SOCIAL MEDIA USE AND ITS RELATIONSHIP WITH WELL-BEING

The associations between social media use, need fulfilment, negative side effects, and well-being

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Abstract

Purpose: As there is an ongoing debate about whether social media use increases or decreases users' well-being, the purpose of this study is to find out under which conditions social media use is detrimental and beneficial for its users. Based on the Uses- and Gratification framework, social media use is driven by informational, entertainment, personal identity, and social needs fulfilment. Additionally, literature suggests that social media use has negative side effects, which were sleep disturbances, malicious envy, and social media addiction. Therefore, this study aims at exploring to what extent the fulfilment of users' needs and negative side effects of social media use can explain the different effects of social media use related to well-being.

Method: A correlational survey design was chosen to test if the relationship between social media use and well-being is mediated by the fulfilment of users' needs and the negative side effects of social media use. Therefore, 123 university students (18-28 years) participated in an online survey. Exploratory factor analysis was conducted to justify the constructed variables and data were analysed using multiple mediation analysis.

Results: Results showed no significant direct relationship between the independent variable social media use and the dependent variable well-being. Due to the shortfall of the main effect, there could be no investigations made about possible mediation effects of needs fulfilment and negative side effects of social media use. However, social media use is a significant positive predictor of informational, entertainment and personal identity needs fulfilment and social media addiction. Furthermore, participants who reported higher levels of one of the three side effects of social media use also reported significantly lower levels of well-being.

Conclusion: This study demonstrates that social media use does not univocally lead to improved or worsened well-being but could also have no influence. However, social media addiction was identified as a risk factor of social media use, which also decreases well-being. Furthermore, this study supports the Uses and Gratifications framework by showing that higher social media use fulfils most of participants' needs to a greater extent. Limitations and future research directions are discussed.

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1. Introduction

With the start of digitalisation, social media also developed and today it is hard to imagine everyday life without it. Starting with the development of e-mail in 1971 and the first discussion forums in the early 2000s, the first user-generated platforms evolved with Web 2.0 starting in 2005 (Sajithra & Rajindra, 2013). Social media (SM) are "internet-based channels that allow users to opportunistically interact and selectively self-present, either in real-time or asynchronously, with both broad and narrow audiences who derive value from user-generated content and the perception of interaction with others" (Carr & Hayes, 2015, p. 50). SM includes social networking sites, which entails a collection of virtually created profiles that can be shared or commented on, like Facebook and Instagram, but also instant messengers, which can be integrated into social networking sites, for example, Facebook messenger, or standalone platforms, such as WhatsApp and Telegram (Correa et al., 2010).

Over the last few years, SM has become increasingly prevalent. As shown by statistics, in 2008, only 10% of the U.S population used SM, whereas in 2021, already 82% were using it (Triton Digital, 2021). One year later, around 71% of the Dutch population was using SM daily (Statista, 2022). Especially during the Covid-19 pandemic, in which face-to-face contact was drastically reduced by the recommendation to stay at and work from home, SM was used more than ever. This is underlined by statistics which show that around 30% of the SM users in the United States used SM 1-2 hours and 20% even 2-3 hours in addition to their regular screen time (eMarketer, 2020). As people nowadays are spending more and more time on SM it is important to understand the effects increased SM use may have on people's well-being.

Well-being (WB) is a "positive state experienced by individuals and societies […] determined by social, economic, and environmental conditions" (World Health Organization, 2021, p.10). Therefore, WB cannot simply be understood as the absence of symptoms or the opposite of being ill but encompasses peoples' resilience, capacities for action, and resources to meet challenges. In other words, the concept of WB aims at the overall quality of life of a person and the extent to which they make meaningful and purposeful contributions to the world (World Health Organization, 2021). Users often seem to use SM to pass time and seem to spend hours on their smartphones without contributing anything meaningful to the world or themselves. Therefore, it could be assumed that SM use leads to worsened WB. However, the relationship between SM use and WB is not that easily explained.

Several studies investigated the relationship between SM use and aspects of WB, whereby different results were found. On the one hand, SM use seems to have a negative influence on WB or facets of WB. Lin et al. (2016) demonstrated that SM use was significantly

associated with increased depression in a sample of young adults. Also, McDool et al. (2016) showed that spending more time on SM reduces children's satisfaction with life. On the other hand, literature argues that SM use can have positive effects on WB. According to Bolton et al. (2013), SM use increases users' WB by giving them a sense of community. In line with that, Roberts and David (2020) found that SM use which fosters social connection increases WB in college students. However, Ostic et al. (2021) demonstrated that negative and positive effects of SM use can coexist. As there is evidence for both, a negative and a positive relationship between SM use and WB, this paper aims at identifying circumstances in which SM use can be beneficial and circumstances in which SM use can be detrimental for users' WB.

Supposing SM use has a direct, one-sided impact on WB might be too simple to draw conclusions. Therefore, it is important to consider the context of SM use, making research more user-oriented (Berryman et al., 2018; Bolton et al., 2013; Coyne et al., 2020; Valkenburg et al., 2022). Most SM users are young adults, of whom 93% already used SM in 2018 (Rideout, Fox, & Well Being Trust, 2018). Although there are differences by platform, Snapchat is, for example, used by 65% of 18-29 years old and comparatively only by 2% of people aged 65 or older (Auxier & Anderson, 2021). Since the majority of university students consist of young adults and various studies show that SM use influences students' WB, this study will focus on university students only (Hawi & Samaha, 2017; Roberts & David, 2020; Zhao, 2021). Considering the context of SM use, different motivations for SM use and its consequences should be determined.

