follow-up weeks.

**Figure 3**

*Development of daily means of sleep duration (PSIQ) in minutes*

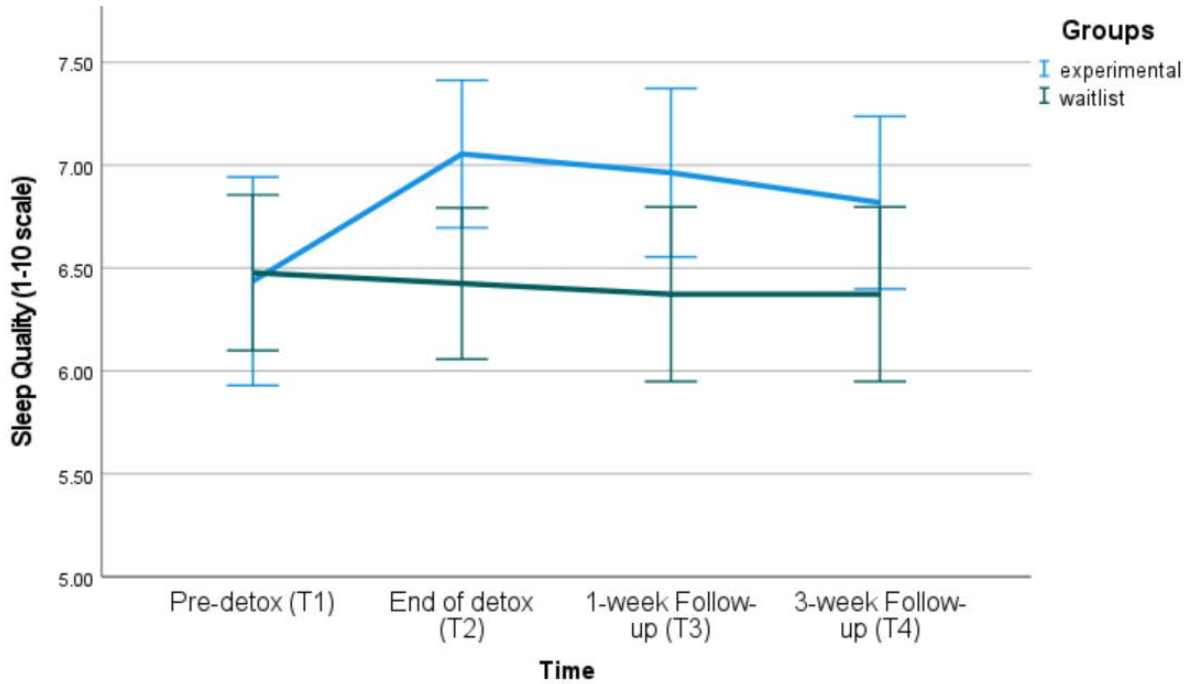


Regarding sleep quality (SQS), no main effect of time ( $F(1, 242) = 2.489, p = .089, \eta^2 = .020$ ) or group ( $F(1, 242) = 2.409, p = .123, \eta^2 = .020$ ) was found. Nonetheless, a significant interaction effect between time and group was found ( $F(1, 242) = 4.054, p = .021, \eta^2 = .033$ ), indicating that the means of the groups on sleep quality differed significantly over time (Figure 4). This was in accordance with the expectation that the detox would have a positive effect on sleep quality.

To investigate at which time point sleep quality (SQS) differed significantly between groups, a test for simple main effects was executed, comparing the effect of group at each separate time point. This revealed a significant simple main effect of group at the end of the detox week (T2) and in the first follow-up week (Table 2), indicating a positive effect of the detox on sleep quality *during* the detox and throughout the first follow-up week. However, no significant differences in means between the groups were found in the third follow-up week. Thus, the effect of the detox did not last throughout the third follow-up week.

