Master Thesis

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The impact of social media images on the body and appearance (dis-)satisfaction of users. A systematic review.

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Abstract

Background: The effects of mass media on body image (BI) have been analyzed for decades: in fact, mass media can negatively influence BI and body satisfaction. Social media and social media networks are newer phenomena that have been becoming very popular since 2004, and consequences on the users' health must be assessed. Several observational as well as few experimental studies aiming at analyzing the effects of social media on BI have been carried out worldwide.

Aim: The aim of this review was to evaluate the impact of exposure to social media images on the BI and appearance (dis-)satisfaction of the users. Also, as a side goal, this review aimed at understanding which factors may lie behind the process.

Methods: A systematic review of experimental literature published 2004-2021 was conducted on three databases. Studies had to be RCTs with a between-subject design, with interventions consisting of body-related images retrieved from social media and control groups consisting of neutral images retrieved from social media. Outcomes had to include measures regarding BI and appearance (dis-)satisfaction.

Results: In total, nine studies were identified. Risk of bias assessed with the RoB2 tool was rated as low for all studies. Synthesis identified exposure to body-related social media images was associated with a greater body dissatisfaction and/or negative BI. State appearance comparison was higher in almost all intervention groups than in the control groups. Also, exposure to the body-related images was found to be related to lower self-esteem as well as higher face and/or body discrepancies.

Conclusion: Exposure to social media images related to BI and body-ideals may negatively impact BI, appearance satisfaction, mood and self-esteem in adults. More research in the field is needed, especially focusing on more standardized practices in the trials. These findings should be taken into consideration for preventive measures both in public and private settings.

Plain language summary

What impact do social media images have on the BI and appearance (dis-)satisfaction of those who view the pictures?

What is BI and appearance (dis-)satisfaction?

BI is a term used to describe how a person perceives the own body, what feelings as well as thoughts a person has towards the own body: it's a subjective/inner perception. Appearance is a term used to describe the outer look and aspect of a person. Body dissatisfaction is a state in which a person has negative thoughts and/or feelings towards the own body. Body satisfaction is a state in which the thoughts towards the own body are positive.

Why is this an important topic?

Social media platforms are becoming more and more popular, and people, especially young people, spend a lot of time on these types of media. Past research has found out that traditional media, such as magazines or the television, can impact BI and cause body dissatisfaction. Thus, it's important to examine if this same effect can be found in social media as well.

What is the aim of this review?

This review investigated whether viewing body-related social media images can impact the BI and the satisfaction a person has of its own appearance. To answer this question, the author searched for available information on online databases and found nine studies meeting all the set criteria.

Key messages

There is evidence to suggest that the exposure to social media images which are related to body-ideals may impact negatively BI and body satisfaction of the people who see these images.

What was studied in the review?

In this review, nine randomized controlled studies were included. In these studies, the participants were exposed either to social media images depicting body-ideals or to neutral

social media images, such as travel or nature images. Before and after seeing the picture, the participants were asked to rate specific parameters, such as how satisfied or dissatisfied they were with their body, appearance, or face.

What are the main results of the review?

Overall, viewing images that show ideal bodies or ideal features of the body, such as the 'fitness ideal', had an negative impact on BI. This means that in all nine studies that were found, people who saw body-related pictures were more dissatisfied with the own body than the people who so control images. Also, it was found that those who saw body-related pictures also had a higher tendency to compare themselves and their body to the pictures seen.

How up-to-date is this review?

The evidence is current to 15 June 2021.

Index

Index of tables and figures

Index of tables

Index of figures

List of abbreviations

WHO = World Health Organization

BI = Body Image

VAS = Visual Analogue Scale(s)

HBSC = Health Behaviour in School-aged Children study

RoB2 = Rik of Bias 2 (Cochrane Risk of Bias tool)

1. Introduction

In 2019, social media was used by nearly 3.8 billion people: about half of the entire world population (We Are Social, 2020). On average, approximately 80 minutes per day are spent on social media platforms, and the level of usage increases from year to year (GlobalWebIndex, 2020). While social media is a phenomenon that has been developing since 2004 (Perrin, 2015), the possible impact of media in general on the body image (BI) and appearance (dis-)satisfaction of people has been a subject of research for many decades already (Grabe et al., 2008; Groesz et al., 2002; Thompson et al., 1999).

Although previous research has already shown that thin-media can have a detrimental effect on women's BI (Grabe et al., 2008), studies on the possible effects of social media on the BI and appearance (dis-)satisfaction are fairly new. Since people are spending increasing amounts of time on these platforms, understanding what health impact this level of usage could have, is crucial. While other authors have already summarized findings of observational studies in this area (Rounsefell et al., 2020), no summaries and reviews including only experimental studies, and in particular randomized controlled trials, have been published to date.

This review aims at filling this research gap. The primary objective of this review was to assess the impact of social media images on the body and appearance satisfaction and dissatisfaction of users. A side objective was to explore possible effect moderators regarding the impact of social media images on the body and appearance satisfaction and dissatisfaction of users.

The review is based on the PRISMA reporting scheme as well as on recommendations of the Cochrane Collaboration regarding systematic reviews and begins with a description of the theoretical background in chapter 2. Here, the development of the internet from its very beginnings up to the advent of the social media phenomenon is described. Additionally, BI, appearance, and theories regarding the influence of BI and measurement tools are described here. Finally, chapter 2 provides an overview of the possible impacts of social media on BI and describes the current research status on this topic.

Subsequently, the research question and objective of the thesis are presented in chapter 3.

Following the presentation of the aim, the method used for the review is described in detail. First, eligibility criteria for study selection are presented, after which the information sources and search strategy are shown. The selection process follows, including pictures showing the software used. The data collection process and data items are also reported, while the performed risk of bias assessment and the tool used are introduced in chapter 4.7. Subsequently, the effect measures, synthesis methods and the reporting bias assessment are shown.

A transition from the methodology to the results is found in chapter 5. First, selected studies and a flow chart describing the process are presented. Following on from this, the characteristics of the studies are described and summarized in several tables. The results of the assessment of risk of bias are illustrated in chapter 5.3., after which the included studies are presented individually, and the results are synthetized.

The results section is followed by the discussion, which is divided into three parts. Firstly, the applied methodology is presented, along with its strengths and limitations, and discussed. A discussion of the results, in which the findings of the included studies are explored and put into context follows on from this. Finally, recommendations for practice and future research are made and a future outlook is presented.

This thesis is rounded off with a conclusion.

2. Theoretical background

The following chapter addresses three central aspects that are needed to understand the importance of the research question and to better contextualize the findings of the presented studies. In the first part, the internet and the social media phenomenon are discussed, including the history and the development of the internet up to the introduction of social media platforms. In the second part, important aspects regarding BI and appearance and their implications for health are outlined and measurement methods and tools are presented. Lastly, the impact of mass media and social media on BI are described.

2.1. The internet and the social media phenomenon

2.1.1. The development of the internet

To be able to present a definition and an explanation of social media and its related services and impacts on society, including the impact on health and BI, it is important to briefly describe the development of the internet as a whole, and the aspects and dynamics that have changed over the passing years. The history of the internet is very complex, as it comprises many different aspects. This includes the technology behind it, which has been in continuous development since its initiation, and also how this technology is organized and used by the community, as these aspects are also subject to continuous change (Leiner et al., 2009).
The word ‘internet’ derives from the combination of the words ‘interconnected’, and ‘network’, and its origin goes back to the early 1960s. From there on, the internet has developed and grown to become the vast network we now know. Today, millions of people, services, and businesses across the globe rely on the power of the so-called internet, but what is now called ‘internet’ has only existed since around 2003, and is very different from the earlier versions in terms of its features (Brenner & Lemke, 2020).

Developed in American military settings, the internet was created because secure and robust connections and communication links between computer networks were needed for a better workflow. Until then, networks and computers could not communicate and exchange information, which made collaboration more difficult and time-consuming (Leiner et al., 2009; Meinel & Sack, 2013, p. 5; Brenner & Lemke, 2020). The system was developed and extended in the 1960s and early 1970s, and was only expanded to out-of-military settings in the late 1970s, when four university networks in the USA were connected by a bigger network called ARPANET for research purposes (Leiner et al., 2009; Meinel & Sack, 2013,

p. 5; Brenner & Lemke, 2020). Once again, the goal here was to incentivize collaboration and the exchange of information, although during this time the internet was only available for restricted purposes. It was only later on, in the early 1990s, that the developed network was opened up for commercial purposes, which led to a worldwide expansion of the internet that grew to the extent it is known today (Leiner et al., 2009; Meinel & Sack, 2013, p. 5; Brenner & Lemke, 2020).

