University of Twente

Bachelor Thesis

Social media and mental health

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July 2nd, 2020

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Abstract

The average social media usage has increased throughout the last years and is expected to increase even further. Alongside, social media usage is presumed to be negatively correlated with the individual's level of body dissatisfaction, which is assumed to be a primary risk factor for developing an eating disorder. However, previous research suggests that individuals with a high level of self-esteem are less prone to this negative impact of social media usage and females are even more so.

Based on these findings, this research is aimed at getting a more detailed insight into the interplay of social media usage and females' level of body dissatisfaction, moderated by their level of self-esteem.

A quantitative online survey (Qualtrics) was created, wherefore participants N=141 were sampled by convenience sampling. This survey consisted of the BSQ-34 as well as Rosenberg's self-esteem scale, which were combined in a cross-sectional design. These were used to collect females' attitude towards their own body and their level of self-esteem by parallelly asking them of their social media usage.

Afterwards, the obtained data were analyzed by the statistical software program SPSS. The moderation in itself was examined with Hayes PROCESS macro analysis, the direct relation was analyzed with descriptives and correlation checking.

It turned out that females who use social media more often tend to have higher levels of body dissatisfaction. Additionally, the analysis showed a significant buffering moderation effect of the variable of the individual's level of self-esteem.

Hence, these results can be used to specify research in this area because the hypothesized protective effect of the individual's level of self-esteem was confirmed. However, a greater and more diverse sample would be recommended to investigate the moderation effect of self-esteem alongside social media usage and body dissatisfaction more specifically.

2 Introduction

The prevalence of eating disorders in westernized countries has been nearly doubled since 1990, as well as the usage time of social media, has (Statista, 2020). Studies suggest social media usage as one important factor that contributes to the emergence of eating disorders by increasing the individual's level of body dissatisfaction. Feelings of body dissatisfaction are related to negative emotions as well as to a distorted self-perception, which might cause reduced calorie intake or highly intense exercising (Davey, 2014).

Additionally, research investigated the factor of self-esteem concerning social media and eating disorders (Woods, & Scott, 2016). Here, a low level of self-esteem is assumed to be another important risk factor for the emergence of eating disorders. However, previous research has not been clear in the results regarding the exact effect of self-esteem, wherefore this study will be performed (Best, Manktelow, & Taylor, 2014; Woods, & Scott, 2016).

Ultimately, social media usage might have a significant influence on the emergence of eating disorders. Further, the factor of self-esteem might have a moderation effect on this interplay but to get a deeper understanding of this interplay, it is important to start with a general definition of eating disorders. Generally, eating disorders build up an individual category within the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Here, three types of eating disorders are distinguished: Anorexia Nervosa (AN), Bulimia Nervosa (BN) and Binge-Eating disorder (BED).

All three subtypes are accompanied by a higher prevalence rate for women compared to men (Silén et al., 2020). Generally, women are seven times more likely to develop an eating disorder as men are. In 2020, 17.9% of the female population had a disordered eating pattern, whereas only 2.4% of men were affected. These numbers imply that one in six women will develop an eating disorder at some point in their life. More specifically, the lifetime prevalence is 6,2% for AN, 2,4% for BN and 0,6% for BED in women (Silén et al., 2020).

Additionally, AN, as well as BN, is related to a high mortality rate of 5 - 8% (Bulant, Hill, Velíková, Yamamotová, Martásek, & Papežová, 2020.) Here, suicides, as well as health-related deaths, are included, with the latter being responsible for 80% of this mortality rate. Both eating disorders are associated with several physiological symptoms. These include, among other kidney problems, slow heartbeats resulting from altered levels of body electrolytes or slight blood pressure. Ultimately, these somatic complaints can lead to health-related deaths in affected individuals (Bulant et al., 2020; Davey, 2014; Melioli et al., 2018; Smink, 2016).

According to the DSM-5, the diagnosis, as well as the prevalence, are based on some specific criteria (Davey, 2014). Here, the main difference between AN, BN and BED lies in the aspect

of the individual's BMI (body mass index). On the one hand, AN is diagnosed if the affected individual is underweight with a BMI below 18,5. On the other hand, the diagnosis of BN is independent of the individual's BMI because most of them are neither underweight nor overweight. For diagnosing BN, the individual's attitude towards their own body and food consumption is focused. Lastly, the determination of BED is also unrelated to BMI. However, it should be noted that affected individuals tend to be overweight because of their binge eating habits (Davey, 2014).

2.1 Risk factors

Several psychological and dispositional risk factors can contribute to the onset of eating disorders. These factors are identical for the above-explained three subtypes of eating disorders. The main difference lies in the fact that BED is unlike AN and BN not related to a high mortality rate. Nonetheless, consequences regarding psychological distress are similar in all of them.