**Figure 4**

*Development of sleep quality (SQS) rated on a 1-10 points scale*



**Table 2**

*Simple main effects of group at each timepoint for SQS*

Time	Mean difference (Detox-Waitlist)	<i>p</i> -value
Pre-detox (T1)	-.041	.894
End of detox (T2)	.629*	.017
1-week Follow-up (T3)	.591*	.050
3-week Follow-up (T4)	.445	.143

*Note.* \* The mean difference is significant at  $p < .05$

### **Mental well-being outcomes**

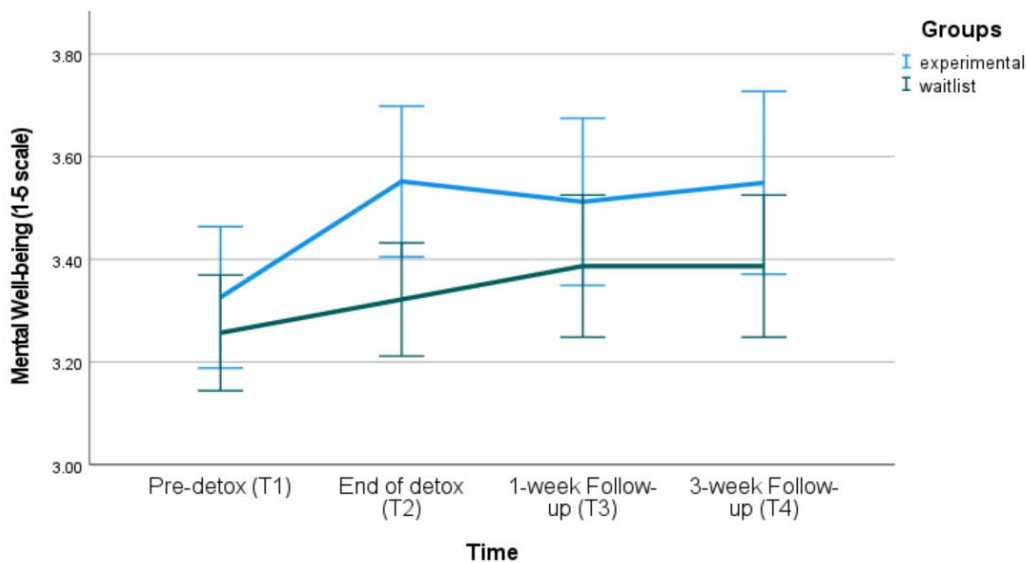
The second hypothesis stated that a one-week social media detox would have a positive effect on mental well-being in the follow-up weeks after the detox. To test this, a repeated measures ANOVA was performed, in which 'time' was again used to measure within-subject effects and 'group' to measure between-subjects effects.



A significant main effect of 'time' on mental well-being ( $F(1, 242) = 11.248, p < .001, \eta^2 = .086$ ) indicated that the means of mental well-being differed significantly over time. Mental well-being was thus rated significantly different in general on different time points (Figure 5). No significant main effect of 'group' was found ( $F(1, 242) = 2.649, p < .106, \eta^2 = .022$ ). To address the answer to the hypothesis, no interaction effect between group and time was found ( $F(1, 242) = 1.947, p = .143, \eta^2 = .016$ ) for mental well-being, which suggests that mental well-being was not rated differently between groups over time. This result was against the expectation that the detox would have a positive effect on mental well-being throughout the follow-up weeks.

### Figure 5

*Development of average mental well-being rated on a 1-5 scale and calculated from a 12-item questionnaire (WEMWBS).*



### Moderation analysis

Testing the third hypothesis, which stated that baseline social media use would reinforce the effects of the detox on sleep quality and sleep duration at 1-week follow-up, two separate multiple regression analyses were performed at the 1-week Follow-up timepoint (T3).

For sleep duration, the interaction effect between Condition and Baseline SMU was not significant at the 1-week Follow-up (T3) ( $\beta = -.064, p = .851$ ), suggesting that the

relationship between the groups and sleep duration was not moderated by the level of baseline social media use at that time point.

The same analysis for sleep quality also revealed insignificant interaction effects between Condition and Baseline SMU at the 1-week Follow-up ( $\beta = .111$ ,  $p = .745$ ).

These findings suggest that baseline social media use does not moderate the positive effect of the detox on sleep quality at the 1-week Follow-up point. In other words, the effect of the detox on sleep duration and sleep quality in the first follow-up week is not stronger if baseline social media use is higher. Therefore, the results do not confirm the third hypothesis.