As explained by the Uses- and Gratification framework by Katz et al. (1973a), SM users are goal-oriented and, actively use SM to satisfy their individual needs. Brandtzæg and Heim (2009) found that users' informational, entertainment, personal identity and social needs are base expectations for using SM, which drive SM use. Additionally, users' fear of missing out leads to increased WB if SM use fosters social connection and thus, satisfies users' need to belong (Roberts & David, 2010). Based on this, it can be suggested that different needs can be drivers for SM use, which can vary in strength and thus, be fulfilled to different degrees. Implying that SM serves as a tool for need fulfilment, it could be inferred that SM use leads to improved WB among those, who perceive their individual needs as satisfied.

Besides the general debate, on whether SM use leads to increased or decreased WB, several studies found side effects of SM use, which in turn might lead to decreased WB in the long run. SM use is associated with poor sleep, which permanently results in increased symptoms of depression (Kelly et al., 2018). Additionally, SM use leads to worsened WB in those users who developed feelings of envy (Valkenburg et al., 2021). Furthermore, Hawi and

Samaha (2017) found a negative association between addictive SM use and self-esteem, with the latter having a positive relationship with satisfaction of life. Therefore, it could be considered that not SM use itself, but negative side effects of SM use will lead to decreased WB in users. As SM use might not trigger negative side effects to the same degree in different users this could explain why SM use decreases WB only for some of its users.

To close the research gap, under which conditions SM use might lead to increased WB and under which conditions it leads to decreased WB, this paper aims at answering the research question: "To what extent can the fulfilment of user's needs and the negative side effects of social media use explain the relationship between social media use and well-being?".

2. Theoretical framework

2.1 Users' needs and social media

As already described by Maslow (1943) humans are goal-directed beings and act with the motivation of satisfying certain needs. This is also supported by Self-Determination Theory, which sees the satisfaction of needs as a requirement for autonomous motivation, growth and wellness (Deci & Ryan, 2012). Gröpel and Kuhl (2009) showed that a healthy work-life balance only leads to improved WB if it fulfils personal needs. Even though the study refers to a different context, it supports the thesis that needs satisfaction is closely related to WB. According to the Uses- and Gratification framework, this is also the case when it comes to SM usage (Katz et al., 1973a). The intensity of different needs motivates SM usage to the extent to which SM platforms satisfy users' needs. Katz et al. (1973b) identified different categories of needs that drive SM use that are referred to and supported in various studies, although the needs are labelled differently. This study will focus on users' need for information, entertainment, personal identity and socialisation as it is assumed that SM offers many opportunities to satisfy them (Brandtzæg & Heim, 2009).

Informational needs, also called cognitive needs, are related to finding information, deepening understanding, and getting new knowledge (Katz et al., 1973b). Park et al. (2009) emphasise that information seeking is an important motivator for SM use, which is underlined by Ali et al. (2020), Shao (2009), and Al-Menayes (2015a). SM users indicated to use SM to consume information or debate with other persons in online forums (Brandtzæg & Heim, 2009). Furthermore, users might use SM to ask others for advice in group chats or support forums. As found by Wang et al. (2012), SM use significantly satisfies users' informational needs. Therefore, it is hypothesized:

H1: The relationship between SM use and WB is mediated by the fulfilment of informational needs.

Users' entertainment needs, also labelled emotional or affective needs, demonstrate users' tendencies to seek pleasurable experiences, like enjoyment and amusement on SM (Katz et al., 1973b). Several studies suggest that users' need for entertainment is one of the main motivators for SM use (Al-Menayes, 2015a; Brandtzæg & Heim, 2009; Park et al., 2009; Shao, 2009). In a study by Whiting and Williams (2013), 64% of the respondents indicated using SM for humour and relief, which is also part of the need for entertainment. Apart from seeking fun, users also access SM to pass time (Brandtzæg & Heim, 2009). Since many SM platforms are designed for entertainment purposes, e.g. Instagram, on which many meme pages get popular by posting funny videos, it is assumed that SM has the potential to fulfil users' need for entertainment. This is reflected in a study from Wang et al. (2012), who showed that SM use satisfies users' emotional needs. As it is expected that the fulfilment of users' need for entertainment will lead to increased WB, the following hypothesis will be tested:

H2: The relationship between SM use and WB is mediated by the fulfilment of entertainment needs.

SM use is also driven by users' personal identity needs, or similarly, personal integrative needs (Ali et al., 2020; Katz et al., 1973b). The need for personal identity can be defined as users' desire " to present their true or inner self to the outside world and to have others know them as they know themselves" (Shao, 2009, p. 14). SM provides many possibilities to express oneself because users can create their own profiles, upload pictures and videos, and share information about themselves. To a certain extent, users can decide for themselves who they want to be or how they want to be perceived by others as they are free in their choice of what they want to share. Thus, SM provides an opportunity to create an identity different or similar to oneself in real life (Hongladarom, 2011). As it is assumed that SM fulfils users' need for personal identity by giving freedom to create one's own identity, it is hypothesised:

H3: The relationship between SM use and WB is mediated by the fulfilment of personal identity needs.

The last category of needs is social needs (Katz et al., 1973b; Wang et al., 2012). These describe users' desire to maintain contact and interact with significant others or other SM users in general (Katz et al., 1973b). As the term 'social media' already suggests, social reasons are one of the main motivations for users to participate in SM use (Ali et al., 2020; Bolton et al., 2013; Whiting & Williams, 2013). According to Brandtzæg and Heim (2009), users underline using SM to find new friends and maintain contact with family and friends. As SM offers many opportunities to build social connections through various chat and comment functions, like-buttons, group chats, live streams or video call functions, long distances do not seem to matter

anymore. Accordingly, studies show that SM has mostly positive effects on users if it fosters social connection, satisfies users' need to belong or gives users a sense of community and support (Bolton et al., 2013; Roberts & David, 2020). Therefore, it is suggested that SM has the potential to fulfil users' social needs and thus, increase users' WB. It is suggested:

H4: The relationship between SM use and WB is mediated by the fulfilment of social needs.