High degrees of body dissatisfaction, is a known predictor for eating disorders (Davey, 2014). High levels are regularly related to negative emotions, which can further increase feelings of body dissatisfaction, that possibly leads to reduced calorie intake. Furthermore, high levels of perfectionism are also associated with body dissatisfaction as well as with a drive for thinness. Perfectionistic people want to have ideal body dimensions, which may cause reduced calorie intake and a distorted self-perception. Therefore, feelings of body dissatisfaction are based on perfectionism because perfectionistic people are generally more focused on their body (Davey, 2014). Overall, body dissatisfaction is one of the best-known predictors of disordered eating habits and will be measured with the body-shape questionnaire (BSQ-34) to assess the potential development of eating disorders in individuals (BSQ, 2017).

Furthermore, a low level of self-esteem also increases the risk of developing eating disorders as a high level of body dissatisfaction does (Gordon, Rodgers, Slater, McLean, Jarman, & Paxton, 2020). Overall, self-esteem is defined as the meaning someone has about himself or herself. A person with a high level of self-esteem is confident in his or her worth and abilities. Contrary, a person with a low level of self-esteem will be insecure regarding the previously-mentioned aspects (Gordon et al., 2020). Individuals who developed an eating disorder tend to see themselves in a bad light. They often feel too fat, or they suffer from having a lack of control over their eating habits or perceive their body as unattractive. This view is partly based on a low level of self-esteem. In contrast, people with a high level of self-esteem have a lower probability of developing such dysfunctional thinking patterns (Davey, 2014; Gordon et al., 2020).

Previous research indicated that these high levels of self-esteem apply more to men than to women because women are more prone to low self-esteem (Silén et al, 2020). Hence, women are

more likely to develop dysfunctional thinking patterns that are related to eating disorders. As previously mentioned, women are seven times more likely to develop an eating disorder as men are (Silén et al., 2020). Therefore, the risk factor of self-esteem was explicitly examined for females. Generally, the female's level of self-esteem tends to be lowest between 12 and 28 years, whereby the transition from childhood to adolescence is the most significant part (Gordon et al., 2020). Here, the level of self-esteem decreases until the age of 20. With 20 years, women's self-esteem starts to rise again. However, this rise is minimal and non-significant until the age of 40. Women who are older than 40 have a significantly higher level of self-esteem than younger ones (Gordon et al., 2020). Based on this, the first onset of eating disorders lies in the age range from 12 to 28 years with a peak around puberty between 16 and 19 years (Bert, Gualano, Camussi, & Siliquini, 2016; Silén, 2020). Eating disorders are more common in women, which may be caused by their low level of self-esteem. Therefore, this report will be specifically focused on women in this age range.

Finally, it is crucial to consider media influences in conjunction with the development of eating disorders. An overview from Davey in 2014 implies that the increase in the prevalence of eating disorders can be explained by the changes in the ideal female body, which is shown in the media. During the past 20 - 30 years, mass media have used thinner and thinner models for advertising purposes, who often have an average BMI below 18.

As a result, women try to imitate the media displayed ideal body shape, which is achievable for only 5% of the world's population naturally and healthily (Davey, 2014).

In particular, the usage of social media applications have been proven to increase the individual's level of body dissatisfaction and, respectively, higher the risk for developing an eating disorder (Wilksch, O'Shea, Ho, Byrne, & Wade, 2019). Generally, social media are defined as applications or websites, where individuals can share content, like quotes or pictures, or they can participate in social interactions, like group chats or open online discussions (Melioli et al., 2018).

Several studies already showed that the types of media and the average duration of consuming these media, influence the level of body dissatisfaction and the drive for thinness (Davey, 2014). Evidence suggests that watching TV shows with mainly thin actors increased the level of body dissatisfaction as well as the drive for thinness significantly. Additionally, research from 2003 confirmed the assumption that the usage time runs linearly with the rise in body dissatisfaction. As already mentioned, both concepts, drive for thinness and body dissatisfaction, have been proven to predict eating disorders (Davey, 2014).

Current studies tend to focus more on social media instead of TV shows (Wilksch et al., 2019). Nonetheless, the negative correlation between the usage time of media and the development of an eating disorder was equally confirmed (Wilksch et al., 2019). For individuals between the

age of 12 to 28 years old, the time spent on social media is, on average, about three to four hours per day. In comparison, women above 40 years spent two hours a day using social media (Statista, 2020). Consequently, adolescents and young adults are the primary at-risk group while focusing on the effects of social media usage as predicting factors on the emergence of eating disorders. Furthermore, it was shown that the usage of apps, like Instagram, Snapchat and Facebook, has continuously increased and will rise even further in the next few years. This increase in usage will be even higher in women between 12 and 28 years (Statista, 2020; Statista, 2020a).