Finally, the last hypothesis was tested, which stated that there would be a moderating effect of baseline social media use on the positive effect of the detox on mental well-being, such that the effect would be stronger when baseline social media use was higher. A multiple regression analysis was performed to test the moderating effect, however no significant interaction effect was found between Condition and baseline SMU at the 1-week follow-up ( $\beta = .169$ ,  $p = .622$ ), indicating that baseline social media use did not moderate the effect of the detox on mental well-being in the first follow-up week. The fourth hypothesis was thus not confirmed.

### **Sensitivity analyses**

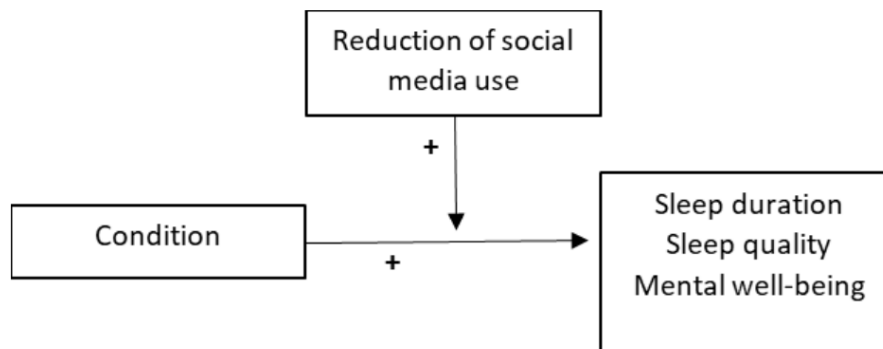
A sensitivity analysis was performed in which 14 participants were temporarily excluded that incorrectly answered one of the attention check questions. All analyses were run again, to check for any differences in results. The exclusion of these 14 participants did not result in any significant changes in results, therefore the participants remained included in the main analyses.

### **Exploratory analysis**

The insignificant effects of the detox throughout the follow-up weeks raised the question whether the effect of the detox was influenced by the extent to which participants reduced their social media use after the detox. A new hypothesis was formed, in which it was expected that the effects of the detox in the first follow-up week would be stronger when social media reduction was high. To test this, mean differences were calculated between pre-detox social media use and social media use in the first follow-up week. Three separate multiple regressions were performed to test the moderating effects of social media reduction on the relationship between the detox and the dependent variables (Figure 6).

### **Figure 6**

*Moderating effects of reduction of social media use on the relationship between condition and outcome variables at 1-week follow-up*



In the first follow-up week, no significant moderating effects of reduction of social media use were found for sleep duration ( $\beta = -.581, p = .067$ ), sleep quality ( $\beta = -.201, p = .528$ ) and mental well-being ( $\beta = .077, p = .811$ ). Surprisingly, the effects of the detox on sleep duration, sleep quality and mental well-being were not influenced by reduction of social media use. The new hypothesis was thus not confirmed.

Secondly, the data showed that 13 participants (23.6%) from the experimental group had not fully complied with the detox. On average, they used about 49 minutes of social media during the detox week, mostly by using other devices than their mobile phones. This raised the question whether different effects in the first follow-up week would result for subgroups of participants (full adherence vs. partly adhering). Adherence to the detox was included as a moderator and multiple regression analysis were performed to check for any significant differences in effects in the first follow-up week. It was expected that partial adherence would result in a weakened effect of the detox. However, no significant differences were found in sleep quality ( $\beta = .211, p = .635$ ) sleep duration ( $\beta = -.412, p = .354$ ) or mental well-being ( $\beta = .073, p = .872$ ) between subgroups. Thus, whether people partial adherence did not result in any differences in effects of the detox on sleep quality or mental well-being.

## Discussion

### **Sleep quality and mental well-being**

Previous research has primarily concentrated on investigating the effects of social media detox during the detox week. While some studies have provided evidence supporting the positive impact of social media detox on sleep quality and mental well-being, conflicting findings were also found in other research studies (Radtke et al., 2022). The present study confirmed the positive effects of social media detox on sleep quality during the detox week. For sleep duration and mental well-being, no significant improvements were found.