Back at the time when the internet was opened up for commercial use, the most important services available on the internet were 'e-mail', the 'World Wide Web' (known as WWW) and 'File Transfer Protocols' (FTPs) (Lemke & Brenner, 2015, pp. 168–169). The electronic mail (e-mail), which is still known and used today, and which was already developed and used before the internet became commercial, is a system of electronically sending written messages from one computer to another (Van Vleck, 2012). The World Wide Web (WWW) is a later invention, that was developed in 1989 at the European Organization for Nuclear Research (CERN), with the aim of creating a digital space where large documents and information could be stored, shared and universally accessed by people around the globe (CERN, 2021). The File Transfer Protocol (FTP) is a communication protocol that was also developed somewhat later, in 1985, with the objective to promote the sharing of files between remote computers using an efficient and reliable host (Postel & Reynolds, 1985).
These three services, which were the core of the internet in the early 1990s, had a very static nature, which means that they provided their users with services and data, and with possibilities to share data or retrieve information, but they did not allow an interaction between the users (Brenner & Lemke, 2020; Lackes & Siepermann, 2020). Furthermore, these services were offered on less-intuitive platforms that were not user-friendly and were embedded in more complex software packages (Lackes & Siepermann, 2020).

With the passing of time, the very static nature of the internet changed and developed into a more dynamic service. At the beginning of the 2000s (around the year 2003), the internet services evolved into what is now called 'Web 2.0', a term coined by Tim O'Reilly (O'Reilly, 2007). The technology behind the Web 2.0 is not new, but is simply rather a development of what the internet had to offer (Brenner & Lemke, 2020). The interfaces are simpler and more intuitive, and smaller and easier applications (frequently called 'apps') replace the use of big software packages. Web 2.0 is also characterized by being adaptable

to different types of devices, such as web and mobile, and providing experiences to the people using it (O'Reilly, 2007; Lackes & Siepermann, 2020).
This makes the Web 2.0 a platform that is easier to use than previously, and where people can not only retrieve information, but where they can also actively participate and contribute (O'Reilly, 2007; Brenner & Lemke, 2020; Lackes & Siepermann, 2020).

2.1.2. Social media as a phenomenon of the Web 2.0

Social media are one of the many phenomena that have emerged in the Web 2.0 since the internet became more interactive and easier for people all over the world to use (Lackes & Siepermann, 2020).
About half of the world population, nearly 3.8 billion people, used social media in the year 2019. In Germany, about 45 percent of the total population was active on social media in that same year (We Are Social, 2020). The COVID-19 pandemic further increased social media use (GlobalWebIndex, 2020).
For millions of people worldwide, following the activities of others on online platforms has become a daily activity (Lin et al. 2018). In fact, in 2019, people in Germany spent 80 minutes daily on social media on average. When the numbers are compared to those from past years, the level of usage shows an upward trend (GlobalWebIndex, 2020). Statistics show that, in Germany, the proportion of social media users is highest in the 14- to 39-year-old age group (93–100%), although 87 percent of 40- to 49-year-olds also use social media (Statista, 2018).

Many terms, such as 'social media', 'social network' and 'social media network' are often used interchangeably, even though distinctions should be made between them (Social Media Today, 2015). In the following section, the different types are briefly described.

2.1.2.1. Social media

The term 'social media' is usually used to describe the "forms of electronic communication (such as websites for social networking and microblogging) through which users create online communities to share information, ideas, personal messages, and other content (such as videos)" (Merriam-Webster, 2021b). Thus, people have the possibility to publish their own work online, for example through 'blogs' or 'wikis', to which other people have access and consume. In this constellation, there are usually people who publish work, and people

who view – and thus consume – the published work. There might be a direct interaction or communication between the two parties, for example through comments posted under a blog post, but interaction is not the primary focus and is thus mostly limited (Social Media Today, 2015). The term social media is most commonly found in the literature and is often used to describe the broader phenomenon of digital communication online. However, even though this term is used in literature and in this review, it is important to highlight that what is usually referred to as 'social media platforms' or 'social networking sites' (SNS), is in fact a 'social media network'.

2.1.2.2. Social media networks

Social media networks describe platforms that promote networking and direct interaction between the users (Kaplan & Haenlein, 2010). These are the very well-known platforms and apps used daily by billions of people around the world, and their popularity started to rise around the year 2004, when Facebook was launched (Perrin, 2015; Facebook, 2021). Since then, many other types of social media networks were created and many features overlap. Furthermore, new platforms and features are also being added every day, as each platform wants to offer the best user experience in order to have a high numbers of users (Kaplan & Haenlein, 2010). While the main focus of all social media networks is the connection and interaction between the users, many other features that have been added over the past years have increasingly moved into focus, such as the selling of products via social media networks or the marketing conducted by so-called 'influencers' (Khamis et al., 2017).

The most widely used social media networks (messenger apps excluded) include Facebook, YouTube, Instagram and TikTok (We Are Social, 2020). In January 2021, Facebook counted a total of 2.7 billion users, followed by YouTube with 2.3 billion, and the messenger apps WhatsApp (2 billion) and Facebook Messenger (1.3 billion). In the ranking, these are followed by Instagram (1.2 billion), WeChat (1.2 billion) and TikTok (689 million) (We Are Social, 2020). The usage of each platform varies markedly depending on the age group. While YouTube is the most frequently used network among children aged five to 15, with 89 percent of them using the platform (Ofcom, 2018), and is also the top social media network for the 'generation Y' and 'generation Z', Facebook remains the most frequently used platform for people of the generation of the 'baby boomers' (1946–1964) and of the 'generation X' (1965–1976) (GlobalWebIndex, 2020).

There is no systematic way in which different social media applications can be categorized (Kaplan & Haenlein, 2010). However, social media agencies and social media experts have started to distinguish between the different platforms in order to provide a structure, which is presented in the following section (Digital Vidya, 2018; Storm, 2020). When examining such a structure, it is important to always bear in mind that, due to the dynamic nature of these applications, there are no clear boundaries, and their functions can overlap.

Social networks

Social networks are platforms such as 'Facebook', 'Twitter', 'Xing' and 'LinkedIn'. They are used to create connections between individuals, companies, and brands. Social Networks can be used for the generation of leads, for the development of a consistent branding, for the building of relationships and for many other, mostly business-related, aspects (Digital Vidya, 2018). On a personal level, these networks are used to keep contacts, share personal information or to discuss topics among people of a same network. Here, networking and the direct interaction between users are a core functionality.

Media sharing networks

'Instagram', 'Snapchat', 'YouTube' and the newest platform 'TikTok' are media sharing types of social media networks. The sharing of media such as photographs, videos and music are the core function of these platforms. More functions have been added in recent years and these networks provide complete experiences for the users, although their central feature remains the sharing of media (Digital Vidya, 2018). These platforms usually have a higher reach of people, as the content is mostly available to the general public.

Discussion forums

Platforms such as 'Quora' and 'Reddit' belong to the so called 'discussion forums' category. These channels are mostly used for finding, discussing, and sharing information, news, and opinions on specific topics. Usually, questions are posed that can be answered by the users. Discussion forums were very popular before the advent of platforms such as Facebook, YouTube and Instagram (Digital Vidya, 2018).

Bookmarking networks

'Pinterest' and 'Flipboard' are the two most popular bookmarking networks. The core function of these platforms is to give the user the opportunity to save information found on

the web by creating ‘bookmarks’. Users can collect ideas, interesting information, and media, and save these on a personal profile, making it easier to find this information at a later stage. The users can also share their personal bookmarks, thereby reaching other people (Digital Vidya, 2018).

Consumer review networks

Consumer review networks such as ‘Yelp’, ‘Zomato’ and ‘TripAdvisor’ offer users the possibility to review and rate public spaces, such as hotels, restaurants, or tourist attractions. The users can publish their opinion online and other users can access and read the reviews. There is usually no direct contact between the users (Digital Vidya, 2018).

In research, and in everyday life, the term social media is mainly used to refer to social media networks (Digital Vidya, 2018). In order to be in line with the literature, in this review the term ‘social media’ is used throughout, even though social media networks are the focus and main subject of the research. The literature review will thus concentrate on social networks and media sharing network platforms.

2.1.2.3. Social media stakeholders

Social media is based on users who have an account on the platform(s) and interact with other users. In general, users connect around a common topic or around a given person and build up their contact around the contents that are produced and published (Khamis et al., 2017). Depending on the platform or network, the way of connecting and communicating can differ. However, in most networks, such as in Instagram, YouTube or TikTok, a clear distinction among users can be made.

Content producers

On the one side, there are the content producers, who are described using many different terms including ‘influencers’, ‘content creators’, ‘youtubers’, ‘tiktokers’, instagrammers’, ‘podcasters’ or ‘digital artists’. The products created are usually digital products and media, such as videos, photos or podcasts, which can also contain advertisements or calls to action (Geyser, 2017a, 2020; Lenkert, 2020).