Moreover, Santarossa and Woodruff (2017) denoted social media as an environment with multiple social comparisons, which can higher the risk for the emergence of eating disorders. Here, behaviours like scrolling throw one's profile and sharing appearance-related information are named as potential predictors (Santarossa, & Woodruff, 2017).

As previously mentioned, other studies showed a positive effect on the level of self-esteem when using the communication function of social media (Best, Manktelow, & Taylor, 2014). This result would imply that social media can protect individuals against eating disorders.

Besides, social media has been studied as a risk factor for eating disorders as well as for low self-esteem (Woods, & Scott, 2016). Research from Woods and Scott (2016) focused on the low level of self-esteem as a result of an eating disorder, which implies that self-esteem cannot be seen as a predictor with direct influence (Woods, & Scott, 2016).

2.2 This study

Because of these mixed results and different focuses regarding all three factors, more in-depth research is needed. Thereby, this report is focused on answering the following research question:

"Does social media usage, moderated by self-esteem, influence the individual's level of body dissatisfaction?"

In answering this research question, it is expected that a high level of social media usage along with a low level of self-esteem will increase the women's level of body dissatisfaction. This will, in turn, higher the risk for the emergence of an eating disorder in that specific individual. Contrary, a high level of self-esteem is expected to decrease social media's adverse effects. It will protect the individual against an increased level of body dissatisfaction, wherefore the risk of developing an eating disorder will be lower. This leads to the following hypothesis:

1. Women with a high level of social media usage will have a high level of body dissatisfaction.

2. The relationship between social media usage and body dissatisfaction is buffered by the individual's level of self-esteem.

3 Methods

3.1 Participants

The questionnaire was completed by a total number of 165 participants, who voluntary participated in the study and were recruited through convenience sampling. This was done by sharing the survey with friends and asking them to share it even further. Additionally, the survey was published in the University of Twente' online application system SONA. Here, participants got 0.25 credits for taking part in it.

The final data set was based on 141 participants, as incomplete answers were removed, and participants who withdrew their consent at the end of the survey, as well as participants who did not fulfil the inclusion criteria of being female, aged 18 to 40 years, were removed. Concerning the characteristics of the participants (see Table 1), the mean age of the participants was 23.28 (AgeSD = 3.9). The majority of the participants were German (N=119). Regarding the highest completed education, 82 participants had a high school degree (58.2%) and the remaining 41.8% are divided between less than high school degree, college, bachelor's degree and master's degree.

Table 1: *Demographic Characteristics of the Participants (N=141)*

Characteristics	N	%
MeanAge (AgeSD)	23.28 (3.9)	-
Nationality		
German	119	84.4
Dutch	4	2.8
Other	18	12.8
Highest completed education		
Less than High School	1	0.7
High School	82	58.2
College	5	3.5
Bachelor	39	27.7
Master	13	9.2

3.2 Materials

The whole survey was web-based, consisting of three subscales, where each scale was measuring one of the variables of interest (social media usage, level of body dissatisfaction and the level of self-esteem) as well as some demographic questions.

At the beginning of the online survey, the individual's average usage time of social media

was asked with seven response options, ranging from 0-29 minutes up to more than 5 hours a day (Brooks, 2015). Next, participants were asked which social media application they use most frequent. Here, they could choose between Instagram, Facebook, Snapchat, WhatsApp, Reddit and Twitter or they could use the blank field to write down another social media app. Lastly, they were asked about the main reasons for using social media. Possible answers were entertainment, relaxation, research, maintaining relationships, self-promotion, creativity or other.

In the following, participants were introduced to the body shape scale (BSQ-34). The BSQ-34 is a self-report questionnaire with 34 items regarding the individual's preoccupations concerning their body shape. It was developed by Cooper, P.J., M.J. Taylor, Z. Cooper & C.G. Fairburn (1986). The items need to be answered with a 6-point Likert scale, ranging from "*Never*" to "*Always*" (Lentillon-Kaestner, Berchtold, Rousseau, & Ferrand, 2014). Here, higher scores indicate a higher level of body dissatisfaction, which increases the risk of developing an eating disorder. Regarding the psychometric properties, the BSQ-34 was widely used and evaluated thoroughly in different countries and languages. Thereby it showed good internal reliability (test: $\alpha = .95$; retest: $\alpha = .94$), test-retest reliability ($r \geq .93$) and concurrent validity ($r \geq .70$) (Lentillon-Kaestner et al., 2014). The validity of the BSQ-34 was also assessed as acceptable (Lentillon-Kaestner et al., 2014).