In addition, this study evaluated the follow-up effects of the detox as well. Addressing the first two hypothesis of this study, a lasting positive effect of a one-week social media detox was expected on both sleep quality and mental well-being throughout the follow-up weeks after the detox. A significant effect on sleep quality was found in the first follow-up week, although this effect did not last throughout the third follow-up week. For mental well-being, no significant effects of the detox were found in the follow-up week, which may be due to the higher mean on mental well-being of the experimental group at baseline. Thus, the one-week social media detox did improve sleep quality on a short-term basis, however it does not result in any long-term improvements for sleep quality and mental well-being.

These findings raised the question of whether social media reduction following the detox might be a moderating factor to the follow-up effects of social media detox. Linking back to the negative effects on sleep quality and mental well-being that social media use entail (Keles, McCrae, & Grealish, 2020; Van den Bulck, 2003), the reduction of social media usage in the follow-up weeks would be a logical factor contributing to participant's sleep quality and mental well-being in the follow-up weeks. Interestingly, the exploratory analysis showed that the amount of reduction of social media use did not moderate the effects of the detox on sleep duration, sleep quality and mental well-being. These findings question the exact relationship between social media use and sleep quality and mental well-being.

Lastly, adherence to the detox was included to check for differences between fully adhering participants and partly adhering participants. Partial findings suggest that sustained abstinence from social media and complete adherence to the detox are not necessary to fully reap the benefits of the detox.

### **The moderating effect of baseline social media use**

This study included the level of baseline social media use as a moderator of the effect of the detox. It was expected that the effect of the detox in the first follow-up week would be

stronger when baseline social media use was higher, such that intensive social media users would report better sleep quality and mental well-being after the detox than less intensive users. No moderating effects of baseline social media use was found for any outcome variable, suggesting that baseline social media use did not influence the effects of the detox.

These findings were not in line with the expectations and with the existing literature on intensive social media use. Previous studies showed that intensive social media use was related to more sleep problems and mental health issues (Kross et al., 2013). Higher social media use was associated with shorter sleep duration, longer sleep onset latency, and increased sleep disturbance among adolescents (Levenson et al., 2021; Lin et al, 2016). Another study by Woods and Scott (2016) indicated that excessive use of social media platforms was linked to higher levels of social comparison, which in turn was associated with increased depressive symptoms.

Regarding the negative correlations between excessive social media use and sleep and mental well-being, it was expected that large social media users would experience greater benefits from a social media detox in terms of sleep quality and mental well-being. A possible explanation for the difference in findings could be the design in which the current study was conducted. In contrast to the cross-sectional designs in which the previous studies were conducted, this study was performed in a longitudinal design, which allowed to find any long-term relationships between social media detox and sleep quality and mental well-being. The result is that this long-term relationship does not exist for sleep duration and mental well-being, and therefore does not differ for intensive or less intensive users.

Another explanation may lie in the fact that large users may experience more negative consequences of a detox than expected. In previous research, adverse effects of a detox such as feelings of missing out and pressure to be available (Thomée, Dellve, Härenstam, & Hagberg, 2010) were pointed out. The restriction of texting and not being able to reply, evoked anxiety and stress in young adults, which may have complicated the process of falling asleep and shorten sleep duration (Skierkowski & Wood, 2012; Thomée et al., 2010). The results for small and large users could thus be equalized by the additional disadvantages experienced by large users.

## **Strengths**

In comparison to cross-sectional designs commonly used in previous studies, which focus solely on the effects during the detox week itself, this study was performed in a longitudinal experimental design. This design allowed to find causal relationships between social media detox and sleep quality and mental well-being. By randomly assigning participants to either the experimental or control group, the internal validity of the findings was guaranteed.

Furthermore, the longitudinal nature of this study provided a significant advantage over cross-sectional designs. By assessing participants' sleep quality and mental well-being at multiple time points before and after the social media detox, this study captured changes over time.

Another strength of this research is the real-life setting in which the research was conducted. Participants underwent the social media detox in the context of their daily lives, reflecting a naturalistic environment. Unlike controlled laboratory settings, this study examined the effects of the detox in the context of participants' real-world experiences, allowing for a more realistic representation of how a detox would work in people's everyday lives. For example, the varying levels of adherence to the detox is a realistic reflection of what a detox would be in a real-life scenario. This provides valuable insights into the effectiveness and of the detox, because it accounts for the practical limitations that participants encounter when trying to reduce their social media usage in real-life situations.