2.2 Side effects of social media use

SM use might not directly lead to decreased WB, but might lead to negative side effects, which in turn could lead to decreased WB. Investigating literature, the following side effects seem to occur most frequently as a result of SM use.

The first side effect resulting from high SM use is sleep disturbances (Woods & Scott, 2016). Users often sleep with their smartphones in their bedroom (Lenhart et al., 2010) get disturbed by incoming messages (Thomée et al., 2010; Van Den Bulck, 2004) or perceive pressure and fear of missing out on relevant messages (Thomée et al., 2010), which hinders them from falling asleep or sleeping well. As research shows that sleep quality is an important predictor of WB (Graham & et al., 2021; Hanson & Ruthig, 2012), it is expected that:

H5: The relationship between SM use and WB is mediated by sleep disturbances.

Secondly, SM use might trigger feelings of malicious envy in its users, which in turn might lead to decreased well-being. Malicious envy can be defined as "a blend of unpleasant and painful feelings characterized by inferiority, hostility, and resentment caused by comparison with others who possess something the envier desires" (Smith & Kim, 2007, p. 49). According to this definition, social comparison seems to be the prerequisite resulting in malicious envy. As SM offers many opportunities to compare oneself consciously or unconsciously with others, e.g. comparisons with the lifestyle of travel bloggers, envy might occur as a result of SM use. This is underlined by studies, that show that more intensive Facebook use is associated with stronger feelings of envy, which in turn lead to increased feelings of depression (Tandoc & Goh, 2021). Moreover, malicious envy is associated with dissatisfaction with life, hostility, inferiority, anxiety and anger (Wu & Srite, 2021). Since malicious envy seems to lead to many negative emotions it could be assumed that it might also decrease well-being. Therefore, it is hypothesised that:

H6: The relationship between SM use and WB is mediated by feelings of malicious envy.

The last side effect, covered in this paper, is SM addiction, which can be described "as an internet addiction, where individuals exhibit a compulsion to use social media to excess" (Griffiths, 2000; Starcevic, 2013, as cited in Hou et al., 2019, p.2). A study by Gezgin (2018) showed that the daily duration of social networking site usage predicts SM addiction. The

development of SM addiction can be explained by the theory of operant conditioning. According to this theory, a certain behaviour gets habitual, or in this case addictive, when it has positive consequences for the individual (Staddon & Cerutti, 2003). In relation to SM, this means that SM use becomes an addiction if it gives the user positive feelings that encourage to further usage. As SM offers many rewards, e.g. in form of likes, users might access SM more likely because they connect it with positive experiences and thus, become addicted (Staddon & Cerutti, 2003). As research suggests that problematic SM use has a negative effect on WB (Boer & et al., 2021; Dhir et al., 2010; Young et al., 2020), it can be assumed:

H7: The relationship between SM use and WB is mediated by SM addiction.

2.3 Theoretical model

Based on the literature and the hypotheses, a research model emerges that contains possible mediators of SM use and WB (Figure 1). A positive influence of SM use on need fulfilment as well as on negative side effects is expected. In addition, it is assumed that needs fulfilment is positively, and negative side effects of SM use are negatively associated with WB.

Figure 1. *Research Model of the Relationship between SM use and WB mediated by Needs Fulfilment and Negative Side Effects.*
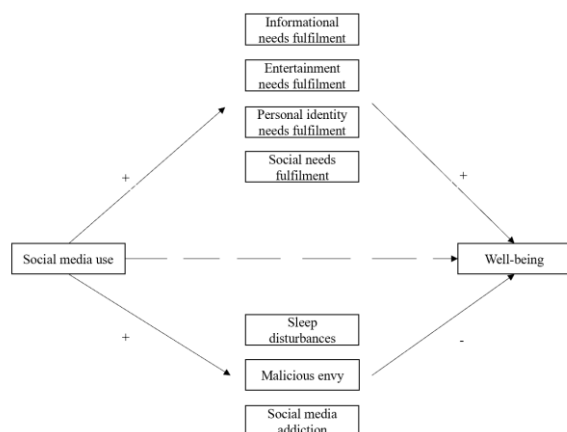
3. Method

3.1 Design

A correlational survey design was chosen to answer the research question and test the hypotheses. The independent variable was *social media use*, the dependent variable was *well-being* and the mediating variables consisted of users' needs fulfilment, which were *informational needs fulfilment*, *entertainment needs fulfilment*, *personal identity needs fulfilment*, and *social needs fulfilment* and side effects, namely *sleep disturbances*, *malicious envy*, and *social media addiction*.

Ethical approval by the ethical committee of the BMS faculty of the University of Twente was obtained before recruiting the participants. All participants digitally signed an informed consent form and took the same online questionnaire.

3.2 Participants

This study comprised a sample of 156 university students. Criteria for voluntary participation included a minimum age of 18 and enrolment at a university. The questionnaire was circulated in English to include international university students as well. Non-random convenience sampling was used by recruiting participants via social media platforms (e.g. Instagram, WhatsApp), where the researcher shared the link to the survey. Additionally, the test subject pool offered by the University of Twente (SONA system) was used, where university students could participate in exchange for 0.25 credit points. Furthermore, participants were recruited via the snowball technique as participants were invited to share the link of the study with their friends. By clicking on the link, participants were directed to the Qualtrics survey.

Data from 33 participants were excluded from the dataset because they did not agree to the informed consent or answered less than 80% of the questionnaire. The final dataset consisted of data from 123 participants. Of these, 74 were female (60%), 48 were male (39%), and one participant stated to be of another gender. The majority of participants were German (103; 84%), 16 were Dutch (13%), and a minority of participants had a different nationality (4; 3%). The age ranged from 18-28 years, with the mean age being 21 years (*SD*=2.00).