Next, participants were asked to answer 10 questions concerning their level of self-esteem. Here, Rosenberg's self-esteem scale was used (Rosenberg, 1979). This scale is also a self-report questionnaire consisting of 10 items, which were scored with a 4-point Likert scale, ranging from "*Strongly agree*" to "*Strongly disagree*" (Robins, Hendin, & Trzesniewski, 2001). Final scores are between 0-30, whereby a score below 15 indicates a low level of self-esteem. Both the reliability as well as the validity of Rosenberg's self-esteem scale have been proven across multiple studies (Robins et al., 2001). Concerning the reliability, excellent internal consistency was reached with a Guttman scale coefficient of reproducibility of .92. The test-retest reliability was also excellent with correlations of .85 and .88. According to validity measures, Rosenberg's self-esteem scale had significant correlations with other self-esteem scales, like the Coopersmith Self-Esteem Inventory (Ciarrochi, & Bilich, 2006).

All of the previously mentioned subscales were combined in one questionnaire in the online program Qualtrics. After gathering enough responses, the data were analyzed in the statistical program IBM SPSS statistics 25.

3.3 Variables

This research was aimed at determining the level of body dissatisfaction as the dependent variable. Here, the individual's social media usage was the independent variable and their level of self-esteem was predicted as the moderator.

3.4 Procedure

All three subscales were combined in the online software program Qualtrics. Afterwards, participants were invited via a link. Before the survey began, the participants read and signed an informed consent form to know what to expect in the survey and how their data will be used. Here, the length of the survey, that the participants can withdraw at any time and that the information they give is completely anonymous were included (Appendix D). After signing this consent form the participants started with the survey by answering some demographic questions regarding their gender, age, nationality and highest education.

Next, participants were asked to answer three questions regarding their social media usage (Appendix C). In the following, all 34 items of the body shape questionnaire (Appendix A) and all 10 items of Rosenberg's self-esteem scale (Appendix B) needed to be answered. All of these questionnaires were started by a short introduction about the question types and the belonging answer options. The next questionnaire was locked until every previous question was answered. Otherwise, participants were not able to move forward or to finish the survey.

At the end of the questionnaire, there was a debriefing section, where the participants learnt more about the study in itself, the hypothesis, the way of testing and the importance of this study (Appendix E). The set-up of this study was approved by the ethics committee of the Behavioral, Management and Social Sciences BMS-faculty of the University of Twente.

3.5 Data analysis

The reliability of the used construct was analyzed with the reliability coefficient of Cronbach's alpha. This was done for both the body dissatisfaction scale (BSQ-34) and the self-esteem scale. The reliability of the BSQ-34 was $\alpha=0.969$ and on the self-esteem scale, it was $\alpha=0.907$.

Next, descriptive statistics were used to calculate the means and the standard deviations of the used constructs. Here, the level of body dissatisfaction, the individual's level of self-esteem as well as their social media usage were examined (Table 2).

Moreover, Pearson's correlation has been performed for checking the relationship between the level of body dissatisfaction and the individual's social media usage. This relation was significant ($r = .17$; $p < .05$). Additionally, the bivariate correlations between the individual's level of self-esteem and their level of body dissatisfaction were calculated as being significant ($r = -.56$; $p < .05$). Alongside, the correlation between social media usage and the individuals level of self-esteem was also calculated. However, this correlation was not significant ($r = -.03$; $p > .05$).

Lastly, the hypothesized buffering moderator effect was analyzed by using PROCESS (Hayes, 2013). To investigate the research question *"Does social media usage, moderated by self-*

esteem, influence the individual's level of body dissatisfaction?", a simple moderator analysis was performed.

4 Results

The obtained data were analyzed to test the above-mentioned hypotheses. To investigate the first hypothesis that individuals with a high level of social media usage will have a high level of body dissatisfaction, the Pearson correlation was checked.

4.1 Descriptive statistics

Descriptive statistics were used as a basis for the analysis. The level of body dissatisfaction has a mean value of 2.64, whereas the level of self-esteem has a mean of 2.94. Additionally, social media usage has a mean of 3.93. For the belonging standard deviations, see the table below (Table 2).

Table 2: *Means and SD's for the level of body dissatisfaction and the level of self-esteem*

Level	Mean	N	SD
Body dissatisfaction	2.64	141	.98
Level of self-esteem	2.94	141	.59
Social media usage	3.93	141	1.27

4.2 Moderation testing

By using PROCESS, the interaction between social media usage and level of self-esteem was found to be statistically significant [B= .16, s.e. = .08, p = .057, (-.33, .00), R^2 = .0175]. Here, a p-value below .10 (p < .10) is accepted as a sign moderation effect. The conditional effect of social media usage on the level of body dissatisfaction showed corresponding results. At low moderation self-esteem = -.59 the [conditional effect = .19, s.e. = .07, p = .05]. At middle moderation self-esteem = .00, the [conditional effect = .09, s.e. = .05, p = .06]. At high moderation self-esteem = .59, the [conditional effect = .00, s.e. = .08, p = .95]. The differences in the individual's level of self-esteem for the three groups can be seen in figure 1.