Content producers can be people from any sector and any background, and there are no specific rules that guarantee success. The main measure of social media success is an

engaged audience, with engagement being the measurement of comments, likes and shares on the platform. The higher the engagement, the higher the quality of an account and of a content producer (McLachlan, 2020). From models to photographers, and moms to fitness gurus, there are thousands of successful content producers worldwide. In fact, content producers are peers who simply have become successful in the digital world. The more followers a producer has, the more reach they have, as they have a larger number of people who consume their digital products (Geyser, 2017a). Content producers can earn money through their activity on social media, since they are often booked for 'influencer marketing' (Influencer Marketing Hub, 2017) and so called 'product placements'. For instance, a mid-tier influencer (with 20,000 to 100,000 followers) can earn up to €2,300 for a single post, while influencers with over one million followers can earn over €15,000 euro for one post (Statista, 2021). For example, Chiara Ferragni, the Italian influencer regarded as the most important fashion influencer in the world by Forbes (Forbes, 2017; quotidiano.net, 2017), is estimated to earn between €45,000 and €75,000 per post, as she has 24 million followers (Geyser, 2017b). Famous content producers have become the modern form of celebrities, and they can influence and affect the decisions of their entire community and fanbase (Lee & Watkins, 2016; Berryman & Kavka, 2017).

Community

On the other side, there are the users who consume the products by following the content producers. They are also known by different terms depending on the platform, such as 'followers', 'subscribers', or 'fans'. As each content producer is also a user, he or she can also be a follower, fan, or subscriber of other content producers by following their work.

The sum of all the users who follow one specific creator is usually called a 'community'. Thus, the community is the ensemble of users who have a common interest, which, in the case of social media, is one creator or account (Douma, 2007).

As there are no limits to the number of accounts a user can follow or subscribe to, a user is always automatically part of hundreds of different communities, one for each person followed.

2.1.2.4. Social media networks opportunities and challenges

Social media networks offer features to their users that simultaneously bring opportunities and challenges.

The possibility of being connected with hundreds or thousands of people makes it easier to create networks and to spread information (Kaplan & Haenlein, 2010). This can be used positively, when the information shared is important or in order to keep in touch with friends, colleagues, or businesses. However, it can also have a negative effect, as fake news or inaccurate information can spread very fast (Talwar et al., 2020). One further challenge of social media networks is the proliferation of advertisements through the postings of content producers and influencers. In fact, around 70% of all marketing experts work with influencers to promote products or contents (Influencer Marketing Hub, 2017). Using celebrities in advertising is not a new phenomenon, as it was also extensively featured in the traditional media, for example to promote unhealthy food choices (Jenkin et al., 2014; Pournaghi Azar et al., 2018; Pourmoradian et al., 2021), smoking (Emery et al., 2012), and alcohol consumption (Stautz et al., 2016; Henehan et al., 2020). However, on social media this practice bring more challenges than it does in the traditional media. This is due to the fact that on these platforms, such as for example on Instagram, both peers and famous influencers as well as celebrities have accounts (Boyd, 2021). While celebrities are recognized as being 'something different' and something to be admired for (Jankowski, 2021), since they have always been portrayed like this in the traditional media as well, famous content producers represent themselves as being peers, even though their followers do not really know them personally (Fardouly & Vartanian, 2016). In contrast to celebrities, influencers often offer intimate access to their lives, thereby reinforcing the peer-relationship, and encourage intimacy and trust by doing so (Berryman & Kavka, 2017). This can be used by companies to promote their products (Veirman et al., 2017).

2.2. Body image and influence theories

2.2.1. Definition of appearance, body image and (dis-)satisfaction

Body image (BI)

BI is a term used to describe the subjective, and thus internal, evaluation and perception of the own body (Cash & Pruzinsky, 2002; Mountford & Koskina, 2015; Grogan, 2017). It is a very complex phenomenon that comprises the self-perceptions related to the body and the personal attitudes, including the thoughts and beliefs, the feelings and the behaviours an individual has towards their own appearance (Cash, 2012). It is also closely connected to other aspects such as ethnicity, gender and different sociocultural factors (Smolak & Thompson, 2009, p. 50; Cash, 2012).

BI is a phenomenon composed of many aspects and dimensions and comprises four main components:

1. the own evaluation of the body, also called the 'global subjective satisfaction' or 'perceptual BI',
2. the feelings that a person has about their own body, and its size, and shape, also known as 'affection' or the 'affective BI',
3. the investment in the appearance and the beliefs about the body, also defined as 'cognitions' or 'cognitive BI' and
4. the avoidance of situations of body exposure, also called 'behaviours' or 'behavioural BI'

(Grogan, 2017; The National Eating Disorders Collaboration [NEDC], 2021).

In the past five decades, research on BI has mainly been focused on young women and girls, whereas research on men and boys started during the past 15 to 20 years. However, it is important to mention that, while research mainly focused (and still focuses) on younger members of the population, BI and problems related to it are also relevant to men and to older members of the population (Grogan, 2006).

Appearance

Appearance is the term used to describe the outward aspect or external looks of a person or object (Merriam-Webster, 2021a), or the state, condition, manner or style in which a person or object appears to an observer (Dictionary.com, 2021). The term is mostly used in conjunction with the term 'body', thus referring to the external appearance of the body.

Body dissatisfaction

Body dissatisfaction is a term used to define a state in which a person has negative thoughts and/or feelings regarding their own body (Tiggemann, 2012; Grogan, 2017). Body dissatisfaction is usually related to a negative evaluation of specific body components, such as the body's shape, size, or weight. Body dissatisfaction is usually derived from a discrepancy, perceived by the individual, between an ideal body standard that they have internalized, and their own body that does not meet this standard (Grogan, 2017). Most research on BI has focused on body and appearance dissatisfaction (Grogan, 2006), although it is important to highlight that BI encompasses many other aspects than merely the dissatisfaction (Thompson, 2004).

2.2.2. Factors influencing body image

As described, BI is a very complex phenomenon that is composed of many different aspects, and that can therefore be influenced negatively (risk factors) or positively (protective factors) in several different ways.

2.2.2.1. Risk factors

In the past decades, many researchers have tried to further understand the underlying factors that influence the development of BI (Smolak & Thompson, 2009).

In their book on the assessment, prevention, and treatment of BI, eating disorders and obesity in young girls, the authors Smolak and Thomson describe several social, interpersonal, and biological risk factors for a negative BI, including:

- internalization of the 'thin' ideal
- social comparison
- media influences
- self-esteem
- peer teasing
- peer modelling
- peer conversations
- paternal and maternal comments
- paternal and maternal modelling
- child sexual abuse
- sexual harassment
- serotonin, dopamine, and norepinephrine levels
- genetics
- body mass index (BMI)
- ethnicity

(Smolak & Thompson, 2009).

However, although single risk factors have been identified and studied over the past few decades, a significant amount of research within theoretical frameworks and models only gained attention in more recent years (van den Berg et al., 2002). In the following, some of the most important theoretical frameworks and models are presented that are needed for a

deeper understanding of the review. The instruments used to measure these factors are also described.

The Tripartite Influence model

The Tripartite Influence model was proposed by Thompson and colleagues (Thompson et al., 1999) and states that BI ideals are mainly influenced by three variables: parents, peers and mass media. According to the model, these three elements communicate specific ideals and reinforce these, thus influencing the development of BI in younger people. Additionally, the model proposes that these influences have an impact on the BI due to two pathways, namely the internalization of the BI ideals present in society and the appearance comparison (Thompson et al., 1999).

Social comparison theory

The social comparison theory is a framework which argues that individuals have an inner drive to compare themselves with external subjects in order to evaluate their own characteristics. The theory suggests that this especially takes place when there is no possibility to measure the characteristics objectively. Individuals evaluate what others have achieved or look like as being realistic and compare themselves with the other (Festinger, 1954). The social comparison theory can also be applied to areas other than BI and appearance. In the case of BI, the subject of comparison are body characteristics, such as weight, height, and size (Tiggemann & McGill, 2004). The more a person is seen as being similar, the higher the probability for an individual to compare themselves with that person (Tiggemann & McGill, 2004).

2.2.2.2. Protective factors

The presented risk factors can play a role in the development of the negative perception of the own BI and appearance. However, it must also be taken into consideration that every individual encounters at least one of the highlighted risk factors during their childhood or adolescence. Despite this, not all children (or adults) develop a negative BI only because of a negative encounter. This is due to the fact that, alongside the risk factors, some protective factors can also play a role in the development of BI (Smolak & Thompson, 2009).

Again, there are single factors on the individual and sociocultural levels that can protect people from developing a negative BI or appearance dissatisfaction. These include:

- body appreciation
- a mindful response to internal cues (such as hunger, sexual desire)
- experience of body functionality
- positive perception of the self
- self-compassion
- perceived love and acceptance from God
- perceived experiences of autonomy and freedom
- supportive family relationships
- media literacy
- feminist influences

(Tylka & Diest, 2015; Levine & Smolak, 2016).

Regarding the risk factors, some theoretical frameworks and theories can also explain concepts that can protect individuals from developing a negative appearance perception.

Self-determination theory

The self-determination theory argues that individuals have a tendency to regulate their own behaviour based on choice and interest (Deci & Ryan, 2000). When basic psychological needs for autonomy, competence and relatedness are satisfied, individuals can reach an optimal level of psychological well-being, a state in which behavior is regulated more by intrinsic values rather than needing external validation (Vansteenkiste & Ryan, 2013). In the case of BI, the satisfaction of basic psychological needs may have a protective effect, shielding the individual from the sociocultural messages about 'ideal' bodies (Pelletier et al., 2004).