### **Limitations and further research**

There are some limitations of the current study that should be taken into consideration. In considering the generalizability of the findings, it is important to acknowledge the characteristics of the sample utilized in this study. The sample consisted mostly of females under the age of 25, which limits generalizability to the broader population. However, this sample composition also provides valuable insights into specific subgroups that may be particularly susceptible to the effects of social media use. Research has consistently indicated that women are more likely to experience negative effects related to social media use, including impacts on sleep quality and mental well-being (Levenson, 2016; Woods & Scott, 2016). Therefore, by focusing on a sample primarily composed of females, this study examined an important subgroup that may benefit from interventions such as social media detox. Future research that includes a more diverse sample is needed to be

able to generalize these findings and to provide a better understanding of the impact of social media detox across various demographic groups.

Although social media detox appears to be effective in improving sleep quality and mental well-being during the week itself (Radtke et al., 2022), this study found no significant long-term effects of the detox. Interestingly, the reduction in social media use after the detox did not lead to significant changes in the follow-up effect of the detox on sleep quality or mental well-being. In addition, adherence to the detox also did not result in any changes of effects. This raises the question of what the precise effect of social media use is on sleep quality and mental well-being, and what other possible factors are contributing to the effect of social media detox. In future research, it may be interesting to investigate this further.

### **Conclusion**

This study aimed to investigate whether a one-week social media detox would improve sleep quality and mental well-being throughout the follow-up weeks after the detox. The found results confirmed a positive effect of the detox on sleep quality *during* the detox week and throughout the first follow-up week. However, no significant results were found for sleep duration and mental well-being. These results did not change for different levels of baseline social media use, reduction of social media in the follow-up week or partial adherence to the detox. These findings suggest that complete adherence to the detox and sustained abstinence from social media are not necessary to fully reap the benefits of the detox. Further research may further investigate the interaction between social media use and sleep quality and mental well-being, and possible contributing factors that could explain the results from the current study.

## References

- Alvaro, P. K., Roberts, R. M., & Harris, J. K. (2013). A systematic review assessing bidirectionality between sleep disturbances, anxiety, and depression. *Sleep, 36*(7), 1059-1068.
- Anrijs, S., Bombeke, K., Durnez, W., Van Damme, K., Vanhaelewyn, B., Conradie, P., ... & De Marez, L. (2018). MobileDNA: Relating physiological stress measurements to smartphone usage to assess the effect of a digital detox. *HCI International 2018 - Posters' Extended Abstracts, PT II*, 851.
- Bányai, F., Zsila, Á., Király, O., Maraz, A., Elekes, Z., Griffiths, M. D., ... & Demetrovics, Z. (2017). Problematic social media use: Results from a large-scale nationally representative adolescent sample. *PloS one, 12*(1), e0169839.
- Bao, Y. P., Han, Y., Ma, J., Wang, R. J., Shi, L., Wang, T. Y., ... & Lu, L. (2017). Cooccurrence and bidirectional prediction of sleep disturbances and depression in older adults: meta-analysis and systematic review. *Neuroscience & Biobehavioral Reviews, 75*, 257-273.
- Best, P., Manktelow, R., & Taylor, B. (2014). Online communication, social media and adolescent wellbeing: A systematic narrative review. *Children and Youth Services Review, 41*, 27-36.
- Bishir, M., Bhat, A., Essa, M. M., Ekpo, O., Ihunwo, A. O., Veeraraghavan, V. P., ... & Ojcius, D. M. (2020). Sleep deprivation and neurological disorders. *BioMed research international, 2020*.
- Booker, C. L., Kelly, Y. J., & Sacker, A. (2018). Gender differences in the associations between age trends of social media interaction and well-being among 10–15-year-old in the UK. *BMC public health, 18*(1), 1-12.
- Brown, L., & Kuss, D. J. (2020). Fear of missing out, mental wellbeing, and social connectedness: a seven-day social media abstinence trial. *International Journal of Environmental Research and Public Health, 17*(12), 4566.
- Bruni, O., Sette, S., Fontanesi, L., Baiocco, R., Laghi, F., & Baumgartner, E. (2015). Technology use and sleep quality in preadolescence and adolescence. *Journal of clinical sleep medicine, 11*(12), 1433-1441.



