

**Fit for Well-being: The Role of Regular Physical Activity as a Positive Moderator
between Social Media Fitness Content Consumption and Mental Well-Being**

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ABSTRACT

This study examined the role of regular physical activity as a positive moderator between social media fitness content consumption and mental well-being while controlling for the effect of physical appearance comparison. To investigate the key variables the WHO-5 Well-Being Index, the Facebook Intensity (FBI-Scale), the Physical Appearance Comparison Scale-3 (PACS-3), and the International Physical Activity Questionnaire - Short Form were selected. Participants for the explorative quantitative cross-sectional survey study were selected via convenience sampling and consisted of 83 participants between the ages of 17 to 28 years old. The hypothesis was accepted, finding a p-value of $p = .028$. Therefore, the moderation effect of regular physical activity in enhancing mental well-being for those engaged in higher physical activity and fitness content consumption shows a promising avenue for promoting mental health among young adults, also while taking the variable of physical appearance comparison on social media into account. Theoretical and practical implications were discussed.

Keywords: Social Media, Mental Well-Being, Physical Activity, Physical Appearance Comparison, Fitness Content Consumption, Generation Z, Cross-Sectional Survey Study

(During the preparation of this work, I used ChatGPT to simplify the work with R Studio. and for brainstorming ideas. Furthermore, I used the text processors Grammarly and Word to check for grammar and spelling. Lastly, I used Scribbr to check for plagiarism. After using these tools, I thoroughly reviewed and edited the content as needed, taking full responsibility for the outcome.)

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Fit for Well-being: The Role of Regular Physical Activity as a Positive Moderator between Social Media Fitness Content Consumption and Mental Well-Being

Since the advent of widely used social media platforms in the mid-2000s, there has been a transformation in global communication and information-sharing patterns. Over the last decade, the pervasive influence of social media has been evidenced by the exponential growth in user numbers, the emergence of new communication norms, and its impact on various aspects of society. Of 7.7 billion people who lived in 2019, 3.5 billion of them were connected to the internet in some way. Facebook alone, the biggest social media platform in 2019, had more than 2.4 billion users (Ospina & Roser, 2023). The data shows that at least around 33% of people living in 2019 were already engaged in social media activity (Ospina & Roser, 2023). However, research has shown that increased social media use is related to lower well-being and dissatisfaction with the own appearance (Orben et al., 2019).

The world of social media has changed dramatically in the last few years, especially for adolescents and younger adults. For instance, a survey from the Pew Research Centre with 1.316 U.S. teens, has shown that social media use from 2015 to 2022 has shifted dramatically from Facebook as the most used platform in 2015, to YouTube as the most used social media platform with 95% of the teenagers using it, followed by TikTok with 67%, Instagram with 62% and Snapchat with 59% (Vogels et al., 2022).

Different studies show that social media platforms that have a stronger focus on images and videos like Instagram, Snapchat, or TikTok, have the strongest impact on body image and these types of social media platforms also seem to be the most relevant platforms related to fitness content consumption (Vandenbosch et al., 2022). Additionally, an Australian study from 2017 showed that around three hours per day from adolescents were

spent on social media (Mingoia, 2017). This great amount of time that was and is spent on social media certainly had and has an impact on the development of human society on a global scale.

Psychological research focusing on social media and mental well-being has established that different factors contribute to understanding the relationship between social media and mental well-being. However, there is conflicting evidence regarding the effect of social media consumption on well-being and the effect is also dependent on the content which is consumed. To enlighten parts of the existing body of research, this thesis aims to identify and evaluate the effect of regular physical activity on the relationship between social media and mental well-being, while taking physical appearance comparison into account.

Insights in the field of social media and mental well-being could be important for the understanding and treatment of negative impacts from social media use on mental well-being, within the highly dynamic field of rapid growth and change of social media platforms. This chapter will introduce the thesis by starting with explaining the concepts of mental well-being, social media, regular physical activity, and physical appearance comparison, followed by the target group and an overview of the current study.

Mental well-being

Taking a closer look, mental well-being is a complex construct. Therefore, a precise definition is needed and could be stated in the following way: ‘Well-being can be understood as how people feel and how they function, both on a personal and a social level, and how they evaluate their lives as a whole.’ (Mental Health Foundation, 2015).

According to Seligman (2011), five elements should be considered when measuring the construct of mental well-being. Those are positive emotion, engagement, relationships, meaning, and accomplishment all contributing to the experience of well-being (Seligman, 2011). In detail, Seligman (2011) defines positive emotion can be understood as the

experience of feelings like joy, gratitude, and commitment. Additionally, engagement describes the state of complete immersion in an activity, in the sense of being present while doing something and not getting distracted. Next, relationships can be understood as positive and meaningful connections or social interactions with other individuals. Lastly, meaning or purpose in life involves understanding one's values, goals, and life direction, and the concept of accomplishment is understood as the setting and achieving of specific goals in life. The different concepts collectively contribute to mental well-being (Seligman, 2011).

Multiple studies including for example long-term prospective studies and experimental intervention studies were conducted, concluding that high mental well-being is associated with longevity and enhanced health throughout life (Diener & Chan, 2011). Expanding beyond these findings, the impact of mental well-being extends to different domains of modern life, notably within the domain of social media.

Social media

Social media can be defined as follows: “Social media 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). Especially, fitness content that is designed to inspire people is often shared on social media and includes images, videos, or text.