Self-efficacy theory

The self-efficacy theory, developed by the psychologist Bandura, argues that "expectations of personal efficacy determine whether coping behavior will be initiated, how much effort will be expended and how long it will be sustained in the face of obstacles and aversive experiences" (Bandura, 1977). Thus, self-efficacy reflects the ability of a human being to be confident in their ability to control specific areas of life, such as motivation, behaviour or social situations (Bandura, 1977). In the area of BI, self-efficacy might be protective, as an individual who has a higher self-efficacy is more secure about their own capabilities.

2.2.3. Body image, appearance and health

BI and appearance play a pivotal role in human health. For instance, negative BI can be a risk factor or a cause for unhealthy behavior in many areas of life (Grogan, 2006).
For example, studies showed that the perceived overweight status, and therefore appearance dissatisfaction in adolescents, is negatively associated with academic performance, regardless of the weight the adolescents' actually have (Florin et al., 2011).
A negative BI can also affect physical activity and exercise (Grogan et al., 2004), and is a possible risk factor for depressive mood and low self-esteem in adolescents (Paxton et al., 2006). Other studies found out that concerns with appearance might lead to the use of anabolic steroids or drugs to improve muscle development (Murray et al., 2016).
Moreover, appearance and body dissatisfaction are associated with the risk of developing and/or maintaining an eating disorder and adopting a lower quality diet (Stice, 2002; Neumark-Sztainer et al., 2006; Hart et al., 2015). Because quitting smoking could lead to weight gain, a negative BI might also lead to a fear of quitting smoking, causing smokers to not quit the bad habit (Lopez Khoury et al., 2009).

Especially in adolescence, body dissatisfaction reaches high levels: in fact, the cross-sectional HBSC (Health Behaviour in School-aged Children) study by the World Health Organization (WHO) in 2018 found that more than one in four 15-year-olds (27%) perceived themselves as being too fat. In girls, levels of body dissatisfaction were higher (21%) than in boys (22%), and body dissatisfaction increases as the adolescents grow older (Inchley et al., 2020). However, negative BI in girls has seen a decline since 2014, when 40% of the girls were dissatisfied with their weight, although the percentage has not changed in boys (Inchley et al., 2016, 2020).

The literature shows that body concern, BI and appearance dissatisfaction are strongly linked with health and can play an important role in many of the daily health behaviours of people (Grogan, 2006).

2.2.4. Body image assessment and measurements

Due to the growing research interest regarding the topic of BI and appearance dissatisfaction, many assessment tools aimed at evaluating several dimensions of BI have been developed worldwide (Grogan, 2006). The studies included in this review also include BI assessment

tools, which is why these are presented here for a better understanding of the subsequent chapters.

Virtual Analogue Scales on Mood and Body Dissatisfaction

In 1995, two researchers (Heinberg & Thompson, 1995) developed Visual Analogue Scales (VAS) targeting the state of mood and body dissatisfaction of people who view images of other people's bodies. At time of development, images were taken from traditional/mass media. For the measurement of the mood, five dimensions are evaluated: anxiety, depression, happiness, anger, and confidence. For body dissatisfaction, three dimensions are assessed: weight dissatisfaction, appearance dissatisfaction and facial features dissatisfaction. The VAS developed by Heinberg and Thompson are still in use today, and can also be partially adopted in studies.

Body Image States Scale

Developed by Cash and colleagues, the Body Image States Scale (BISS) consists of six items that cover six domains of the current body experience of the individual:

- dissatisfaction-satisfaction with one's overall physical appearance
- dissatisfaction-satisfaction with one's body size and shape
- dissatisfaction-satisfaction with one's weight
- feelings of physical attractiveness-unattractiveness
- current feelings about one's looks relative to how one usually feels
- evaluation of one's appearance relative to how the average person looks

(Cash et al., 2002).

Each question has to be answered on a 9-point Likert-type scale. The higher the cumulative value, the greater the body satisfaction of the person (Cash et al., 2002).

Body Satisfaction Scale

The Body Satisfaction Scale (BSS) was developed in 1990 (Slade et al., 1990). The test is designed to measure body satisfaction and dissatisfaction regarding 16 body parts, divided into three main categories: the 'general parts', the 'head parts' (facial) and the 'body parts'. The test is characterized by being very short, taking only two to three minutes to complete. Participants can answer the questions with a rating scale that ranges from 'very satisfied' (1) to 'very dissatisfied' (7).

Body Appreciation Scale-2

The Body Appreciation Scale (Tylka & Wood-Barcalow, 2015) assesses individuals' acceptance of their bodies. It includes key elements of a positive BI: appreciating and accepting the beauty and the functions of one's own body, accepting imperfections of the self, and protecting from negative influences or idealized images. It includes ten items rated on a 5-point scale which ranges from 'never' (1) to 'always' (5).

State Appearance Comparison Scale

The State Appearance Comparison Scale, which is intended to measure the principles highlighted in the social comparison theory (Festinger, 1954), is used to assess how participants regard their own body and appearance, and to what extent they compare their appearance with the appearance of people they see pictures or images of. The tool evaluates the responses on a 7-point Likert scale (Tiggemann & McGill, 2004).

Basic Psychological Need Satisfaction and Frustration Scale

The Basic Psychological Need Satisfaction and Frustration Scale measures to what degree the basic psychological needs for autonomy, competence and relatedness are met (Chen et al., 2014). The scale addresses need satisfaction and frustration in an individual's life. Participants respond to twelve items on a 5-point scale from 'not true at all' (1) to 'completely true' (5).

Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale (RSES) measures self-esteem on a 10-item scale that measures global self-worth by measuring both positive and negative feelings about the self. The items are answered on a 4-point Likert scale that ranges from 'strongly agree' to 'strongly disagree'(Rosenberg, 1965).

State Self-Esteem Scale

The State Self-Esteem Scale (SESS) aims at measuring short-lived changes in self-esteem, as self-esteem can rise and fall as a function of the aspirations and achievements of a person. The three facets of self-esteem, namely appearance, performance and social, are included in the scale. The items are scored on a 5-point scale from 'not at all' (1) to 'extremely' (5) (Heatherton & Polivy, 1991).

Beck Depression Inventory

The Beck Depression Inventory is a 21-item scale that measures characteristic attitudes and symptoms of depression. It is a self-reporting questionnaire and there are different versions with different numbers of questions. It can be used for both psychiatric and non-psychiatric participants (Beck et al., 1996).

Physical Appearance Perfectionism Scale

The Physical Appearance Perfectionism Scale (PAPS) measures the 'worry about imperfections' as well as the 'hope for perfection' using two subscales. In other words, the scale is used to assess both positive and negative aspects of physical appearance perfectionism, which are possible risk factors for body-related concerns and problems (Yang & Stoeber, 2012).

Cognitive Emotion Regulation Questionnaire

The Cognitive Emotion Regulation Questionnaire (CERQ) aims at assessing the emotions and thoughts a person experiences after stressful or threatening events. The questionnaire consists of nine different areas that correspond to nine cognitive emotion regulation strategies, such as 'self-blame', 'positive refocusing' and 'acceptance' (Garnefski & Kraaij, 2006).

State Self-Discrepancy Index

The State Self-Discrepancy Index is a tool used to measure appearance discrepancy, meaning an incongruity between an aspect one has and an aspect one would like to have. Participants are asked to write down aspects of their physical appearance that they would like to change, and to rate how different they would like to be from their current state and how significant this difference would be to them (Dittmar et al., 1996).

Muscular Subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-4

The Sociocultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4) is a tool used to assess societal and interpersonal aspects related to appearance ideals. There are several subscales, one of which is the 'muscular subscale'. This subscale measures the extent to which participants internalize a specific muscular ideal and appearance. Different statements

regarding muscular appearance are answered with 5-point scales that range from ‘definitely disagree’ (1) to ‘definitely agree’ (5) (Schaefer et al., 2017).

2.3. Current state of knowledge on the impact of media and social media on body image

2.3.1. Mass media on body image

Over the past few decades, many researchers have studied the possible associations between mass media and BI as well as on body or appearance dissatisfaction. In both experimental and correlational studies and meta-analyses, a consistent negative effect of thin-media on women’s BI could be observed (Groesz et al., 2002; Grabe et al., 2008). In fact, as also argued by theoretical frameworks such as the Tripartite Influence model, mass media are one of the most influential factors on BI and appearance dissatisfaction (Thompson et al., 1999; Groesz et al., 2002; van den Berg et al., 2002).

Previous research has shown that media offer an unrealistic beauty standard that often cannot be attained. The images usually show women who have unattainable proportions, flawless skin, thin waists, long and slender legs and well-developed breasts, the so called ‘thin-ideal’ (Groesz et al., 2002; Grabe et al., 2008). The beauty standard usually includes thin and attractive female bodies that fit into the ideals of the Western Society (Hargreaves & Tiggemann, 2003; Wasylkiw et al., 2009). For men, a muscular physique with a ‘V-shaped’ torso is considered ideal (Edwards et al., 2014). This might create mixed feelings of shame and low self-esteem in the viewer (Tiggemann & Slater, 2004).