- Buyse, D. J., Reynolds III, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry research*, 28(2), 193-213.
- Central Bureau for Statistics (2019). *Internet; toegang, gebruik en faciliteiten; 2012-2019*. Retrieved from <https://opendata.cbs.nl/statline/#/CBS/nl/dataset/83429NED/table?dl=13A7B>
- Chokroverty, S. (2010). Overview of sleep & sleep disorders. *Indian Journal of Medical Research*, 131(2), 126-140.
- El-Khoury, J., Haidar, R., Kanj, R. R., Ali, L. B., & Majari, G. (2021). Characteristics of social media 'detoxification' in university students. *Libyan Journal of Medicine*, 16(1).
- Espinoza, G., & Juvonen, J. (2011). The pervasiveness, connectedness, and intrusiveness of social network site use among young adolescents. *Cyberpsychology, Behavior, and Social Networking*, 14(12), 705-709.
- Glozier, N., Martiniuk, A., Patton, G., Ivers, R., Li, Q., Hickie, I., ... & Stevenson, M. (2010). Short sleep duration in prevalent and persistent psychological distress in young adults: the DRIVE study. *Sleep*, 33(9), 1139-1145.
- Goel, N., Rao, H., Durmer, J. S., & Dinges, D. F. (2009). Neurocognitive consequences of sleep deprivation. *Seminars in neurology*, 29(4), 320-339.
- Hamilton, N. A., Nelson, C. A., Stevens, N., & Kitzman, H. (2007). Sleep and psychological well-being. *Social Indicators Research*, 82, 147-163.
- Hanson, B. L., & Ruthig, J. C. (2012). The unique role of sleep quality in older adults' psychological well-being. *Journal of Applied Gerontology*, 31(5), 587-607.
- Hawi, N. S., & Samaha, M. (2017). The relations among social media addiction, self-esteem, and life satisfaction in university students. *Social Science Computer Review*, 35(5), 576-586.
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling.

- Hinsch, C., & Sheldon, K. M. (2013). The impact of frequent social internet consumption: Increased procrastination and lower life satisfaction. *Journal of Consumer Behaviour*, 12, 496–505.
- Kahn-Greene, E. T., Killgore, D. B., Kamimori, G. H., Balkin, T. J., & Killgore, W. D. (2007). The effects of sleep deprivation on symptoms of psychopathology in healthy adults. *Sleep medicine*, 8(3), 215-221.
- Keles, B., McCrae, N., & Grealish, A. (2020). A systematic review: the influence of social media on depression, anxiety and psychological distress in adolescents. *International Journal of Adolescence and Youth*, 25(1), 79-93.
- Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., ... & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PloS one*, 8(8), e69841.
- Lenhart, A., Ling, R., Campbell, S., & Purcell, K. (2010). Teens and mobile phones: Text messaging explodes as teens embrace it as the centerpiece of their communication strategies with friends. *Pew internet & American life project*.
- Leone, S., Van der Poel, A., Beers, K., Rigter, L., Zantinge, E., & Savelkoul, M. (2018). Slechte slaap: een probleem voor de volksgezondheid. *Utrecht: Trimbos Instituut, Netherlands Institute of Mental Health and Addiction*.
- Liao, W. (2019). Put your smartphone down: *Preliminary evidence that reducing smartphone use improves psychological well-being in people with poor mental health* [Unpublished master thesis]. University of Otago.
- Lin, L. Y., Sidani, J. E., Shensa, A., Radovic, A., Miller, E., Colditz, J. B., ... & Primack, B. A. (2016). Association between social media use and depression among US young adults. *Depression and anxiety*, 33(4), 323-331.
- Lovato, N., & Gradisar, M. (2014). A meta-analysis and model of the relationship between sleep and depression in adolescents: recommendations for future research and clinical practice. *Sleep medicine reviews*, 18(6), 521-529.
- Newcom Research & Consultancy B.V. (2023). *Nationale Social Media Onderzoek 2023*. Retrieved from <https://www.newcom.nl/product/nationale-social-media-onderzoek-basis-2023/>