Considering the characteristics of SM use, 121 of the participants access SM through their smartphones (98%), 46 through their laptops (37%) and 26 through their tablets (21%). Nine participants mentioned accessing SM through other devices (6%), namely desktop pc, Nintendo Switch and TV. On average, participants had been using SM for 8.2 years (*SD*= 2.5).

3.3 Procedure

At the beginning of the survey, participants were introduced to the general aim of the survey (SM use and WB). Participants were not yet informed about the role of needs fulfilment and side effects to not bias their answers. After participants gave their informed consent, they were shown a list of example SM platforms to ensure that they understood which platforms are covered by the term 'social media' and to stimulate reflection (Appendix A).

Then, they were asked questions about their general SM use. After that, participants answered items measuring SM addiction, needs importance and satisfaction (section 3.4). The order of questions was chosen to give users the feeling that all the questions are covering their

general SM use to hide the full purpose of the study and not bias participants' answers. For this reason, items related to the different side effects were not asked directly after each other.

Next, participants were shown the heading 'well-being' to demonstrate that they have reached the second part of the study to maintain their attention. Participants were asked questions about their WB, malicious envy and sleep quality. Then, they were asked demographic questions about their nationality, gender, and age.

Lastly, participants were thanked for their participation and debriefed about the full aim of the study (side effects and needs fulfilment). They were informed that they could still withdraw from participation and were given the researchers' contact information. Participants were invited to share the link of the study and asked to not talk to other potential participants about the study to not influence their responses.

3.4 Instrument

An online survey was created using the software Qualtrics. The questionnaire consisted of informed consent, scales related to participants' SM use, their needs importance, perceived needs satisfaction, side-effects, WB, demographics, and a debriefing. In total, the questionnaire contained 56 items and took participants approximately 15 minutes to complete. The study included nominal, interval, and ratio scales. To make the questionnaire more coherent, items that were originally phrased in the third person were reworded so that the entire questionnaire was written from the first-person perspective. This was intended to facilitate participants' identification with and reflection on SM use and WB. Additionally, items containing terms like 'social networking sites' were replaced by the term 'social media' to ensure that both, social networking sites and instant messengers are included.

Two items measured participants' ***SM use*** by asking about the days per week they use SM and the minutes per day spent on SM. To create the independent variable *SM use* both items were multiplied and converted into the number of hours users spend per day on SM.

The four needs were measured using several existing scales related to driving needs of SM use as orientation. As there could be variances in the strength of participants' needs, every need was measured first by its importance and then by its satisfaction. The importance of each need was assessed with "For me, social media is important…". Items of need satisfaction started with "I am satisfied with the extent to which social media gives me…". For consistency reasons, all items could be rated on a five-point Likert scale ranging from 1= strongly disagree to 5= strongly agree. The different mediation variables of need fulfilment were constructed by multiplying the mean score of the need importance scale with the score of the item measuring need satisfaction. Finally, the square root was taken to simplify interpretation.

To measure participants' ***informational needs importance***, six items were used, for example, "For me, social media is important to gain knowledge". The first two items were inspired by Gupta and Bashir's (2018) Informativeness Scale, the next two items were based on Ali et al.'s (2020) Cognitive Needs Subscale and the last two items were added by the researcher based on the description of informational needs.

Entertainment needs importance was measured with five items based on Leung's (2003) Entertainment Subscale, for example, "For me, social media is important to have fun or a good time". Due to concerns that the sixth item "For me, social media is important to feel less tense" is too overlapping with WB, this item was excluded and only five items were used.

Personal identity needs importance was measured using the Personal Integrative Needs Subscale (Ali et al., 2020). The scale consisted of four items, like "For me, social media is important to portray an image of me to others".

Social needs importance were measured using an adaption of the Social Integration Subscale developed by Ali et al. (2020). In total, five items were assessing participants' social needs, for example, "For me, social media is important to communicate with my friends".

Inspired by Al-Menayes (2015a), who measured participants' ***need satisfaction*** with one single item, four items were developed to measure need satisfaction. Each item was specifically related to one of the needs, describing them in terms of their definition. For example, social needs satisfaction was assessed with "I am satisfied with the extent to which social media gives me a sense of connection with family, friends, and the world".

For the construction of the mediation variables belonging to side effects of SM use, the mean score of each scale was used. To measure participants' ***sleep disturbances*** five items rated on a frequency scale (1= never; 2= rarely; 3= often; 4= very often) were used. Items were adopted from Vazsonyi et al. (2015) and related to participants' sleep during the last 12 months, for example, "During the last 12 months, I have had trouble falling asleep at night".

Malicious envy was measured with five items. The items were adopted from the Benign and Malicious Envy Scale (Lange & Crusius, 2015), but only items referring to malicious envy were used as benign envy is not of interest in this study. Participants answered items like "I wish that superior people lose their advantage" on a five-point Likert scale (1= strongly disagree to 5= strongly agree). Originally, the items were measured using a six-point Likert scale, which was changed to prevent confusion among participants since most of the other concepts of this study were also measured with a five-point Likert scale.

SM addiction was assessed with six items. All items were based on the Bergen Social Networking Addiction Scale (Andreassen et al., 2016), but changed into statements. This was

decided to use a five-point Likert scale (1= strongly disagree to 5= strongly agree) instead of the original frequency scale, to make the study more consistent and not mislead participants. The items referred to participants' last 12 months and included, for example, "During the last 12 months, I have felt an urge to use social media more and more".