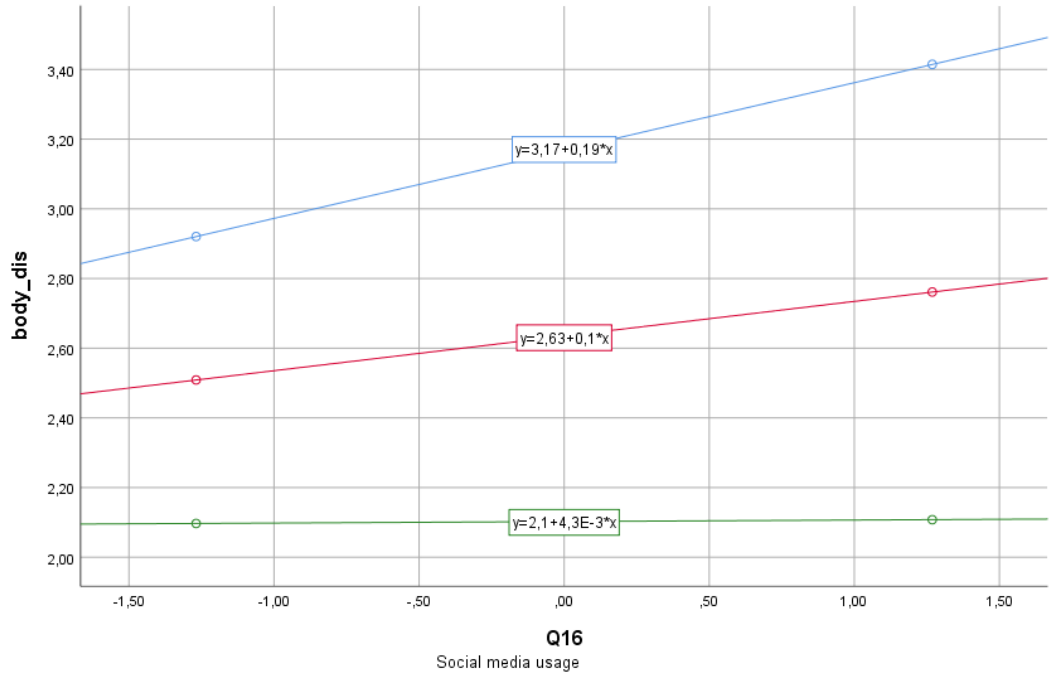

Figure 1: *The level of body dissatisfaction for the individual's level of self-esteem*

5 Discussion

In this research, it was tried to shed more light on the effect of self-esteem on the relationship between social media usage and the individual's level of body dissatisfaction as a precursor for the emergence of eating disorders. Foregoing research implies that high social media usage is negatively correlated with the emergence of an eating disorder (Wilksch et al., 2019). Nonetheless, previous study results differ regarding the effect of self-esteem on this relationship. This was analyzed by combining the body-shape-questionnaire (BSQ-34), Rosenberg's self-esteem scale and a subscale regarding the individual's social media usage into one online survey. This survey was addressed to the female population, aged above 16 years.

Based on previous study results, it was expected that women with a high level of social media usage will have a high level of body dissatisfaction and that the relationship between social media usage and body dissatisfaction is buffered by the individual's level of self-esteem.

Furthermore, the results of this study imply that individuals who use social media more often tend to have higher levels of body dissatisfaction (Figure 1). This relationship was confirmed by a significant Pearson's correlation. The correlation between social media usage and the women's level of body dissatisfaction was significant, wherefore the above-mentioned hypothesis can be accepted. Based on the level of body dissatisfaction is one of the most important risk factors for eating disorders, this result suggests that women with a higher usage time of these media will be more prone to develop an eating disorder. This study's results are in line with previous research of Wilksch et al. in 2019, who denoted that the usage time runs linearly with the rise in body dissatisfaction (Wilksch et al., 2019).

Parallelly, the results of the performed PROCESS analysis identified the individual's level of self-esteem as a buffering moderator of the relationship between social media usage and the individual's level of body dissatisfaction. According to the second hypothesis, the relationship between social media usage and body dissatisfaction is buffered by the women's level of self-esteem. This means that the negative effect of social media usage is lower in individuals who have a higher level of self-esteem. This hypothesis can be accepted based on moderator analysis. Concerning eating disorders, this would imply that high social media usage time is less serious for individuals with higher levels of self-esteem than for individuals with a low level. Accordingly, self-esteem might have a protective function to prevent the emergence of eating disorders.

The above-mentioned results of the conducted online survey about social media usage concerning the individual's level of body dissatisfaction as well as regarding their level of self-esteem may be a good basis for further research. In particular, the significant result regarding an individual's level of self-esteem as the moderator variable for the relationship between body dissatisfaction

and social media usage is helpful for further research in this field and can be used as a basis for designing interventions to higher individual's level of self-esteem.