Fitness content consumption is defined as the engagement with fitness-related pictures, videos, or textual content on social media platforms. Users may come across fitness content by chance during their regular social media use, follow certain fitness content creators, or get fitness content recommendations via social media platform algorithms. However, concerns have arisen due to the focus on weight loss and a prevalence of thin- and

muscular-idealizing imagery, that consumption of fitness content could lead to lower well-being (Stollfuß, 2020).

The time spent engaging with fitness content on social media can promote healthy or unhealthy ideals and therefore alter the mental well-being and behaviour of users. This means that fitness content consumption could also lead to a positive impact on mental well-being, through the facilitation of regular physical activity. Representing social media, the variable fitness content consumption will be the main focus in this study. In conclusion, it seems to be important to consider different contributing factors then investigating the relationship between mental well-being and social media.

The relation between mental well-being & social media

To understand the achievement of mental well-being within the context of social media different theories are of interest. For instance, the Uses and Gratification Theory states that people use media to fulfil their needs and to achieve a feeling of gratification (Katz et al., 1974). A study conducted by Ozkaya & LaRose (2014) concluded that networking within social media platforms can lead to enhanced life satisfaction, by fulfilling the need for belongingness (Ozkaya & LaRose, 2014). Furthermore, positive emotion can also be achieved through social networks and may occur more often than negative emotion while using social networks (Ferrara & Yang, 2015). Additionally, the distribution of values within social media could also help to achieve a sense of meaning in life (Seligman, 2011). They are suggesting that the way information, content, or values are shared within social media might help individuals find meaning in life. Different studies have explored the potential benefits of social media, including fostering social support, facilitating self-expression, and promoting well-being through positive content sharing. For example, a study from South Korea showed that the social network size of participants was associated with higher scores on reported well-being (Lee et al., 2011).

In contrast to that, there is also important literature on the negative effects of social media that should be considered within the research of the thesis. For instance, high screen time of individuals can be linked to higher social media use and is associated with mental well-being problems. These well-being problems can be anxiety, depression, loneliness, or low self-esteem (Twenge & Campbell, 2018). Additionally, while social media use can foster the feeling of belonging there are contradictory findings in research. For example, a study showed that increased social media use is directly linked to higher feelings of loneliness (Primack et al., 2017).

Considering the partly contradicting mentioned research, it seems logical to investigate variables that could have an important impact on the relationship between mental well-being and social media. Therefore, moving beyond the relationship between mental well-being and social media, the investigation of the thesis delves into the variables of regular physical activity and its connection with mental well-being, especially for fitness content consumption on social media.

Regular physical activity and physical appearance comparison

Regular physical activity for health outcomes can be defined as completion, attendance, duration, and intensity adherence to physical activity (Hawley-Hague, 2016). Completion is achieved when individuals are attending the training sessions on a regular base. Non-completion includes withdrawal from the training. Attendance can be described as: “percentage of classes attended out of the actual number of sessions offered” and duration as “adherence to predefined minutes, for example, 30 min, three times a week.”. Intensity is related to the “intensity of exercise” and “may differ depending on the type of program” (Hawley-Hague, 2016). The role of regular exercise has been linked several times with increased mental well-being (Edward, 2006). For instance, a cross-sectional study from

Finland has shown that individuals who engage in regular physical activity displayed significantly better mental well-being (Hassmen et al., 2000).

There are some key theories and pieces of research that investigate the relationship between social media and well-being. First, the Social Comparison Theory developed by Leon Festinger, suggests that individuals have a natural tendency to compare themselves to others, especially those they perceive as similar (Festinger, 1957). Multiple studies on the relationship between social media and social comparison have shown that there is a significant correlation between time spent on social media and well-being. For instance, the study from Kim (2022) about the social comparison of fitness social media postings by fitness app users has shown that the self-efficacy beliefs of participants worked as a moderator for motivation related to training. In this study, participants were challenged to share and compare their sports activity through a social media channel to each other. A positive correlation between content consumption and physical activity was found for participants with high self-efficacy beliefs. Additionally, a study from Fox (1999) suggests that higher regular activity is associated with higher mental well-being. Inferring, that social comparison could lead to higher regular activity, which is associated with higher mental well-being, fitness content consumption could be able to indirectly elevate mental well-being. In contrast, there are also different findings for the correlation between fitness content consumption and mental well-being. A lot of subjective well-being issues accelerated by social media might stem from physical appearance comparison issues. Physical appearance comparison can be defined as the comparison of body shape and overall physical attractiveness from others with their appearance, it therefore is a part aspect of social comparison (Jones, 2002). For instance, research from (Jarman et al., 2021) shows that social media intensity and appearance-based social media use can lead to beauty standards that praise thin and muscular bodies that are mostly not achievable for the average individual.

Thus, comparison with these standards will lead to lower body satisfaction and well-being of the individual, according to the research from Jarman et al., 2021. This is underlined by Bandura's Self-Efficacy Theory, which argues that the belief of individuals about being able to achieve beauty standards will alter the subjective perceived well-being of subjects (Bandura, 1999).

Social comparison and physical appearance comparison seems to be able to work as facilitators or inhibitors for positive health behaviour, depending on the perspective of the individual perceiving the content. For instance, an individual perceiving his ideal image as achievable could therefore lead to higher physical activity and therefore better mental well-being. Conversely, the cognitive dissonance stemming from the mismatch between an individual's regular physical activity and the low self-efficacy beliefs gained through social media can potentially induce behavioural modifications or alter their self-efficacy beliefs. For the case of low self-efficacy beliefs, this might lead individuals to either discontinue training or foster the belief that they can attain the perceived standards (Harmon-Jones & Mills, 2019). Considering the nuanced impact of regular physical activity, and social and physical appearance comparisons on individuals' mental well-being, it is important to consider a fitting target group for the research.