To not stretch the study too long to avoid participants losing their attention, it was of importance to measure *WB* with as few items as possible. Therefore, the Oxford Happiness Scale – Short Form was used as a measure of WB (Hills & Argyle, 2002). The scale consists of eight items, like "I am well satisfied about everything in my life". The original scale makes use of a six-point Likert scale, whereas a five-point Likert scale (1= strongly disagree to 5= strongly agree) was used for consistency purposes in this study. The mean score was used to construct the dependent variable *well-being*.

3.5 Scale construction: Exploratory factor analysis

Since the different scales were not used in this combination before, it was necessary to check if the scales work as intended in this context. An exploratory factor analysis was conducted to verify that the associated items were distinguishable from each other and not related to the same concepts (Appendix B). As many changes were made in the original-developed scales, like the usage of a different Likert scale, the factor analysis was used as an indication if the different scales are suitable for use in this sample. In total, factor analysis was conducted with 32 items belonging to the scales measuring the importance of the four needs, side effects, and WB. As SM use was only measured by two string variables, those were not included in factor analysis. Also, needs satisfaction was excluded from factor analysis because it was measured by only one item per need and thus, does not form its own scale.

The Kaiser-Meyer-Olkin measure of sampling adequacy was .72 and Barlett's test of sphericity was significant ($\chi2$ (496) = 1535.72, *p*<.05), which indicates that the data is suitable for factor analysis. The diagonals of the anti-image correlation matrix were above .5 for most of the items. Items, with a score below .5, were excluded from factor analysis except for the item "For me, social media is important to communicate with friends" as it is assumed that this is of great importance regarding its content. Lastly, the communalities were all above .3 showing that each item shared at least some common variance with another item. Items, which showed communalities below .3 were excluded from data analysis. Additionally, confounding items, which did not clearly load on one factor were excluded, as there was no guarantee that they measure the intended concept.

Principal component analysis with varimax rotation was used to simplify the interpretation of factors. The number of factors was limited to eight factors as it was predefined

which item belongs to which scale. Initial eigenvalues showed that the first four factors could explain around 19%, 9%, 8% and 6% and each of the last four factors between 4-5%. In total, the eight factors could account for around 63% of the variance.

After checking the exclusion criteria, only three of the original six items measuring *informational needs importance* remained for data analysis (Appendix C). Since half of the items did not clearly measure the informational needs of participants, the scale showed marginally adequate reliability (α= 0.66). All the remaining items clearly load on the seventh factor with factor loadings above .7 (Appendix B).

One of the five items measuring participants' *entertainment needs importance* was excluded from data analysis as it did not pass the exclusion criteria (Appendix C). The four remaining items showed acceptable reliability with Cronbach's alpha being above 0.7 (α= 0.79). Each of the four items loads on the third factor with factor loadings above .65 (Appendix B). However, the third item of that scale also loads on the first factor (SM addiction) with a factor loading of .34. As the same item has a factor loading of above .8 for factor seven, it is assumed that this item is better explained by the seventh factor and was kept for analysis.

All four items belonging to the scale of participants' *personal identity needs importance* passed the criteria and remained for analysis (Appendix C). Factor loadings above .7 on the second factor show that the scale is suitable to measure the personal identity needs in this sample (Appendix B). Cronbach's alpha showed good reliability (α=0.85).

Two of the five items measuring *social needs importance* met the criteria to remain in the analysis (Appendix C). An exception was made for the item "For me, social media is important to stay in touch with family" because the diagonal of the anti-image matrix was .44 and therefore below the cut-off point of .5. However, the item showed communalities above .7 and high factor loadings on factor eight, which matched the second item measuring social needs (Appendix B). Additionally, literature showed that maintaining contact with family is one of the main reasons for using SM, which is why it is considered essential for data analysis due to its content (Brandtzæg & Heim, 2009). The reliability of the scale is only marginally adequate because the scale only consisted of two items in the end (α=0.60).

One of the five items intended to measure the *sleep disturbances* of participants was excluded (Appendix C). The scale is appropriate for measuring sleep disturbances in this sample, as each of the remaining items load on the fourth factor with factor loadings above .5 (Appendix B). According to Cronbach's alpha, the scale has acceptable reliability (α= 0.74).

Four of the five items belonging to the scale of *malicious envy* remained for data analysis (Appendix C). The four items clearly load on factor six with factor loadings above .6

(Appendix B). Only one of the items also loads on factor two (personal identity needs importance), but only showed a factor loading of around .37, which indicates a better fit with factor six. Cronbach's alpha is above .7 (α=0.73), which demonstrates acceptable reliability.

Each of the six items assessing participants' tendencies of **SM addiction** remained for data analysis (Appendix C). The items showed factor loadings above .5 and clearly load on the first factor (Appendix B). Although two of the items also load on factor two (personal identity needs importance) and one of the items on factor six (malicious envy), their factor loadings distinctly indicated a better fit for the first factor. Therefore, it was not necessary to exclude an item from data analysis. The scale of SM addiction showed acceptable reliability (α=.79).

Of the eight items measuring **WB**, six remained for data analysis (Appendix C). Factor loadings above .5 showed that the items are belonging to factor five (Appendix B). Two of the items additionally load on factor one (SM addiction) and factor eight (social needs importance). However, the factor loadings were around .3 and thus differ clearly from factor five. According to Cronbach's alpha, the scale WB has acceptable reliability (α=0.74).

4. Results

4.1 Overview of data: Descriptive statistics

For a first impression, the mean score and standard deviation of each variable were calculated (Table 1). On average, participants scored just above 2 on the independent variable *SM use*, which indicates that participants spend around 2 hours per day on SM. However, the differences between participants are large as the standard deviation shows. The mean score on the dependent variable *WB* was around 3, which shows a medium level of WB.

Considering the descriptive statistics of the mediation variables belonging to the *fulfilment of needs*, it can be noted that *social*, *entertainment* and *informational needs* are fulfilled to a similar extent. Although the needs are not completely fulfilled by SM use, they are fulfilled to a large extent. This is different for *personal identity needs*, which were fulfilled by *SM use* only to a small extent.