In this case, previous studies tend to be of mixed results. On the one hand, research is in line with this study's results saying that a high level of self-esteem is often accompanied with lower levels of body dissatisfaction (Davey, 2014; Gordon et al., 2020). However, on the other hand, research from Woods and Scott in 2016 indicated the individuals' level of self-esteem just as an indirect predictor of higher levels of body dissatisfaction (Woods, & Scott, 2016).

5.1 Limitations and recommendations

Nevertheless, it is important to look at some limitations of the conducted survey. First of all, the whole study was designed in a cross-sectional way. This means that participants were compared at one single time point. Regarding this study, women's level of body dissatisfaction, their level of self-esteem and their social media usage were asked only once. Therefore, drawing causal inferences need to be done with caution. In this case, accepting higher social media usage as a predictor for higher levels of body dissatisfaction might work but the causality might also be reversed. For getting a more accurate picture of this relationship, more studies or a longitudinal study would be needed.

A second limitation refers to the sampling method. To gather enough participants, the study was published in the University of Twente's online application system SONA and was further shared with other German university students. Based on this, 58% of the total sample population has a high school degree and 28% are already bachelor graduates. Therefore, the educational level of this study's sample is rather high, compared to the average population, where just 30% achieved a high school degree and 15% a university degree (Statista, 2020b). Thus, it is recommended to conduct this survey again with a sample more similar to the average population in regards to the participant's academic level. Therefore, the study might be published in other non-university environments too, like for example supermarkets.

Another limitation, which is related to the studied sample refers to the participant's nationality. Here, 84% of the respondents are German. According to Silén et al. (2020), the western population tends to be more at risk for developing an eating disorder as other parts of the world's population are. Therefore, the mainly German sample of this study is not representative of the non-western population. This would, in turn, imply that this study's results regarding the average level of body dissatisfaction might be unrepresentative for other nationalities, like for example Asian regions. Therefore, another recommendation would be to distribute the survey on more international platforms to higher the non-western number of participants. In this case, social media sites like Facebook or Instagram can be used. Another possibility would be to contact potential partner

universities in non-western regions to share this survey in their environment, too.

Furthermore, due to ethical restrictions for undergraduate study designs, the sample does not contain participants below the age of 16 years. However, previous research in the field of social media usage concerning the individual's level of body dissatisfaction showed that women between 12 to 28 years are most at risk because of their generally higher usage time and their lower levels of self-esteem (Bert, Gualano, Camussi, & Siliquini, 2016; Gordon et al., 2020; Silén et al., 2020). Thus, this study's results for the hypothesized relationship between social media and body dissatisfaction might be different when including participants from the age of 12 years. Accordingly, it would be recommended to implement this study again with an already graduated researcher in the field of psychology. Thereby, ethical restrictions regarding the minimum age of participants can be omitted. However, participants, who are younger than 16 needs parental consent for such studies. This consent needs to be guaranteed by the graduated researcher to gain ethical approval.

Additionally, several variables were not included in the statistical analyses. The study asked for the women's social media usage as well as for their most-used application. Here, a list of different apps was given, like for example Snapchat, Facebook, Instagram or Whatsapp. When analyzing the gathered data, the differences between subjects on types of used social media were not included. However, research in this area showed the communication function, which is mainly embedded in Whatsapp, as positively related to self-esteem (Best, Manktelow, & Taylor, 2014). On the other hand, applications which focus on the physical appearance, like Instagram are thought to be negatively correlated with body dissatisfaction as well as with the women's level of self-esteem (Santarossa, & Woodruff, 2017). Therefore, this study's results can be analyzed for a second time with changing the focus a bit towards the differences between most-used social media applications. Here, the potential difference between appearance-related applications and communication-focused applications can be compared regarding their effect size on the individual's level of body-dissatisfaction.

Lastly, individuals' social media usage was measured by a so-called frequency recall. At the beginning of the online study, participants needed to answer the question "*How much time do you spend on social media per day?*". Here, they received the hint to have a look in their smartphone settings for their screen-time. However, not all smartphones can display this time. Besides this information regarding their time spent with social media goes not beyond the smartphone. Although, social media can also be used with other devices, such as a laptop or a smart-TV, too. Therefore, this study's results are limited to an extent, that it is unclear how valid the results regarding time spent on social media are. Hence, it is recommended to expand this study regarding time-related questions. Here, a question regarding used devices for social media can be added as

well as a question regarding time spent on each of these devices separately. Additionally, participants can be asked to keep track of their time spent on social media one week in advance to the study's completion. Thereby, their indicated time might be more accurate.

5.2 Conclusion

Summarizing, this study confirmed the hypothesized relationship between social media usage and the individual's level of body dissatisfaction. Higher social media usage is significantly related to higher levels of body dissatisfaction in women. This result is in line with previous research of Wilksch et al. from 2019. Parallelly, this study showed women's level of self-esteem as being a buffering moderator variable. In women with higher self-esteem, social media usage has a less serious effect as in women with low self-esteem. So, women's level of self-esteem has a protective function against feelings of body dissatisfaction.