Target group

Due to the time overlap from the social media rising with the development of Generation Z, Generation Z seems to be the most influenced once. For instance, data found by Stahl & Literat (2023) shows that Generation Z exceeds Generation Y in time spent on social media per day, with nearly 3 hours a day, leading to lower well-being and higher dissatisfaction with their appearance (Orben et al., 2019).

Some additional research suggests that there is high pressure among adolescents to be part of the ingroup (Nesi et al., 2018). For example, the perceived opinion of others on social media

platforms is highly important for individuals leading to a higher prevalence of social comparison within Generation Z, increased pressure to conform could therefore lead to lower subjective well-being (Zhang et al., 2016). Especially, fitness content consumption could have a strong influence on these individuals, by triggering physical appearance comparisons between individuals (Jarman et al., 2021). Therefore, the target group will focus on individuals from Generation Z, born in the years between 1995 to 2010.

The present study

There are still topics within the research field of social media and mental well-being that have not been investigated yet. For instance, although the effect of physical appearance comparison is treated with attention, there is still a lack of research investigating the effect of social media fitness content consumption on mental well-being, while taking regular exercise as a moderator into account and controlling for physical appearance comparison. For example, the study of Jarman et al. (2021) did not consider whether individuals were exercising regularly or not. Additionally, the study by Kim (2022), which examined social comparison of fitness social media postings by social media users only examined the effect of social media on motivation and physical activity, not on mental well-being.

Although the existing body of research is well established with studies related to individuals who struggle with mental well-being issues or the effects of social media use and social comparison within social media, there is still research that could get added to the existing body of research, especially for high consumption of fitness content and the effect of regular physical activity on it. Individuals using social media, therefore would find themselves well-equipped in terms of possible coping mechanisms to achieve higher mental well-being in the case of high social media usage that exposes individuals to fitness-related content.

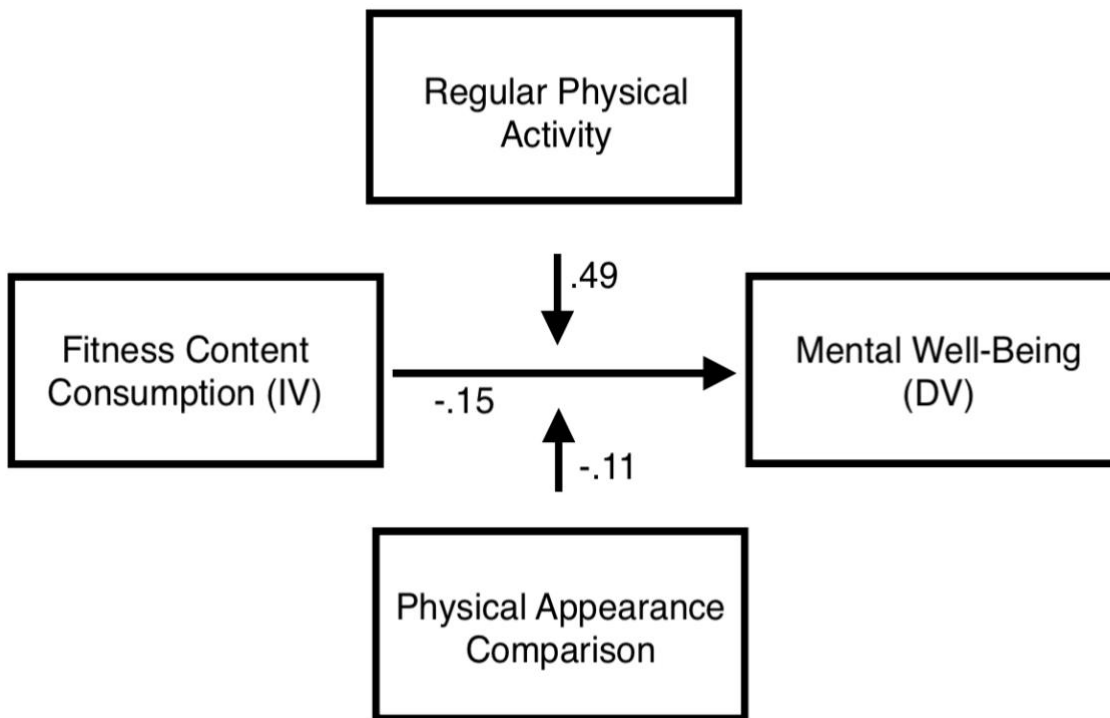
This study will aim to identify and evaluate the variable of regular physical activity on the relationship between social media fitness content consumption and mental well-being while controlling for the variable of physical appearance comparison within social media. The following research question was central: “To what extent does regular physical activity influence the relationship between time spent on social media and mental well-being among individuals from Generation Z (born in the years between 1995 and 2010) who frequently consume fitness-related content on social media, while considering the role of physical appearance comparison?”. Based on this, the following hypothesis is derived:

- Hypothesis: “Regular Physical Activity” positively moderates the relation between mental well-being and social media usage, especially for the consumption of fitness-related content on TikTok and Instagram, while controlling for the role of physical appearance comparison.

A schematic representation of the study design can be found in Figure 1.

Figure 1

The relationship between Fitness Content Consumption (IV) and Mental Well-Being (DV), with Regular Physical Activity as a moderating variable, while controlling for Physical

Appearance Comparison.