Another important aspect is the enhancement and editing of pictures on mass media, which is done in order to obtain pictures matching the beauty standards (Reaves et al., 2004), and which also creates unachievable standards of beauty that lower self-esteem. Celebrities also play an important role in mass media, as they are often regarded as role models, even though they are seen as being ‘distant’ (Google, 2016).

2.3.2. Social media on body image

As described in chapter 2.1., in recent years changes in the internet have also brought on a change in the way people communicate and retrieve information. In the past, mass media, such as magazines and the television, as well as more static websites, were the most commonly used forms of media, while social media have seen an exponential growth in

more recent years (Perrin, 2015; We Are Social, 2020). Social media and traditional mass media have several aspects in common that also have an impact on BI.

As is the case in the mass media, in social media a particular focus lies on images and videos, with images – that are often edited – portraying unattainable beauty standards (McLean et al., 2015). The beauty standards that are applied usually fit the ideals of a given society. Authors have discovered that women can feel unhappy with their appearance, or can have an increase in negative mood, when they view pictures of attractive women with ideal proportions on both traditional media (such as magazines and television [Grabe et al., 2008]) and on social media (such as Facebook and Instagram [Fardouly & Vartanian, 2016; Cohen et al., 2017]) .

However, social media differs from other types of media as it is easier to use, free of charge and is thus more accessible to people of any age. The scope, accessibility and the pervasiveness of social media are different than the traditional media, such as magazines and the television (Kaplan & Haenlein, 2010). As described in chapter 2.1.2.3., social media networks are built like peer-to-peer platforms, where celebrities, influencers and ordinary users share the exact same platform, and are able to connect and network. Social media networks are therefore the first platforms in which the line between celebrities, VIPs, content creators and peers have been blurred (Fardouly & Vartanian, 2016). The rise of the so called 'micro-celebrities' and 'instafamous' people is an important social media phenomenon (Khamis et al., 2017).

The transmitted feeling of intimacy creates the illusion of similarity between the 'famous person' and the 'ordinary person', which means that a 'famous' influencer might be regarded as a peer instead of a celebrity (Google, 2016). However, the more a person identifies others as being peers or similar to themselves, the more a comparison is likely to be made that affects the person's self-perception. This is due to the fact that similar people, such as friends and peers, are seen as equals (Major et al., 1991).

Another difference to mass media is that the users share many insights into their everyday lives. However, as this is mostly done for the purposes of self-promotion, only 'good' moments worth sharing are shown (Khamis et al., 2017; Usher, 2020). Young people seem attracted to images of good looking people, living dream lives and who consume or wear expensive and luxurious items (Khamis et al., 2017). This, however, creates the illusion that the lives of others are perfect, which might hurt the self-esteem of the viewers, and which therefore subsequently could also hurt or negatively impact their body perception.

2.3.3. New body image trends on social media

BI ideals and standards have always existed and have changed significantly throughout the course of history, especially for women. This is due to the fact that historically, a woman's body, appearance and looks were always influenced by social and cultural ideologies, beliefs and values (Ngo, 2019; Parker, 2009). The so called 'thin-ideal', which was already widely diffused in the traditional media and is still highly present on social media, pressured women to lose weight and be thin, and numerous studies have shown the detrimental effects of this for their self-esteem and body satisfaction (Mask & Blanchard, 2011; Fardouly & Vartanian, 2016).

Next to the thin-ideal, a new trend and body ideal has also started spreading on social media in recent years, namely the 'muscular and fit' ideal. In addition to these two trends, many other trends are also propagated through social media networks, including 'mukbang' and 'cookbang', 'foodporn', 'veganism' and other food or health-related topics (Rossi & Adam, 2021). However, in the following sections, only 'thinspiration' and 'fitspiration' are explained in more detail due to their relevance for the review.

2.3.3.1. Thinspiration

The name 'thinspiration' (figure 1), usually used in social media as a hashtag (#) refers to pictures and/or messages involving thin bodies that promote thinness (Alberga et al., 2018). The term became popular in the early 2000s when images of skinny women with visible bones started to proliferate on the internet. The trend then became popular on social media as well. While many of the hashtags related to thinspiration and eating disorders have already been banned back in 2012 (Huffpost, 2012), the images can still be found on social media by simply searching for similar or modified words (Chancellor et al., 2016).

Figure 1: Typical #thinspiration images that can be found on social media (Hindustan Times, 2017)

2.3.3.2. Fitspiration

The term 'fitspiration' (figure 2) refers to a more recent trend that developed since social changes regarding body size and image took place (Carrotte et al., 2017; Alberga et al., 2018). Fitspiration, which derives from the words 'fitness' and 'inspiration', promotes the ideal of a more muscular body, characterized by muscular but lean arms and lower body, and a toned abdomen (Homan et al., 2012). In general, accounts sharing fitspiration images also often post pictures about food and diets, as well as exercises and lifestyle tips.

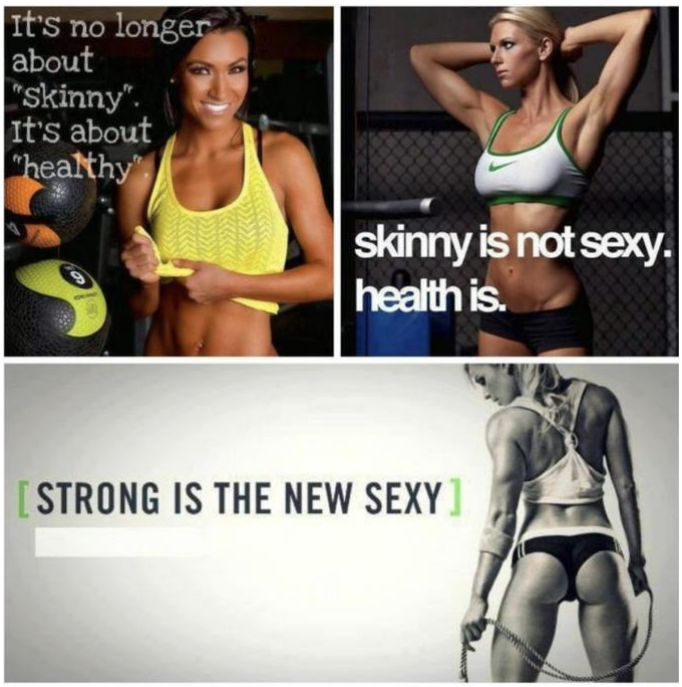


Figure 2: Typical #fitspiration images that can be found on social media (Nykjaer, 2014)

3. Research question and aim of the review

As described in the previous chapter, research on the effects of mass media on BI has already been carried out for several decades (Thompson et al., 1999; Groesz et al., 2002; van den Berg et al., 2002). In recent years, the amount of research that analyses the effects of social media on BI has also increased (Holland & Tiggemann, 2016; Rounsefell et al., 2020). Since the technologies involved are fairly new, the effect and consequences on the users' health must be assessed to correctly regulate and create policies around their use. Additionally, an important factor is that especially younger users spend much time on social media (Ofcom, 2018), meaning that they might suffer stronger health consequences, if these effect and consequences are not identified in time.

The results of observational studies have already been synthetized in two systematic reviews (Holland & Tiggemann, 2016; Rounsefell et al., 2020). These reviews concluded that social media use might have a maladaptive effect on BI and on food choices (Holland & Tiggemann, 2016; Rounsefell et al., 2020). It must also be considered that the field of research around social media is constantly growing, and that new studies are published monthly, therefore reviews from 2016 and 2020 might not include some of the newer relevant studies.

To the author's knowledge, no systematic review that includes experimental studies only has been carried out prior to May 2021. However, analysing and synthetizing the results of experimental studies is very important: experimental studies mimic the real situation and can therefore produce results that are more similar to what happens to the users in real life. Furthermore, synthetizing current research practices in the field provides an overview on various methods, so that future studies can be further optimized.

From the background information outlined in chapter 2, the following research question emerges:

What impact do social media images have on the BI and appearance (dis-)satisfaction of the people viewing them (the users)?

Primary goal

To address the research question, in this review, the current evidence regarding social media images and BI and appearance (dis-)satisfaction was gathered

> to examine what impact viewing social media images has on the BI and appearance (dis-)satisfaction of its users
>
> > to gain insights on the possible health impacts that social media has, and to make recommendations to policymakers and for future studies in the field.

In addition to this main goal, information on possible factors and/or moderators regarding the impact of social media images on BI were collected (side goal).

4. Methods

A systematic review of interventional quantitative studies was conducted. The study design, implementation, analysis, and reporting followed The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) protocol. The new PRISMA 2020 statement was used for the process, as the authors advised that the 2009 statement should no longer be used (Page et al., 2021). Following literature, the PRISMA 2020 thus replaces the 2009 edition (Page et al., 2021) and the reporting of the methods therefore also follows the PRISMA 2020 item checklist (PRISMA, 2020). The full checklist can be found in the appendix.