Based on this, further research is recommended for being able to develop interventions for increasing women's level of self-esteem to protect them against the negative effects of social media usage.

However, this study had some limitations regarding the design and the sampling method. Therefore, it is recommended to change the cross-sectional design to the longitudinal study design for increasing the meaningfulness of resulting causality. Besides, the study should be enriched with questions regarding time-spent on social media. Therefore, participants should be prepared by saying them to keep track of their usage time one week in advance to the study. Thereby, the validity of the gathered results might be increased. Moreover, the used sample should be more international by including non-western nationalities, too. Here, it is further recommended to make sure that the sample's educational level is similar to the average population. Next, when performing such a study again, participants from the age of 12 years onwards should be included because the at-risk group ranges from 12 to 28 years (Bert, Gualano, Camussi, & Siliquini, 2016; Gordon et al., 2020; Silén et al., 2020). Lastly, the differences between most-used social media applications should be analyzed in greater detail. Here, previous studies showed that appearance-related applications differ regarding their effect on the women's level of body-dissatisfaction from applications, which are more focused on communication (Best, Manktelow, & Taylor, 2014; Santarossa, & Woodruff, 2017).

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7 Appendices

Appendix A: Body Shape Questionnaire (BSQ-34)

We should like to know how you have been feeling about your appearance over the **PAST FOUR WEEKS**. Please read each question and circle the appropriate number to the right. Please answer all the questions.

OVER THE PAST FOUR WEEKS:

	Never	Rarely	Sometimes	Often	Very often	Always
1. Has feeling bored made you brood about your shape?.....	1	2	3	4	5	6
2. Have you been so worried about your shape that you have been feeling you ought to diet?.....	1	2	3	4	5	6
3. Have you thought that your thighs, hips or bottom are too large for the rest of you?.....	1	2	3	4	5	6

4.	Have you been afraid that you might become fat (or fatter)?.....	1	2	3	4	5	6
5.	Have you worried about your flesh being not firm enough?.....	1	2	3	4	5	6
6.	Has feeling full (e.g. after eating a large meal) made you feel fat?.....	1	2	3	4	5	6
7.	Have you felt so bad about your shape that you have cried?.....	1	2	3	4	5	6
8.	Have you avoided running because your flesh might wobble?.....	1	2	3	4	5	6
9.	Has being with thin women made you feel self-conscious about your shape?.....	1	2	3	4	5	6
10.	Have you worried about your thighs spreading out when sitting down?	1	2	3	4	5	6
11.	Has eating even a small amount of food made you feel fat?.....	1	2	3	4	5	6
12.	Have you noticed the shape of other women and felt that your own shape compared unfavourably?.....	1	2	3	4	5	6
13.	Has thinking about your shape interfered with your ability to concentrate (e.g. while watching television, reading, listening	1	2	3	4	5	6

to conversations)?.....

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14.	Has being naked, such as when taking a bath, made you feel fat?.....	1	2	3	4	5	6
15.	Have you avoided wearing clothes which make you particularly aware of the shape of your body?.....	1	2	3	4	5	6
16.	Have you imagined cutting off fleshy areas of your body?.....	1	2	3	4	5	6

17.	Has eating sweets, cakes, or other high-calorie food made you feel fat?	1	2	3	4	5	6
18.	Have you not gone out to social occasions (e.g. parties) because you have felt bad about your shape?.....	1	2	3	4	5	6
19.	Have you felt excessively large and rounded?.....	1	2	3	4	5	6
20.	Have you felt ashamed of your body?.....	1	2	3	4	5	6
21.	Has worry about your shape made you diet?.....	1	2	3	4	5	6
22.	Have you felt happiest about your shape when your stomach has been empty (e.g. in the morning)?.....	1	2	3	4	5	6
23.	Have you thought that you are in the shape you are because you lack self-control?.....	1	2	3	4	5	6
24.	Have you worried about other people seeing rolls of fat around your waist or stomach?.....	1	2	3	4	5	6
25.	Have you felt that it is not fair that other women are thinner than you?.	1	2	3	4	5	6

26.	Have you vomited in order to feel thinner?.....	1	2	3	4	5	6
27.	When in company have your worried about taking up too much room (e.g. sitting on a sofa, or a bus seat)?.....	1	2	3	4	5	6
28.	Have you worried about your flesh being dimply?.....	1	2	3	4	5	6
29.	Has seeing your reflection (e.g. in a mirror or shop window) made you feel bad about your shape?.....	1	2	3	4	5	6
30.	Have you pinched areas of your body to see how much fat there is?.....	1	2	3	4	5	6
31.	Have you avoided situations where people could see your body (e.g. communal changing rooms or swimming baths)?.....	1	2	3	4	5	6
32.	Have you taken laxatives in order to feel thinner?.....	1	2	3	4	5	6
33.	Have you been particularly self-conscious about your shape when in the company of other people?.....	1	2	3	4	5	6
34.	Has worry about your shape made you feel you ought to exercise?.....	1	2	3	4	5	6