This study will contribute to the body of knowledge on tools to improve mental well-being among individuals who use social media through engaging fitness content consumption by surfacing and evaluating the moderator variable “Regular Physical Activity” within the relationship between social media usage and mental well-being, especially concerning fitness content consumption on social media platforms like TikTok and Instagram, while controlling for the aspect of physical appearance comparison. This will help add to the current body of research in this area and could provide value to individuals who consume social media fitness content and want to achieve a higher mental well-being.

Methods

To investigate the key variables and key variable types of the research question related to mental well-being and social media fitness content consumption, physical appearance comparison, and regular physical activity, different self-report questionnaires

were selected, adapted, and combined. Namely, the WHO-5 Well-Being Index, the Facebook Intensity (FBI-Scale), the Physical Appearance Comparison Scale–3 (PACS-3), which are quantitative variables, and the International Physical Activity Questionnaire - Short Form, which is a categorical variable. All quantitative variables results were calculated and standardised in percentage, without influencing the significance of the normal calculation formulas. This standardization process involves transforming the original values of each variable into a percentage scale based on their distribution characteristics.

This study was approved by the Ethics Committee of the Faculty of Behavioural, Management, and Social Sciences (BMS) of the University of Twente with the ID number 231287.

Participants

The number of participants for the quantitative self-report questionnaire was 83, of which 53 were female, 23 were male, 3 non-binary and 4 did not provide their gender. The subjects' ages varied from 17 to 28 years old. Participants were recruited via convenience sampling based on the researcher's network and SONA System. Sona is an online system that facilitates psychology experiments and registrations and is used to fulfill the research requirement for projects. To participate, the subjects needed to be at least 16 years of age and participants needed to be able to sufficiently read and understand English to participate in the questionnaires. Participants need to be willing to complete the participation and provide information on their social media usage, exercise habits, and mental well-being. Participants who report that they are particularly vulnerable or at risk will be excluded. Participation is voluntary and consent is given before participation.

Table 1
Frequency Table for Age, Gender, and Nationality

Characteristic	Full sample	
	<i>n</i>	%
Gender		

Female	53	63.9
Male	23	27.7
Non-binary	3	3.6
Other	4	4.8
Age		
18-19	20	24.1
20-21	22	26.5
22-23	22	26.5
Other	17	20.5
Nationality		
German	37	44.6
Dutch	30	36.1
Other	16	19.3

Note. N=83

Procedure

The questions were developed and distributed at the website ‘Qualtrics’ and participants answered the questions of the adopted and combined self-report questionnaire via Qualtrics. The questionnaire also included basic demographic information, consent, and debriefing. The collected data outcome is quantitative and serves as a foundation for testing the hypothesis and research question. Participants received a participation invitation through personal contact with the researcher or were recruited via the SONA System. Before conducting the self-report online questionnaire, participants were presented with the informed consent form, including information about the purpose and duration of the study. The duration was stated as approximately 20 minutes. They were also informed about any possible risks, the ability to withdraw at any given time, and the contact information of the researchers. To give consent, participants had to select the statement whereby they confirmed to be 16 years or older and stated that they had read and understood the information.

After giving informed consent, participants first filled in the demographic information. Then, they answered multiple questions related to the adopted Well-Being Index (WHO-5), the adapted Facebook Intensity (FBI-Scale), the adapted Physical Appearance Comparison Scale–3 (PACS-3), and the adopted International Physical Activity

Questionnaire - Short Form (IPAQ). After participating, participants were thanked for their participation and informed that their responses had been recorded. A possibility to provide concerns or comments about the questionnaire to the researcher was provided. If applicable, students were granted 0.25 SONA credits for participating in the study. The program Qualtrics is used for the procedure and participants data will be stored for a maximum of ten years.

Materials

For the quantitative research, namely the self-report questionnaire, an electric device such as our laptop or cell phone was used to gather the data of the participants. The online platform Qualtrics is an Experience Management (XM) software and was used to display the self-report questionnaire to the participants. For the data analysis of the gathered data, the statistics program R-studio was used to work with the raw data set.

Mental well-being

To measure mental well-being, the adapted Well-Being Index with five items was used (WHO-5). The adapted WHO-5 consists of the original five statements of which the participants had to choose on what level they agreed with the statements. For instance, the statement 'I have felt cheerful and in good spirits in the last seven days' was presented to the participants. A 5-point Likert scale ranging from *completely agree* to *completely disagree* was provided as answer possibility, this was an adaption to the original WHO-5 which normally consists of six answer categories ranging from 0 to 5. The minimum score of the adapted WHO-5 was 0, with a maximum score of 100. The score represented the level of mental well-being: the higher the score, the higher the mental well-being. (Topp et al., 2015). For the WHO-5, scores between 0 and 25 indicate low mental well-being, scores between 26 and 50 indicate moderate mental well-being, scores between 51 and 75 indicate high mental well-being, and, lastly, scores between 76 and 100 represent very high mental well-being

(Bech et al., 2003). Research by Topp et al. (2015) showed good validity and reliability of the scale, finding a Cronbach's alpha of 0.89 and a sensitivity of 89% for the identification of mild to severe depressive affect.