Looking at the side effects of SM use, participants scored on average highest on *SM addiction*. However, there were no big differences between the side effects, as mean scores of *sleep disturbances* and *malicious envy* show. None of the side effects appeared to be extremely prominent in this sample, as none of the mean scores is above 3. The average participant could neither agree nor disagree if he/she experiences one of the side effects of SM use.

Table 1. *Descriptive Statistics of the Main Variables*

	N	M	SD
SM use	123	2.08	1.45
Informational needs fulfilment	123	3.68	.76
Entertainment needs fulfilment	123	3.84	.78
Personal identity needs fulfilment	123	2.33	.84
Social needs fulfilment	123	3.92	.70
Sleep disturbances	123	2.27	.61
Malicious envy	123	2.19	.73
SM addiction	123	2.94	.87
WB	123	3.31	.67

Note. All constructs were measured on a 5-point Likert scale except for SM use (hours per day), and sleep disturbances (4-point Frequency scale).

4.2. Correlations

To check how the variables are related to each other, Pearson correlations were calculated (Table 2). The correlation table showed non-significant correlations between the independent variable *SM use* and the dependent variable *WB*.

However, significant relationships could be found between the independent variable *SM use* on some of the mediation variables. Weak positive correlations could be observed between *SM use* and three of the need fulfilment variables, namely *informational needs fulfilment*, *entertainment needs fulfilment* and *personal identity needs fulfilment*. Considering the side effects of SM use, only one significant relationship was detected. That is a weak positive correlation between *SM use* and *SM addiction*.

Furthermore, significant correlations could be found between all three mediators belonging to the side effects of SM use and *WB*. Thus, *sleep disturbances*, *malicious envy* and *SM addiction* showed weak negative correlations with *WB*. No significant relationship could be found between the mediation variables of needs fulfilment and *WB*.

Additionally, significant correlations could be detected among the different mediation variables. Starting with the mediation variables belonging to need fulfilment, *informational needs fulfilment* showed weak positive correlations with *entertainment needs fulfilment, social needs fulfilment* and *SM addiction*. Furthermore, there was a weak positive correlation between *entertainment needs fulfilment, personal identity needs fulfilment* and *SM addiction. Personal identity needs fulfilment* was weak positive correlated *with social needs fulfilment, malicious*

envy and *SM addiction*. The last need, *social needs fulfilment*, displayed a weak positive correlation to *sleep disturbances*.

Considering the side effects of SM use, each of the associated mediation variables showed significant correlations with each other. *Sleep disturbances* were weak positive correlated with *malicious envy* and *SM addiction*. Furthermore, a weak positive correlation was found between *malicious envy* and *SM addiction*. Overall, no moderate or strong correlations could be found between any of the variables.

Table 2. *Pearson Correlation Coefficients of the Main Variables*

	SM use	Information	Entertainment	Pers. identity	Social	Sleep disturb.	Mal. envy	SM addiction	WB
SM use	1	-	-	-	-	-	-	-	-
Information	.310**	1	-	-	-	-	-	-	-
Entertainment	.382**	.358**	1	-	-	-	-	-	-
Pers. Identity	.234**	.146	.210*	1	-	-	-	-	-
Social	.161	.181*	.145	.248**	1	-	-	-	-
Sleep disturb.	.157	.138	-.027	.061	.202*	1	-	-	-
Mal. Envy	-.048	.058	.121	.382**	.141	.245**	1	-	-
SM addiction	.244**	.207*	.368**	.309**	.100	.220*	.344**	1	-
WB	.010	-.051	-.065	.006	.043	-.275**	-.265**	-.278**	1

Note. $*p<0.05$; $**p<0.01$.

4.3 Hypothesis testing: Mediating role of need fulfilment and side effects of SM use

Multiple mediation analysis was performed to investigate whether the relationship between the independent variable *SM use* and dependent variable *WB* is explained by the mediators *informational*, *entertainment*, *personal identity* and *social needs fulfilment* and negative side effects of SM use, namely *sleep disturbances*, *malicious envy* and *SM addiction*. After reviewing the four assumptions of linear regression, Hayes' (2018) PROCESS macro was executed with the statistical software SPSS using Bootstrapping with 5000 samples to test the hypotheses. It was predicted that *SM use* positively predicts the fulfilment of users' needs and side effects of SM use. Moreover, it was expected that need fulfilment positively predicts users' *WB* and that the side effects negatively predict users' *WB*. Therefore, the different mediators should explain the negative and positive relationship between *SM use* and *WB*.

expectations, a non-significant relationship between the independent variable *SM use* and dependent variable *WB* could be found and further investigations of possible mediators seem contradictory as the first step of mediation analysis failed.

However, regression analysis showed significant relationships between the independent variable *SM use* and some of the mediators (Table 3). Participants who reported higher levels of *SM use* also reported significantly higher levels of *informational needs fulfilment*, *needs fulfilment* and *personal identity needs fulfilment*. Moreover, *SM use* is a significant, positive predictor of *SM addiction*.

Considering the mediation variables and their influence on the dependent variable *WB*, only the side effects of SM use turned out to be significant. In line with the theoretical model, participants who reported higher levels of *sleep disturbances*, *malicious envy* or *SM addiction*, reported lower levels of *WB*.

Overall, no evidence was found that *SM use* has an influence on users' *WB*, which rules out possible mediation effects. Therefore, all hypotheses were rejected.