Appendix B: Rosenberg's Self-esteem Scale

STATEMENT	Strongly Agree	Agree	Disagree	Strongly Disagree
1. I feel that I am a person of worth, at least on an equal plane with others.				
2. I feel that I have a number of good qualities…				
3. All in all, I am inclined to feel that I am a failure.				
4. I am able to do things as well as most other people.				
5. I feel I do not have much to be proud of.				
6. I take a positive attitude toward myself.				
7. On the whole, I am satisfied with myself.				
8. I wish I could have more respect for myself.				
9. I certainly feel useless at times.				
10. At times I think I am no good at all.				

Your score on the Rosenberg self-esteem scale is:

Scores are calculated as follows:

- *For items 1, 2, 4, 6,* and *7:*

Strongly agree = 3
Agree = 2
Disagree = 1
Strongly disagree = 0

- *For items 3, 5, 8, 9,* and *10* (which are reversed in valence):

Strongly agree = 0
Agree = 1
Disagree = 2
Strongly disagree = 3

The scale ranges from 0-30. Scores between 15 and 25 are within normal range; scores below 15 suggest low self-esteem.

Appendix C: Questions regarding social media usage

1. How much time do you spend on social media per day (e.g. Instagram, Snapchat, Facebook, WhatsApp, Twitter, ...)? Some smartphones can display that time within the settings; try to have a look at it.

2. Which social media app is the most time consuming one? Choose one and enter the average time for this app only.

3. For what reason are you using these apps? Multiple answers are possible.

Appendix D: Informed consent

Dear participant,

Welcome to the survey about your social media usage concerning your level of body dissatisfaction as well as your level of self-esteem. The survey will take approximately 15 minutes.

By participating in this survey you will contribute to the development of scientific knowledge. We will investigate your experiences with social media concerning your level of body dissatisfaction. This will give us insight into a potential relationship between social media and mental health because the level of body dissatisfaction is hypothesized to predict the emergence of eating disorders.

The data will be used to analyze this relationship with an additional focus on the level of self-esteem as a potential mediator between both concepts. Your answers will remain anonymous. The results will be analyzed on a group level.

If you would like to stop participating, you can stop any time you like to. When you do so, your answers will not be used for the research and will be erased.

If you have any questions or comments concerning the research you can report this at the end of the research or email the responsible researcher (j.l.averdung@student.utwente.nl). For complaints about this research, please contact the secretary of the Ethics Committee of the Faculty of Behavioural, Management and Social Sciences at the University of Twente (Drs. L. Kamphuis-Blikman, +31 (0) 53 489 3399; l.j.m.blikman@utwente.nl).

Thank you for your participation,

Jasmin Averdung

By clicking the "Yes" option you indicate that you have read and understood the above consent form and that you would like to participate out of your own free will.

Appendix E: Debriefing form

This study is concerned with the relationship between social media usage and the level of body dissatisfaction, where self-esteem is thought to mediate that relationship. Previous studies in this area are of mixed results but the usage of social media apps is rising and will increase further in the next few years. Therefore, this research is needed to get a clearer picture of the relationship to body dissatisfaction. Here, body dissatisfaction is hypothesized to predict the emergence of eating disorders.

How was this tested?

In this study, you were asked to fill out three questions regarding your social media usage and two questionnaires (the Body Shape Questionnaire and the Rosenberg's self-esteem scale). All participants got the same questions.

Hypotheses and main questions:

It is expected that a high level of social media usage along with a low level of self-esteem will increase the individual's level of body dissatisfaction. This will, in turn, higher the risk for the emergence of an eating disorder in that specific individual. Contrary, a high level of self-esteem is expected to decrease social media's adverse effects. It will protect the individual against an increased level of body dissatisfaction, wherefore the risk of developing an eating disorder will be lower.

Why is this important to study?

The level of body dissatisfaction is an important risk factor for the development of an eating disorder. The prevalence rate of eating disorders increased in the last years and is hypothesized to increase even further. Parallelly, social media usage also increased and will rise further in the next few years. Here, it is important to understand a potential relationship with the level of self-esteem for being able to protect individuals against the negative effects of social media usage and for being able to lower the prevalence of mental health problems, like eating disorders.

What if I want to know more?

If you are interested in learning more about the relation between social media, body dissatisfaction and self-esteem, feel free to contact me (j.l.averdung@student.utwente.nl)

If you would like to receive a report of this research when it is completed (or a summary of the findings), please contact (Jasmin Averdung) at (j.l.averdung@student.utwente.nl).

Thank you again for your participation.