Fitness content consumption

For measuring fitness content consumption, the adapted Facebook Intensity (FBI-Scale) was provided. Adaptions were made regarding measuring the Instagram and TikTok fitness content consumption of participants and there necessary for correct data gathering that fits the research question of the study. The adapted FBI-Scale consists of 10 statements. With 8 of the statements, participants had to choose on what level they agreed with the statements. For instance, the statement 'Watching Instagram fitness content is part of my everyday activity' was presented to the participants. A 5-point Likert scale ranging from *completely agree* to *completely disagree* was provided as an answer possibility. In the other 2 statements, participants had to indicate the time they spent a day watching fitness content. For example, the statement 'In the past week, on average, approximately how much time PER DAY have you spent actively watching Instagram fitness content?' was presented. The minimum score of the adapted FBI-Scale was 0, with a maximum score of 100. The score represented the level of fitness content consumption: the higher the score, the higher the fitness content consumption. Adoption was made by changing the referred social media platform Facebook to fitness content consumption on Instagram and TikTok. Additionally, items 4,6,7 of the original scale were excluded, because they were not in line with the chosen theme of fitness content consumption on social media.

Research from Ellison et al. (2007) showed that the FBI-Scale was a valid measurement scale to measure the intensity of Facebook use. Reliability analysis showed that the WHO-5 had a high level of internal consistency ($\alpha=.82$).

Physical appearance comparison

For measuring physical appearance comparison, the Physical Appearance Comparison Scale-3 (PACS-3) was adopted. The adapted PACS-3 consists of 6 statements. On the 6 statements, participants had to choose on what level they agreed with the statements. For example, the statement ‘When I watch Instagram fitness content, I compare my muscularity to the muscularity of the actors/actresses.’ was presented to the participants. A 5-point Likert scale ranging from *completely agree* to *completely disagree* was provided as an answer possibility. The minimum score of the adapted PACS-3 was 0, with a maximum score of 100. The score represented the level of physical appearance comparison on Instagram and TikTok: the higher the score, the higher the physical appearance comparison of the participants. Adoption was made by only referring to fitness content consumption on Instagram and TikTok within the statements. Research from Schaefer & Thompson (2018). showed that the FBI-Scale was a valid and reliable measurement scale to measure the physical appearance comparison.

Regular physical activity

Lastly, to measure regular physical activity, the International Physical Activity Questionnaire - Short Form (IPAQ) was adapted and added to the survey. The adapted IPAQ consists of 8 statements, instead of 7. The respondents were asked to answer the first 7 questions about their physical activity during the past week of the original IPAQ and 1 extra question about the representativeness of the described past week. An example of a question of the IPAQ is: ‘During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?’. The answer possibilities were open and participants had to insert numbers representing minutes, hours, or days—the scores were calculated by multiplication of MET value, minutes of activity, and days per week. For instance, moderate activities have a MET value of around 3.3, while vigorous activities have a MET value of around 6.0. A MET-score of 3000 displays a high level of

activity, while a MET-score between 1200 and 3000 is associated with a moderate level of activity, and a MET-score lower than 1200 is defined with a low level of activity. The IPAQ shows good validity and reliability (Craig et al. 2003).

Data analysis

The gathered data was analysed with R Studio. In the data analysis preparation, the complete data was cleared from all responses that had missing data in it. After excluding all missing cases 83 cases were left. Next, all columns with unnecessary data were excluded from the dataset. Unnecessary data was defined as data that was not needed to answer the research question. For instance, the IP address of the device that was used for the participation of the questionnaire was excluded. The remaining columns in the data list include "Consent," "Age," "Gender," "Nationality," "WHO-5 (Que 1-5)," "FBI-Scale (Question 1-9)," "PACS-3 (Question 1-6)," and "IPAQ (Question 1-8)," while each question and demographic had his column. The criteria used for excluding missing data within the remaining columns in the data list was that if one or more answers of a participant were non-identifiable or missing, the participant was excluded from the analysis. Some identifiable values had to be changed individually due to misunderstandings among participants within the participation process. For example, mistakes with the use of correct time units were engaged by transforming hours into minutes. Additionally, all Likert scale responses were translated to numbers ranging from 1 (Fully disagree) to 5 (Fully agree) and variables were changed from characters to numeric. First, descriptive statistics were conducted to gain insight into the data of demographics and measurement scales, which provided information on the variable's social media fitness content consumption, mental well-being, regular physical activity, and physical appearance comparison. Next, correlation analysis was executed, followed by inferential statistics. Beforehand, the questionnaire scores of the

WHO-5, FBI-Scale, and PACS-3 were calculated, standardized, and combined into one variable each. The IPAQ was calculated and combined into three categories due to the categorical nature of the result. By grouping the scores into three categories, a clearer understanding of the participant's physical activity levels is achieved, making the information more accessible for analysis and interpretation. The correlation analysis was used to test for possible positive or negative correlations between the variables. Furthermore, the inferential statistics were used with a significance level of $\alpha=.05$. Here a multiple regression analysis was conducted to test if the variable "Regular Physical Activity" positively moderates the relation between mental well-being and social media usage, especially for the consumption of fitness related content on TikTok and Instagram, while controlling for the role of physical appearance comparison. For the regression analysis, the assumptions of homoscedasticity, normality, and linearity were estimated and fulfilled. To control for the assumptions of homoscedasticity the residuals were plotted against the predicted values. To check for normality a histogram was plotted and inspected for normal distribution. Furthermore, the observed values were plotted against the predicted values to check for linearity. Next, an interaction plot was applied to visualize the moderation effect. The results provided by descriptive statistics and inferential statistics were used to answer the research question: "To what extent does regular physical activity influence the relationship between time spent on social media and mental well-being among individuals from Generation Z (born in the years between 1995 and 2010) who frequently consume fitness-related content on social media while considering the role of physical appearance comparison?".