4.1. Eligibility criteria

The criteria for considering or excluding studies for the purposes of this review were set by defining a PICOS (Population, Intervention, Comparison, Outcome, Study Design) schema (Cochrane Deutschland Stiftung, Institut für Evidenz in der Medizin, Institut für Medizinische Biometrie und Statistik et al., 2020). This schema was used consistently for the entire selection process. The inclusion and exclusion criteria are presented in detail in the following section, including explanations of the reasons behind the choices made. A schematic overview can be found in table 1.

4.1.1. Population

Inclusion criteria

Studies involving any participants, including adults, adolescents, and children, regardless of their weight and their country of residence were included in the study. This is in line with the criteria set by other authors (Holland & Tiggemann, 2016; Rounsefell et al., 2020). Additionally, people of any health status – except for participants with a previously or currently diagnosed eating disorder – were included in the study.

Exclusion criteria

Regarding the population, only studies targeting or including a population with a previously or currently diagnosed eating disorder were excluded. This criteria was set in order to avoid bias, as previous literature shows that body (dis-)satisfaction is closely connected to unhealthy weight control behaviours, which are also closely connected to eating disorders (Neumark-Sztainer et al., 2006).

4.1.2. Intervention

Inclusion criteria

Eligible studies had to include at least one experimental condition with an intervention in which participants were shown appearance-related pictures retrieved from social media (stimuli) paired with questionnaires on BI both before and after the exposure to the stimuli. This criteria was chosen because no review on this topic had analysed interventional studies up to the date the search was conducted (Holland & Tiggemann, 2016; Rounsefell et al., 2020).

Only studies with interventions that showed stimuli consisting of appearance-related (face- and/or body-related) social media pictures were included. These criteria were set because the peer presence and the exchange and publication of visuals (such as photographs and videos) can significantly influence BI concerns (Perloff, 2014). Additionally, the pictures shown had to be taken from social media platforms, and the intervention had to either be administered in one sitting, or on one day, to be included. This was to ensure that the chosen studies included both a realistic setting and social media experience.

Exclusion criteria

Studies in which no questionnaire was administered, or where a questionnaire was not administered before and/or after the stimulus were excluded, because a before-after comparison was needed. Studies in which a stimulus was shown paired with obvious comments or disclaimers were also excluded to eliminate any possible disturbing factors. Studies not showing appearance-related pictures, but rather images focusing on other characteristics of people, such as wealth or success, were not included, in order to focus the topic only on appearance-related images. Studies in which the pictures shown were not directly taken from social media (but for example, from magazines or picture databases) and which were not shown in one sitting on one day only were excluded, as these would not offer a realistic experience of social media usage and thus might offer a biased result.

4.1.3. Control

Inclusion criteria

Eligible studies had to include a control group in which participants were shown non-appearance-related pictures retrieved from social media (stimuli) paired with questionnaires on BI both before and after the stimuli. The pictures either had to be appearance-neutral or not related to the human body (e.g. nature, travel, or animal pictures). The pictures shown

also had to be taken from social media platforms, and the intervention had to be administered in one sitting or on one day to be included.

Exclusion criteria

Studies in which no questionnaire was administered, or where a questionnaire was not given before and/or after the stimulus were excluded. Studies that did not include a control group, or that included a control group with a stimulus that was not appearance-neutral were also excluded. Finally, studies in which pictures were either not taken directly from social media but were taken, for example, from magazines or picture databases, or were not shown in one sitting or on one day only, were also excluded.

4.1.4. Outcome

Inclusion criteria

The outcomes of interest were the impact of seeing the intervention 'social media pictures' on BI and body/appearance satisfaction/dissatisfaction as a first or second outcome. BI measures had to be assessed both before and after being administered the stimulus (picture), in order to have a comparison.

Studies analysing other outcomes, such as mood or appearance comparisons were also included, but only if BI measures were presented separately and their impact could be distinguished from that of the other measures.

Exclusion criteria

Studies with outcomes other than the BI (body/appearance satisfaction/dissatisfaction) were excluded. Additionally, studies where the BI measures were only taken once (and not before and after the stimulus) were excluded. Where the BI measures could not be distinguished from other outcome measures, the study also had to be excluded.

4.1.5. Study fesign

Inclusion criteria

Only experimental studies including an intervention with one or more experimental condition(s) and a control condition were included. This approach was chosen because no review on this topic had analysed interventional studies to date (Holland & Tiggemann, 2016; Rounsefell et al., 2020). The study design had to be a between-subject design and the

allocation of the participants to the conditions had to be performed randomly. Studies were included if they met these criteria, even if they did not directly claim to be randomized controlled trials. Furthermore, only studies published in English between January 2004 and June 2021 were included in the analysis. These dates were chosen, as social media was not popular prior to this time, and only since 2004 has the interest in these media increased (Perrin, 2015; Facebook, 2021).

Exclusion criteria

Non-experimental studies, such as observational only studies, were not included. Additionally, if the studies did not include a control condition and if the allocation of participants to the conditions was not performed randomly, these had to be excluded. If a within-subject design was used, these studies were also excluded. Finally, studies published before 2004 and that were not in English were excluded from the literature review.

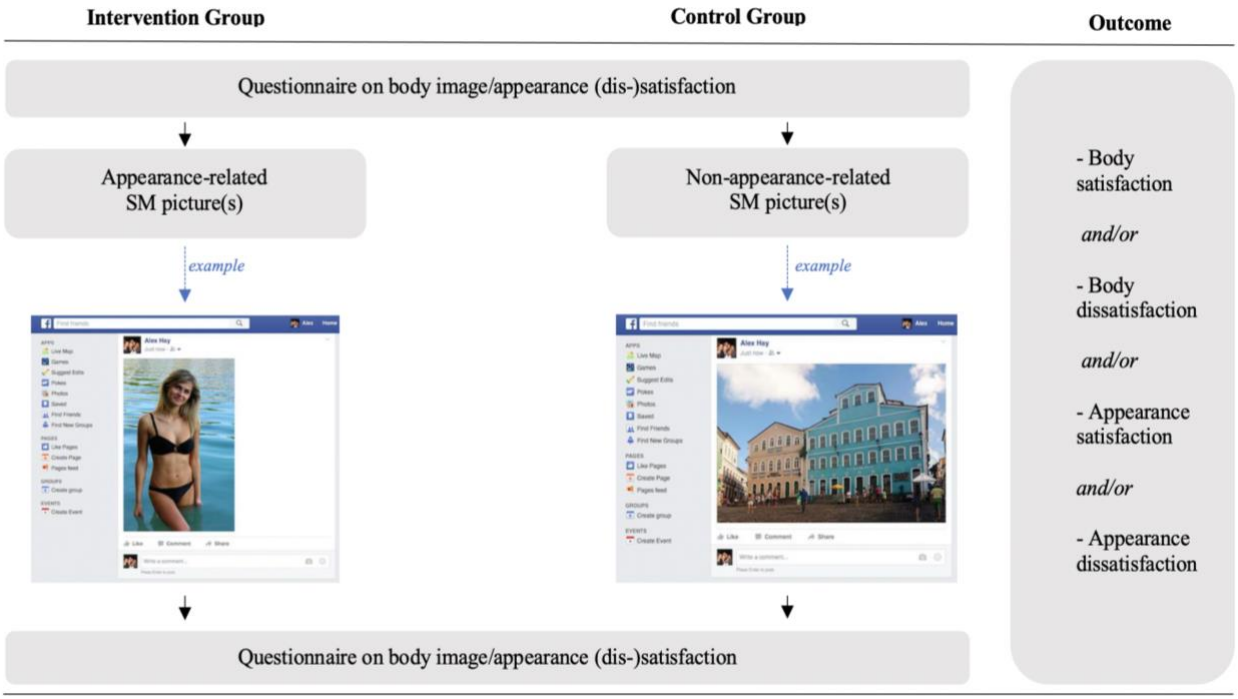


Figure 3: Own representation of the minimum requirements that needed to be fulfilled to be included in the selection (Facebook pictures taken from Brichacek et al., 2018)

For the synthesis, the studies were grouped as follows: firstly, studies were grouped by the first set outcome 'impact on body and appearance dissatisfaction', before possible moderators or explanatory factors regarding the impact on BI and appearance were presented.

Table 1: Inclusion and exclusion criteria for study selection following the PICOS schema

	Inclusion criteria	**Exclusion criteria**
Population	• Any age (adults, adolescents, children) • Any weight • Any country of residence	• Previously or currently diagnosed eating disorder
Intervention	• Social media picture(s) paired with questionnaires before and after exposure • Face- and/or body-related picture(s) • Picture(s) taken from social media platforms • Administered in one sitting/on one day	• No questionnaire(s) before and/or after intervention • Picture(s) shown with obvious comments or disclaimers • Picture(s) not face and/or body-related • Picture(s) not taken from social media • Not administered in one sitting/on one day
Control	• Social media picture(s) paired with questionnaires before and after exposure • Appearance-neutral picture(s) • Picture(s) taken from social media platforms • Administered in one sitting/on one day	• No questionnaire(s) before and/or after intervention • Non-appearance-neutral picture(s) • Picture(s) not taken from social media • Not administered in one sitting/on one day
Outcome	Measures of: • Body satisfaction *and/or* • body dissatisfaction *and/or* • appearance satisfaction *and/or* • appearance dissatisfaction taken both before and after exposure to the stimuli	• Measures not related to body and/or appearance (dis-) satisfaction • Outcomes not distinguishable • BI measures not taken consistently before and after exposure to the stimuli
Study Design	• At least one experimental condition • At least one control condition • Random allocation of the participants into the conditions (groups) • Between-subject design	• No experimental condition • No control condition(s) • No random allocation of participants • Within-subject design

4.2. Information sources

To identify potential sources, a literature search was carried out. The most important scientific electronic databases were included in the search, including PubMed, Scopus and Cochrane Central. In Cochrane Central, only the databases CINAHL and Embase were included (a filter was set) and were searched, as all other citations were from PubMed, which was searched separately.