- Ohayon, M., Wickwire, E. M., Hirshkowitz, M., Albert, S. M., Avidan, A., Daly, F. J., ... & Vitiello, M. V. (2017). National Sleep Foundation's sleep quality recommendations: first report. *Sleep health*, 3(1), 6-19.
- Pea, R., Nass, C., Meheula, L., Rance, M., Kumar, A., Bamford, H., ... & Zhou, M. (2012). Media use, face-to-face communication, media multitasking, and social well-being among 8-to 12-year-old girls. *Developmental psychology*, 48(2), 327.
- Radtke, T., Apel, T., Schenkel, K., Keller, J., & von Lindern, E. (2022). Digital detox: An effective solution in the smartphone era? A systematic literature review. *Mobile Media & Communication*, 10(2), 190-215.
- Shochat, T., Flint-Bretler, O., & Tzischinsky, O. (2010). Sleep patterns, electronic media exposure and daytime sleep-related behaviours among Israeli adolescents. *Acta Paediatrica*, 99(9), 1396-1400.
- Skierkowski, D., & Wood, R. M. (2012). To text or not to text? The importance of text messaging among college-aged youth. *Computers in Human Behavior*, 28(2), 744-756.
- Snyder, E., Cai, B., DeMuro, C., Morrison, M. F., & Ball, W. (2018). A new single-item sleep quality scale: results of psychometric evaluation in patients with chronic primary insomnia and depression. *Journal of Clinical Sleep Medicine*, 14(11), 1849-1857.
- Stein, M. B., Belik, S. L., Jacobi, F., & Sareen, J. (2008). Impairment associated with sleep problems in the community: relationship to physical and mental health comorbidity. *Psychosomatic Medicine*, 70(8), 913-919.
- Stephens, A., O'Donnell, K., Marmot, M., & Wardle, J. (2008). Positive affect, psychological well-being, and good sleep. *Journal of psychosomatic research*, 64(4), 409-415.
- Tennant, R., Hillier, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., ... & Stewart-Brown, S. (2007). The Warwick-Edinburgh mental well-being scale (WEMWBS): development and UK validation. *Health and Quality of Life Outcomes*, 5(1), 1-13.
- Thomé, S., Dellve, L., Härenstam, A., & Hagberg, M. (2010). Perceived connections between information and communication technology use and mental symptoms among young adults—a qualitative study. *BMC Public Health*, 10, 1-14.

- Tromholt, M. (2016). The Facebook experiment: Quitting Facebook leads to higher levels of well-being. *Cyberpsychology, behavior, and social networking*, 19(11), 661-666.
- Uhls, Y. T., Ellison, N. B., & Subrahmanyam, K. (2017). Benefits and costs of social media in adolescence. *Pediatrics*, 140, 67-70.
- Vally, Z., & D'Souza, C. D. (2019). Abstinence from social media use, subjective well-being, stress, and loneliness. *Psychiatric Care*, 55(4), 752-759.
- Valkenburg, P. M., Peter, J., & Schouten, A. P. (2006). Friend networking sites and their relationship to adolescents' well-being and social self-esteem. *CyberPsychology & behavior*, 9(5), 584-590.
- Van den Bulck, J. (2003). Text messaging as a cause of sleep interruption in adolescents, evidence from a cross-sectional study. *Journal of Sleep Research*, 12(3), 263.
- Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social comparison, social media, and self-esteem. *Psychology of popular media culture*, 3(4), 206.
- Walker, M. P. (2008). Cognitive consequences of sleep and sleep loss. *Sleep medicine*, 9, 29-34.
- Whiting, A., en D. Williams (2013). Why people use social media: a uses and gratifications approach. *Qualitative Market Research: An International Journal*, 16(4).
- Wilcockson, T. D. W., Osborne, A. M., & Ellis, D. A. (2019). Digital detox: The effect of smartphone abstinence on mood, anxiety, and craving. *Addictive Behaviors*, 99, 106265.
- Woods, H. C., & Scott, H. (2016). # Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal of adolescence*, 51, 41-49.
- World Health Organization. (2004). *Promoting mental health: Concepts, emerging evidence, practice: Summary report*. World Health Organization.