Results

Descriptives

First, descriptive analyses were conducted to display the outcomes of the participants on the variables of Mental Well-Being, Fitness Content Consumption, Physical Appearance Comparison, and Regular Physical Activity. The outcomes of the variables Mental Well-Being, Fitness Content Consumption, and Physical Appearance Comparison are shown in Table 2. When analysing the data of the variable Mental Well-Being, it is displayed that the participants had a high level of mental well-being on average ($M = 59.04$, $SD = 23.62$). The results of the variable Fitness Content Consumption show the average scores of the participants with a moderate value ($M = 38.05$, $SD = 26.45$), which means that the average participant is moderately engaged with the consumption of fitness content on Instagram and TikTok. Looking at the outcomes of the variable Physical Appearance Comparison, it can be stated that the participants scored moderate on average ($M = 54.27$, $SD = 24.21$), which means that the average participant is moderately engaged in physical appearance comparison on social media.

Table 2

Descriptives of the variables Mental Well-Being (WHO-5), Fitness Content Consumption (FBI-Scale), and Physical Appearance Comparison (PACS-3) standardized in 1:100.

Variable	<i>M</i>	<i>SD</i>
Mental Well-Being	59.04	23.62
Fitness Content Consumption	38.05	26.45
Physical Appearance Comparison	54.27	24.21

Note. N=83

The descriptive analysis of the Regular Physical Activity (IPAQ) is shown in Table 3. The results of the variable Regular Physical Activity are displayed in three different

categories based on the calculated total MET. A MET score of 3000 and above is associated with a high level of activity. A MET score between 1200 and 3000 is associated with a moderate level of activity. A MET score lower than 1200 is associated with a low level of activity. 30 of 83 participants display a high level of activity, 28 of 83 participants display a moderate level of activity and. 25 of 83 participants display a low level of activity.

Table 3

Descriptives of the variable the Regular Physical Activity (IPAQ).

Variable Categories	<i>n</i>
High level of activity	30
Moderate level of activity	28
Low level of activity	25

Note. N=83

Correlations

Well-being displayed a not significant moderate positive association with Fitness Content Consumption ($r = .21, p > .05$) and a significant positive association with Regular Training ($r = .25, p < .05$). Next, Fitness Content Consumption displayed a significant weak positive correlation with Physical Appearance Comparison ($r = .22, p < .05$). However, the correlation between Fitness Content Consumption and Regular Training is displayed slightly weaker and not significant ($r = .17, p > .05$). Notably, Physical Appearance Comparison and Regular Training revealed a weak and statistically insignificant positive correlation ($r = .08, p > .05$). In Table 4 the Pearson's correlation of the variables is displayed.

Table 4

Pearson's Correlation of Variables

Variable	1	2	3	4
1. Mental Well-being	1	.21	-.08	.25*
2. Fitness Content Consumption	.21	1	.22*	.17
3. Physical Appearance Comparison	-.08	.22*	1	.08
4. Regular Training	.25*	.17	.08	1

*. Correlation is significant at the 0.05 level (2-tailed).

Inferential analyses

Table 5 shows the results of the regression analysis with Regular Training (categorised in HIGH, MODERATE, and LOW as reference level), Fitness Content Consumption, and Physical Appearance Comparison as independent variables and mental well-being as the dependent variable. It is controlled for the variable Physical Appearance Comparison and the variable Fitness Content Consumption is the moderator. Moreover, the positive interaction effect of Regular Training and Fitness Content Consumption is displayed.

Both coefficients of Regular Training show a positive correlation but are not statistically significant. With a Moderate Activity Level of $\beta = 14.27$, $t(76) = 1.52$, $p > .05$ and a High Activity Level: $\beta = 5.55$, $t(76) = .56$, $p > .05$. This implies that, despite the positive relationship between Regular Training and the dependent variable, the observed effects may be due to chance variations, and the results should be interpreted with caution.

Neither of the variables Fitness Content Consumption & Physical Appearance Comparison significantly predicts Mental Well-being. Fitness Content Consumption: $\beta = -.15$, $t = -.92$, $p > .05$ and Physical Appearance Comparison: $\beta = -.11$, $t(76) = -1.19$, $p > .05$. These findings suggest that there is insufficient evidence to conclude that variations in Fitness Content Consumption or Physical Appearance Comparison are associated with significant changes in Mental Well-being.

The interaction effect of Moderate Activity Levels with Fitness Content Consumption shows a positive correlation, the effect is not statistically significant. MODERATE Activity Level * Fitness Content Consumption: $\beta = .29$, $t(76) = 1.3$, $p > .05$. This means that the observed positive correlation seems to be due to random variability. There is not enough evidence to conclude that the interaction effect is reliably associated with changes in the outcome variable. In contrast, there is a significant interaction effect of High Activity Levels with Fitness Content Consumption which shows a positive correlation, and the effect is statistically significant. The variables HIGH Activity Level and Fitness Content Consumption display the moderation of $\beta = .49$, $t(76) = 2.24$, $p < .05$. This result supports the hypothesis of the thesis, indicating that the combined influence of HIGH Activity Level and Fitness Content Consumption has a significant impact on the outcome variable. Lastly, the adjusted R-squared value of the moderated multiple regression analysis of .25 shows a moderate correlation and means that 25% of the variance in mental well-being has been accounted for, $R^2 = .25$, $F(6,76) = 5.55$, $p < .05$. Both values display results that can support the hypothesis of the research paper, suggesting that the combination of the examined variables, including the moderation effects, contributes significantly to explaining and understanding the variance in mental well-being as outlined in the research hypothesis.