ScienceDirect was not used as a database for the search, as the database Scopus already indexes nearly the entire ScienceDirect database, but without indexing the full texts (Elsevier, 2018). Thus, by searching in Scopus, literature from ScienceDirect is automatically included.

The searches were performed between the 1st and the 15th of June 2021, and the final searches and retrieval of the citations were performed on the 15th of June 2021. All searches were performed by connecting from Germany via the VPN of the Hamburg University of Applied Sciences.

4.3. Search strategy

Search criteria were restricted to peer-reviewed papers published between 2004 and 2021, as set in the eligibility criteria.

The search terms used included a keyword combination of weight and BI related words with social media keywords. These keywords were selected by analysing the only two systematic reviews that had investigated the topic of social media and eating behaviour (Holland & Tiggemann, 2016; Rounsefell et al., 2020). These two systematic reviews were identified during a previous systematic search that was aimed at identifying the research gap in the field. The platform 'TikTok' was also added to the search terms, as its popularity only increased in 2018, when the authors of the previous reviews had already completed their searches (Perez, 2018).

The search terms regarding weight and BI were as follows:

- eating disorder
- disordered eating
- body image
- body dissatisfaction
- body satisfaction

- drive for thinness
- drive for muscularity
- thin ideal
- weight perception
- weight cycling
- weight concern
- appearance

Search terms regarding social media were the following:

- social media
- social networking sites
- facebook
- twitter
- instagram
- tumblr
- pinterest
- flickr
- tiktok
- youtube

The search terms were altered to suit the individual requirements of each database used, including MeSH terms. In Scopus, filters regarding journal types were set to include all journals of life sciences.

The Boolean search strategy as well as filter used and number of results for each database are shown in table 2. The full search strategy for all the analysed databases can be found in the appendix.

Table 2: Boolean search strategy used in the databases,

Database	Date of search	Search query	Filters used	Results (N)
PubMed*	15.06.2021	((((((((((eating disorder*) OR (disordered eating)) OR (body image)) OR (body dissatisfaction)) OR (body satisfaction)) OR (drive for thinness)) OR (drive for muscularity)) OR (thin ideal)) OR (weight perception)) OR (weight cycling)) OR (weight concern)) OR (appearance) AND ((((((((((social media) OR (social networking sites)) OR (facebook)) OR (twitter)) OR (instagram)) OR (tumblr)) OR (pinterest)) OR (flickr)) OR (tiktok)) OR (youtube))	Date of publication: Starting from January 2004	3,098
Scopus	15.06.2021	((((((((((“eating disorder*”) OR (“disordered eating”)) OR (“body image”)) OR (“body dissatisfaction”)) OR (“body satisfaction”)) OR (“drive for thinness”)) OR (“drive for muscularity”)) OR (“thin ideal”)) OR (“weight perception”)) OR (“weight cycling”)) OR (“weight concern”)) OR (“appearance”) AND ((((((((((“social media”) OR (“social networking sites”)) OR (facebook)) OR (twitter)) OR (instagram)) OR (tumblr)) OR (pinterest)) OR (flickr)) OR (tiktok)) OR (youtube))	Date of publication: Starting from January 2004 Subject areas: - Medicine - Social Sciences - Psychology - Computer Science - Arts and Humanities - Agricultural and Biological Sciences - Health Professions - Decision Sciences - Multidisciplinary Document types: - Articles Source type: - Journal	3,164
The Cochrane Collaboration (Central)*	15.06.2021	((((((((((“eating disorder*”) OR (“disordered eating”)) OR (“body image”)) OR (“body dissatisfaction”)) OR (“body satisfaction”)) OR (“drive for thinness”)) OR (“drive for muscularity”)) OR (“thin ideal”)) OR (“weight perception”)) OR (“weight cycling”)) OR (“weight concern”)) OR (“appearance”) AND ((((((((((“social media”) OR (“social networking sites”)) OR (facebook)) OR (twitter)) OR (instagram)) OR (tumblr)) OR (pinterest)) OR (flickr)) OR (tiktok)) OR (youtube))	Date of publication: Starting from January 2004 Databases: - Embase - CINAHL	2,031 (Embase n = 1,891; CINAHL n = 140)
*In PubMed and Cochrane quotation marks are used as they are needed for search purposes				

4.4. Selection process

Once the searches were run, the selection process of the study records was managed using Rayyan (www.rayyan.ai), a web and mobile app developed for systematic reviews. Rayyan allows the reviewer to organize, screen and label citations faster thanks to a user-friendly interface and semi-automation tools, such as the possibility to find duplicates or to code included and excluded studies (Ouzzani et al., 2016). The examiners may access the full analysis in Rayyan by asking the author for an invite link to log into the app.

In a first step, the search results from the databases were imported into Rayyan and possible duplicate records were automatically detected by the software and manually checked by the reviewer. Titles and authors (and, if needed, other details such as the date or DOI) were compared to ensure that the detection of the duplicates was correct. Once all the duplicates had been removed, the main inclusion and exclusion codes (labels) were setup in Rayyan to have these ready for the assessment for eligibility.

The exclusion reasons were coded as follows:

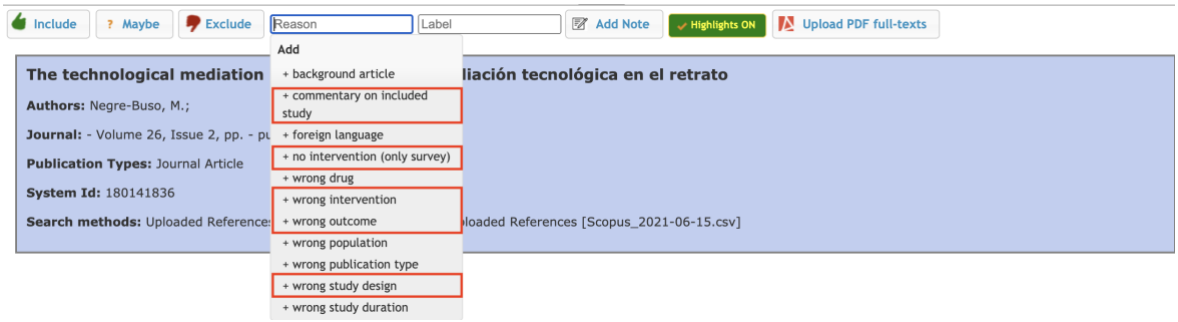
- 'Wrong intervention'
- 'No intervention'
- 'Wrong outcome'
- 'Wrong study design'
- 'Commentary on included study'

Subsequently, the remaining articles were assessed for eligibility against the set inclusion and exclusion criteria. The process was performed in a three-level step that was completely performed using Rayyan and following the PRISMA 2020 process (which is, both in terms of the process and in the flow chart, different to that of the 2009 process).

4.4.1. First Screening (Step one)

First, a title screening was performed. During this stage, all retrieved citations from the databases were checked by the reviewer and only the titles of the records were assessed against the set criteria. If the citation's title met the inclusion criteria or if it was unclear whether it did in all respects, the citation was labelled as a 'maybe' in Rayyan.

If the citation title met at least one of the set exclusion criteria, the citation was immediately excluded. Excluded papers were coded with reasons for the exclusion as follows: ‘Wrong intervention’, ‘No intervention’, ‘Wrong outcome’, ‘Wrong study design’, ‘Commentary on included study’. This step was used to ensure a higher transparency in the selection process. Figure 4 shows a screenshot of the Rayyan tool during the process. Some codes for exclusion reasons such as ‘background article’ were pre-programmed into Rayyan and could not be deleted, which is why they are visible in the figure. However, these were not used by the reviewer.



Note that only the reasons highlighted in red were created and used by the reviewer, while the others were pre-programmed and were not used.

Figure 4: Screenshot of the Rayyan Software during first screening in the selection process including the codes for exclusion.

4.4.2. Retrieval of reports (Step two)

In a second step, the abstracts of the citations that were labelled as ‘maybe’ during the first screening were retrieved. In most cases, the abstracts were already in Rayyan, as these were automatically imported. When abstracts were not in Rayyan, they were retrieved online. If they could not be retrieved due to limitations in the Hamburg University of Applied Sciences (HAW) subscriptions, the articles were retrieved by either asking the authors for a copy via ResearchGate or by searching through other networks, such as the network of the Universitätsklinikum Eppendorf (UKE). Once retrieved, the missing abstracts were also imported into Rayyan.