Table 3. *Regressions of Associations Between the Main Variables*

Variable	*B*	*SE*	t	p	95% CI
Main effect					
SM use	.024	.046	.520	.604	[-.067, .115]
Effects of SM use					
SM use → Information	.161	.045	3.573	.001**	[.072, .250]
SM use → Entertainment	.204	.045	4.515	.000**	[.114, .293]
SM use → Pers. Identity	.135	.051	2.631	.010*	[.033, .237]
SM use → Social	.078	.043	1.809	.073	[-.007, .164]
SM use → Sleep disturb.	.066	.038	1.752	.082	[-.009, .142]
SM use → Mal. envy	-.026	.046	-.574	.567	[-.116, .064]
SM use → SM addiction	.146	.053	2.748	.007**	[.041, .251]
Antecedents of WB					
Information	-.008	.084	-.091	.928	[-.174, .159]
Entertainment	-.032	.088	-.367	.715	[-.207, .142]
Pers. Identity	.107	.079	1.347	.181	[-.050, .264]
Social	.102	.088	1.169	.245	[-.071, .276]
Sleep disturb.	-.233	.103	-2.270	.026*	[-.436, -.030]
Mal. envy	-.191	.093	-2.053	.042*	[-.375, -.007]
SM addiction	-.163	.077	-2.105	.038*	[-.316, -.010]

Note. p<0.05*; p<0.01**; CI= confidence interval; →= X effect on Y.

5. Discussion

5.1 Main findings

Since literature is divided on whether SM use leads to an improvement or deterioration in WB, the purpose of this study was to find conditions explaining this relationship. Therefore, this study aims at answering the research question "To what extent can the fulfilment of users' needs, and the negative side effects of social media use explain the relationship between social media use and well-being?". Against expectations, results indicated that SM use has no significant influence on users' WB. Therefore, the conduction of a mediation analysis was redundant and the hypotheses predicting mediation effects of informational, entertainment, personal identity, social needs fulfilment and sleep disturbances, malicious envy and SM addiction were rejected. However, regression analysis revealed that users, who spend more time on SM feel higher levels of informational, entertainment and personal identity needs fulfilment. Additionally, higher levels of SM use were associated with higher levels of SM addiction. Another important finding was that users who experience higher levels of sleep disturbances, malicious envy or SM addiction reported significantly lower levels of WB.

5.2 Theoretical and practical implications

The results are similar to the results from a study by Coyne et al. (2020), who showed in an eight-year longitudinal study that time spent on SM does not have an impact on mental health. Moreover, Berryman et al. (2018) did not find an association between SM use and mental health among young adults. Nevertheless, the results partly fit the theoretical model despite the lacking main effect of the independent variable SM use on the dependent variable WB. SM use is significantly related to three out of the four tested needs fulfilment. Surprisingly, no significant relationship could be found between SM use and social needs fulfilment although studies suggest social motives as the main reason for using SM (Ali et al., 2020; Whiting & Williams, 2013). However, in this study, SM had the potential of fulfilling users' informational, entertainment and personal identity needs to a certain extent. This is in line with a study by Wang et al. (2012), who found that SM satisfies users' entertainment and informational needs but not their social needs. Additionally, they found that users' needs accumulate over time and drive future SM use. Therefore, it cannot be ruled out that the relationship between SM use and need fulfilment is bidirectional as it could be that users with high needs automatically spent more time on SM as they feel a stronger need of satisfying them. This suggestion is underlined by the fact that none of the mediation variables belonging to needs fulfilment was significantly associated with WB. Thus, it can be concluded that need fulfilment does not have any influence on users' WB but might predict further SM use of users.

Considering the side effects of SM use, only SM addiction was positively predicted by SM use, although all side effects appeared to be negative predictors for WB. Participants had already a lot of experience with SM use, as they were using it on average for 8 years. Therefore, it could be suggested that they are aware of the risks of SM use, which might protect them from developing negative side effects. Notably, SM addiction is the only variable that is significantly related to both, SM use and WB and thus, meets at least some of the criteria of being a mediator. Outstandingly, correlations showed also significant relationships between entertainment, personal identity needs fulfilment and SM addiction. These results are in line with results from a study by Zhao (2021), who found that entertainment use leads to higher levels of SM addiction, and in turn, decreases WB. Also, Al-Menayes (2015b) found that satisfaction with time spent on SM is positively related to SM addiction in university students, which further leads to worsened academic performance. Concludingly, it seems like need fulfilment triggers further SM use, which in turn might lead to more SM addiction, and thus decreases WB.

Practically, these results imply that SM users should become aware of why they are using SM and ask themselves whether SM is the only way to satisfy these needs. Universities should offer alternatives for need fulfilment, such as sports programs to fulfil students' entertainment needs, to prevent the development of a SM addiction. Overall, attention should be directed to sleep disturbances and malicious envy as they significantly decrease WB.

5.3 Limitations

Caution should be exercised when generalizing the results of this study because there are some limitations. First, the sample of this study was relatively small, which could increase the likelihood of making a type II error. Secondly, several items were excluded from data analysis, which may have resulted in some scales not measuring every facet of a concept. For example, this might have been the case for the social needs importance scale, which consisted of only two items in the end. Also, Cronbach's alpha showed that reliability for most of the scales is only acceptable, while reliability for the scales social and informational needs fulfilment was even marginally adequate. Third, the measure for SM use might not be ideal, as users might show differences in interacting with SM, which could not be assessed by the time they spend on SM per week. Additionally, results were based on self-reported estimations of participants, which might not be an accurate, reliable indication of their actual screen time. Furthermore, participants might not be fully able to properly assess their needs, as some of the needs might also be unconscious drivers for SM use. Lastly, participants might not be fully honest about their answers, because it may be difficult for some to admit, for example, feelings of malicious envy. Therefore, the results might be biased.