Table 5
Moderated Multiple Regression Analysis.

Variable	B	SE	t	p	95% CI
Activity Level: MODERATE	14.27	9.36	1.52	0.132	[-4.3, 32.9]
Activity Level: HIGH	5.55	9.93	0.56	0.578	[-14.1, 25.2]
Fitness Content Consumption	-0.15	0.17	-0.92	0.361	[-0.5, 0.2]
Physical Appearance					
Comparison	-0.11	0.09	-1.19	0.24	[-0.3, 0.1]

MODERATE Activity Level

* Fitness Content

Consumption	0.3	0.22	1.3	0.198	[-0.2, 0.7]
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HIGH Activity Level *

Fitness Content Consumption	0.49	0.22	2.24	0.028*	[0.1, 0.9]
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Note. Dependent variable: Mental well-being

*. Correlation is significant at the 0.05 level (2-tailed).

Discussion

The purpose of this study was to gain a better understanding of the effect of social media consumption regarding fitness-related content on TikTok and Instagram on mental well-being while looking for a possible effect of regular physical activity and controlling for the role of physical appearance comparison on social media. As Generation Z was found to be one of the most influenced generations by social media, individuals between the ages of 16 to 28 were chosen as the target group. Previous research investigated among other themes, the effect of fitness-related content consumption on regular physical activity and the effect of physical appearance comparison on mental well-being. However, little research was done regarding the investigation of the effect of regular physical activity on mental well-being, while taking the variables of fitness content consumption on social media and physical appearance comparison into account. Therefore, interest was raised in the possibility that regular physical activity could act as a positive moderator, influencing the relationship

between social media usage and mental well-being, while controlling for physical appearance comparison. The results of this research provide supporting evidence that there is a significant positive moderation effect of regular physical activity on the relationship between fitness content consumption on social media and mental well-being while controlling for physical appearance comparison.

Implications

These results suggest several theoretical and practical implications which were found by the descriptive analyses regarding the four measurement scales of fitness content consumption, regular physical activity, physical appearance comparison, and mental well-being.

These studies have some potential implications. For example, it can be summarized that the participants display good levels of mental well-being on average, meaning that they seem to have high mental well-being within two weeks before measurement. This pattern of results is comparable with the previous findings of a study where German individuals between the ages of 18-24 scored an average score of 51 in the WHO-5, the score might be insignificant lower in comparison to the sample in this study due to the corona pandemic in 2020 (Tsai et al., 2022).

For the adopted FBI-Scale it can be concluded that individuals show moderate fitness content consumption on average. This is in line with the findings of an Australian study that showed that 37% of 15–29-year-old individuals consume fitness-related content on social media, every week (Carrotte et al., 2015). For the adopted PAC-3 the average score reports a small tendency towards physical appearance comparison for the sample. In comparison to the mean physical appearance score of 52% reported by a study from Schäfer & Thompson (2018), there is only a small difference between the samples, indicating a similar finding among this age group. Regarding the regular physical activity scores, the percentage of individuals

categorized as highly active is in line with the findings of Bowe et al., 2019, who reported 32% of the study population of his sample as highly active.

Within the evaluation of the hypothesis, it was expected that individuals of Generation Z, who consume fitness-related content on Instagram or TikTok and behave in higher physical activity regularly, display a higher level of mental well-being while taking the effect of physical appearance comparison into account. The multiple regression analysis confirms this hypothesis. In this paper, it is shown that the higher the physical activity, the higher the mental well-being of Generation Z when consuming fitness-related social media content. This outcome is in line with previous findings from an article by Peluso & De Andrade, (2005), in which high physical activity was already found to be positively related to mental well-being. However, the article did not consider the effect of fitness content consumption on social media and physical appearance comparison. The positive effect found by Peluso & De Andrade, (2005) underlines the finding of the study that there is a significant positive correlation between the variables Regular Physical Activity and Mental Well-Being. Additionally, a study from Fox (1999) suggests that higher regular activity is associated with higher mental well-being.

But how to compare different studies who miss important variables and display differences or similarities in context of methodology, or population? In the following part this will be considered and integrated into a theory.

To start with, one study examined the relationship between physical appearance comparison on social media and mental well-being. The main findings displayed that physical appearance comparison on social media is negatively correlated to mental well-being in the United States and Korea (Lee et al., 2014). Although it should be considered that the sample demographics are not directly comparable, the finding of Lee et al., (2014) could be in line with the finding of this study, because of the variable of regular physical activity.

Second, the study by Kim (2022) already showed that there is a positive effect of social comparison on social media on motivation to exercise. Inferring, that social comparison could lead to higher regular activity, which is associated with higher mental well-being, fitness content consumption could be able to indirectly elevate mental well-being. Moreover, participants with high self-efficacy beliefs who consumed more content had a positive correlation with physical activity. This finding could explain the positive moderation effect of regular physical activity and provide a new theory to consider (Kim, 2022).

Namely, the theory of cognitive dissonance, in which the mismatch between an individual's behaviour and attitude can create a discrepancy, which leads to motivation to match behaviours and attitude again, could explain the effect of regular physical activity on the relationship between fitness content consumption and mental well-being, while controlling for physical appearance comparison (Harmon-Jones & Mills, 2019).