5.4 Suggestions for future research

Future research should focus on the assumption of a bidirectional relationship between SM use and need fulfilment, which might result in SM addiction. Besides, researchers should be open to different study designs including experience sampling and the addition of a control group to get more powerful results. Special attention should be paid to the measures of SM use and need fulfilment to increase reliability. Also, more studies should be conducted in different population groups (e.g. elderly) with less SM experience, to identify differences between different users and thus be open to alternative pathways explaining the multifaced relationship between SM use and WB including factors buffering the relationship between SM use and WB.

5.5 Conclusion

To conclude, this study helped to understand the relationship between SM use and WB a little more. Although the research question could not be answered, as no relationship between SM use and WB was found, other relevant results were found. This study emphasises the Uses- and Gratification framework by showing that SM has potential for need fulfilment. Additionally, SM addiction could be identified as a risk factor of SM use decreasing WB. Furthermore, this study demonstrated that SM use does not necessarily result in decreased or increased WB, as most of the current literature suggests, but also could have no influence on users' WB. Thus, the existence of factors buffering the effects of SM use on WB should be explored.

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Appendices

Appendix A- List of social media platforms

First, I want to know more about your current social media use. Social media includes social networking websites and instant messengers. Therefore, I am interested in platforms like Twitter, Facebook, WhatsApp, Instagram, Snapchat, YouTube, TikTok, Pinterest, Reddit, Telegram, Discord and Jodel.

Appendix B- Rotated Component Matrix of the remaining items

	1	2	3	4	5	6	7	8
SM addiction1	.641							
SM addiction2	.587	.348						
SM addiction3	.538	.300						
SM addiction4	.759							
SM addiction5	.597					.307		
SM addiction6	.678							
Pers. Identity1		.738						
Pers. Identity2		.820						
Pers. Identity3		.796						
Pers. Identity4		.820						
Entertainment1			.656					
Entertainment2			.723					
Entertainment3	.339		.808					
Entertainment4			.822					
Sleep disturb.1				.856				
Sleep disturb.2				.654				
Sleep disturb.3				.787				
Sleep disturb.5				.589				
WB2	-.415				.560			
WB3					.661			.313
WB4					.731			
WB6					.685			
WB7	-.386				.548			

Label				
Mal. envy2		.751		
Mal. envy3		.623		
Mal. envy4	.367	.604		
Mal. envy5		.735		
Information1			.714	
Information2			.746	
Information3			.819	
Social1				.753
Social2				.797

Note. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Appendix C- Scales based on exploratory factor analysis

Label	Content	Status
Informational needs importance1	For me, social media is important to read news.	Remained
Informational needs importance2	For me, social media is important to get study related information.	Remained
Informational needs importance3	For me, social media is important to gain knowledge.	Remained
Informational needs importance4	For me, social media is important to get information about others.	Excluded
Informational needs importance5	For me, social media is important to get information about events or organizations.	Excluded
Informational needs importance6	For me, social media is important to ask for advice.	Excluded
Entertainment needs impotance1	For me, social media is important to have fun or a good time.	Remained
Entertainment needs importance2	For me, social media is important to pass time away when bored.	Remained
Entertainment needs importance3	For me, social media is important to get entertained.	Remained
Entertainment needs importance4	For me, social media is important to relax.	Remained
Entertainment needs importance5	For me, social media is important to keep me company when my family and friends are not available.	Excluded
Personal identity needs importance1	For me, social media is important because it is part of my self-image.	Remained
Personal identity needs importance2	For me, social media is important to portray an image to me to others.	Remained
Personal identity needs importance3	For me, social media is important because people can use it to judge me.	Remained

Personal identity needs importance4	For me, social media is important to gain favourable approval among friends.	Remained
Social needs importance1	For me, social media is important to communicate with friends.	Remained
Social needs importance2	For me, social media is important to stay in touch with family.	Remained
Social needs importance3	For me, social media is important to add new friends.	Excluded
Social needs importance4	For me, social media is important to find more interesting people than in real life.	Excluded
Social needs importance5	For me, social media is important to get through to somebody who is hard to reach.	Excluded
Sleep disturbances1	During the last 12 months, I have experienced problems with sleep.	Remained
Sleep disturbances2	During the last 12 months, I have felt sleepy/tired or felt like sleeping all day long.	Remained
Sleep disturbances3	During the last 12 months, I have had trouble falling asleep at night.	Remained
Sleep disturbances4	During the last 12 months, I woke up during the night.	Excluded
Sleep disturbances5	During the last 12 months, I have had an uneasy sleep (including nightmares).	Remained
Malicious envy1	Envious feelings cause me to dislike the other person.	Excluded
Malicious envy2	I wish that superior people lose their advantage.	Remained
Malicious envy3	If other people have something that I want for myself, I wish to take it away from them.	Remained
Malicious envy4	I feel ill will towards people I envy.	Remained
Malicious envy5	Seeing other people's achievements makes me resent them.	Remained
SM addiction1	During the last 12 months, I have spent a lot of time thinking about social media or planned use of social media.	Remained
SM addiction2	During the last 12 months, I have felt an urge to use social media more and more.	Remained
SM addiction3	During the last 12 months, I have used social media in order to forget about my personal problems.	Remained
SM addiction4	During the last 12 months, I have tried to cut down on the use of social media without success.	Remained

SM addiction5	During the last 12 months, I have become restless or troubled if I have been prohibited from using social media.	Remained
SM addiction6	During the last 12 months, I have used social media so much that it has had negative impact on my studies.	Remained
WB1	I feel that life is really rewarding.	Excluded
WB2	I do not feel particularly pleased with the way I am.	Remained
WB3	I am well satisfied about everything in my life.	Remained
WB4	I do not think I look attractive.	Remained
WB5	I find beauty in some things.	Excluded
WB6	I can fit in everything I want to.	Remained
WB7	I feel fully mentally alert.	Remained
WB8	I do not have particularly happy memories of the past.	Excluded