As shown in the study of Lee (2014) the body dissatisfaction created through physical appearance comparison of individuals on social media leads to poor mental well-being. For the case of our study, high regular activity might lead individuals to either discontinue training or foster the belief that they can achieve the perceived standards, for the case they normally would believe that they cannot achieve the perceived standards through physical appearance comparison. This could create high self-efficacy beliefs for the body satisfaction of individuals, leading to high physical activity and higher mental well-being. (Harmon-Jones & Mills, 2019). This means that the negative effect of physical appearance comparison could get cancelled out through the hope of achieving body satisfaction with regular physical activity, leaving only the positive effects of fitness content consumption behind.

In conclusion, it can be stated that fitness content consumption and physical appearance comparison can harm mental well-being. Regular physical activity seems to counterbalance these effects for individuals who consume fitness-related content on social

media. Therefore, it seems to be an effective tool for individuals of Generation Z to achieve better mental well-being. Shifting focus toward evaluating the study's strengths and limitations, several aspects underscore its relevance and credibility.

Strength and limitations

The study displays several strengths that underline its relevance. It can be stated that the measurement scales of the study are widely used, accepted, valid, and reliable. Therefore, the scales create a very effective tool for the measurement of mental well-being, fitness content consumption on the social media platforms Instagram and TikTok, physical appearance comparison within social media, and regular physical activity (Bech et al., 2003; Topp et al., 2015; Ellison et al. (2007); Schaefer & Thompson (2018); Craig et al. 2003). Regarding the sample it is shown in Table 1 that different ages are included in a well-distributed manner, creating the possibility for making inferences about German and Dutch individuals of Generation Z. Furthermore, the study is focused on two of the most commonly used social media platforms in 2023 (Statista, 2023). Therefore, the thesis provides valuable information about the effects of current social media platforms on mental well-being, mainly concerning fitness content consumption. Nevertheless, the study has certain limitations that must be considered. First, the population is more female than male as shown in Table 1. This could have created a population sample that is not sufficient for concluding the target group Generation Z (Theofanidis & Fountouki, 2018). Second, the sample size could have been bigger. Although the values were estimated as significant with a value of $\alpha = <.05$ and the sample size seems to provide a fair statistical power according to Eng (2003), more participants would provide a higher probability of correct results (Meyer, 2001). Furthermore, the sampling method could be biased due to participants that were selected mainly out of students from the University of Twente or out of individuals who were selected by the researcher via convenience sampling, this could lead to insufficient inferential abilities of the

sample group (Theofanidis & Fountouki, 2018). Some more limitations could be that participants only had one measurement time for each questionnaire and the questionnaires did not include questions that controlled for attention, some participants might have given socially desirable answers, or they might have interpreted questions differently than intended (Meyer, 2001). For instance, the integration of question testing for the attention of participants could ensure effective filtering of careless participants without affecting scale validity (Kung et al., 2018). These factors could all have led to deviations in results. Importantly, although 80% of participants stated that the reported variable Regular Physical Activity is a good representative of an average week of physical activity in their life, the variable Regular Physical Activity only measured one week. Lastly, it could be the case that other variables that were not included explain the effect of regular exercise, these could be variables like environmental mastery or purpose in life, leading to different implications for further research (Ryff & Keyes, 1995).

Implications for further research

This research provided useful insights into mental well-being, fitness content consumption, physical appearance comparison, and regular physical activity. Regarding before mentioned limitations of the study, it is important to consider changes in the study design for non-duplication. This includes using a randomised sampling method, a bigger sample size, the use of attention questions, precise formulation of the questionnaire answer possibilities and the inclusion of further variables like environmental mastery or purpose in life.

The study also creates the potential for further research into the topic. First, the consideration of longitudinal studies to track changes in mental well-being and health behaviours over time, particularly in Generation Z, could help to understand the dynamic nature of mental well-being concerning fitness content consumption and physical activity

(Rajulton, 2001). Second, a deeper understanding of the topic could be achieved with the conduction of qualitative research, maybe starting an investigation with interviews or focus groups. Third, the investigation of additional variables like sleep patterns, diet, and offline social interactions could provide more insights into the topic. Fourth, it would be wise to replicate the study for further validation or investigation of cultural and regional variations (Mackey & Porte, 2012). Fifth, a further investigation into the moderation variable could lead to valuable insight into how different physical activities influence mental well-being. This could be done by assessing parameters of training like exercise type, duration, and volume. For instance, a study by Rubenstein & Crim (1997) showed the positive effects of high-intensity strength training on quality of life. Lastly, the insights of the study could be used to develop mental well-being interventions, targeting younger adults by promoting healthy social media usage and physical activity habits by using the PRISM - the Practical, Robust Implementation and Sustainability Model. The PRISM is a tool that integrates different concepts that are relevant to translating findings into interventions (Feldstein & Glasgow, 2008).

Conclusion

This study presents the interplays between social media fitness content consumption, physical activity, and mental well-being among Generation Z individuals. The outcomes show that, on average, participants displayed good levels of mental well-being, indicating a small positive trend. The study also showed the positive relationship between higher physical activity levels and increased mental well-being.

The main takeaway of the research is, that the moderation effect of regular physical activity in enhancing mental well-being for those engaged in higher physical activity and fitness content consumption shows a promising avenue for promoting mental health among young adults, also while taking the variable of physical appearance comparison on social

media into account. Therefore, the study highlights the role of fitness content consumption and the potential positive impact of regular physical activity, positively moderating mental well-being.

These findings underscore the need for interventions that address both physical activity promotion and healthy social media habits among Generation Z. Future research should delve deeper into other factors influencing mental well-being and explore longitudinal or cross-cultural studies to enrich our understanding of this intricate relationship.

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