4.4.3. Assessment of eligibility (Step three)

Lastly, all the retrieved studies marked as ‘maybe’ were assessed against inclusion and exclusion criteria by analysing the abstract. The studies that did not meet the inclusion criteria were excluded and coded with the same exclusion reasons mentioned previously.

Only the studies meeting the inclusion criteria in the abstract screening were finally assessed in the full text. For this step, full texts were retrieved using the same procedure as in step two, either via the HAW network, the network of the UKE or through the use of ResearchGate. Once retrieved, the full texts were also imported into Rayyan. Here, a last assessment against the set criteria was run and the final studies to be included in the review were identified.

The full selection process is shown in the PRISMA Flow Chart in figure 7.

4.5. Data collection process

The data of the identified studies was collected by one reviewer only, as this review is for a Master thesis and thus must be performed individually. The data was collected by analysing the full-text versions of the included studies that had been selected via Rayyan in the third step on the selection process. The data collection step was performed both analogically on paper and via Zotero, the software used for literature management (Zotero.org, 2021). The Rayyan software was no longer used for this step.

A data extraction template for the extraction of the data in the studies was created and tested prior to extracting the data from all the included studies. Five days after the extraction, a second run was performed through the included studies to identify any possible information that was overlooked in the first run. As the data extraction process is usually performed in a team, the reviewer decided to repeat the extraction process to reduce the possibility of any mistakes in the extraction.

4.6. Data items

The data extracted included: reference details, population characteristics (sample size, age, BMI, ethnicity), intervention and control procedures, outcome, study design, country, social media network analysed, randomization process, results, and key findings.

4.7. Study risk of bias assessment

4.7.1. The RoB 2 tool

The Version 2 of the Cochrane risk-of-bias tool for randomized trials (RoB 2) in the version tailored for individually randomized parallel-group trials was used to assess the quality of the articles. The RoB 2 is a tool that provides a framework for assessing the quality of trials,

making it possible to better interpret the results presented in the studies (Higgins et al., 2019). The goal of the assessment with the RoB 2 tool is to analyse different areas and domains of a study in order to identify possible bias.

In the RoB 2, five domains are addressed, namely:

1. "bias arising from the randomization process;
2. bias due to deviations from intended interventions;
3. bias due to missing outcome data;
4. bias in measurement of the outcome;
5. bias in selection of the reported result."
   (Higgins et al., 2019).

For each domain, specific questions are asked. These questions help the reviewer to identify important evaluation points and can be answered with the following response options:

1. yes
2. probably yes
3. probably no
4. no
5. no information

(Higgins et al., 2019).

To perform the risk of bias assessment, the official RoB 2 'Excel evaluation sheet' was used to evaluate the included studies, whereas the 'cribsheet summarizing the tool' was used as a guide to answer the questions. The complete copy of the risk of bias evaluation from the Excel sheet can be found in the appendix.

4.7.2. Procedure of the risk of bias assessment

All the given questions within each domain for each individual study were answered and descriptory or explanatory comments were added when needed. As the Excel sheet was pre-programmed with an algorithm, the responses given to each question were then summed up which resulted in a score or risk of bias judgement for the analysed domain, which could either be 'low', 'high' or with 'some concerns'. The reviewer could then either accept the score produced by the algorithm or give another score if there were sufficient reasons for doing so (figures 5 and 6).

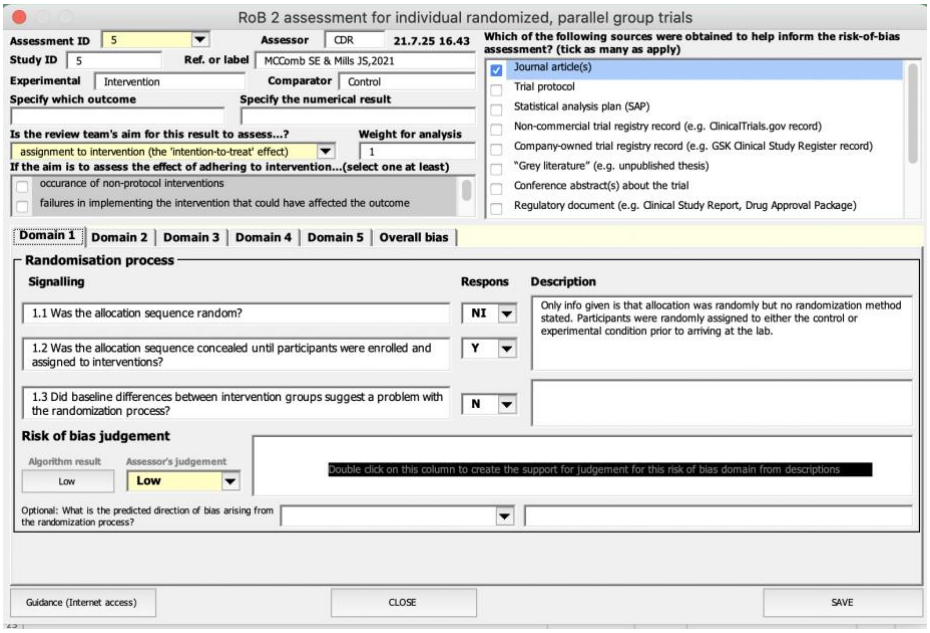


Figure 5: Risk of bias assessment for the domains in the official Excel sheet by Cochrane.

The procedure was repeated for each domain and study. In the final step, the scores of the five domains were summed up to determine a final judgement, which again could be 'low', 'high' or with 'some concerns'. Once again, the algorithm-generated score could either be accepted or a different score determined. Discrepancies in the final score derive from different scores given by the algorithm and the reviewer (figure 6).

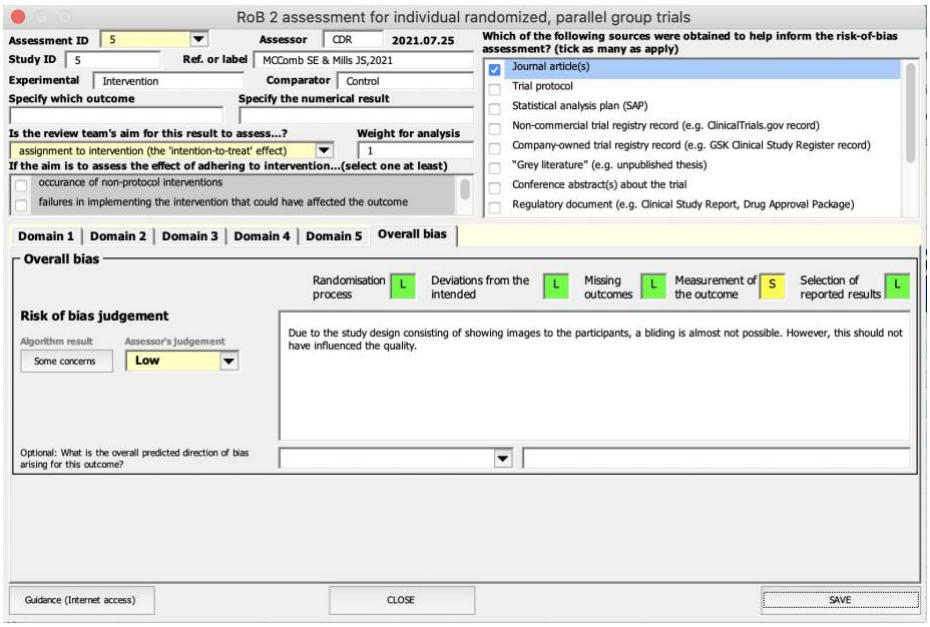


Figure 6: Overall risk of bias assessment in the official Excel sheet by Cochrane.

The final scores were then used to correctly interpret and discuss the results of the given papers.

4.7.3. Explanation of the scores given

The studies were considered to be at an overall low risk of bias when the scores of the five domains were all of low risk, or if there was not more than one unclear criterion (with no criterion being at high risk of bias). Studies were judged to be at an overall unclear risk of bias (some concerns) if more than one domain was at an unclear risk of bias (with no criterion being at high risk of bias). Studies were judged to be at a high risk of bias if one or more domains were unclear or at high risk.

4.8. Effect measures

Primary measures for the review were defined, as these are required to answer the first and primary research question and thereby fulfil the objective of this review. All studies needed to incorporate at least one of the primary measures presented in order to be included. Possible moderators regarding the impact of social media on the BI were also collected, as described in chapter 3.

The primary measures were measures closely related to the assessment of BI or appearance (dis-)satisfaction. There are different scales that can be used for measuring this, including the Body Image States Scale (Cash et al., 2002), the Body Satisfaction Scale (Slade et al., 1990), the Body Appreciation Scale-2 (Tylka & Wood-Barcalow, 2015) and the body (dis-) satisfaction VAS (Heinberg & Thompson, 1995) (see Chapter 2.2.4).

4.9. Synthesis methods

The study results were synthetized according to study quality (as assessed with the RoB2 tool), population demographics and study characteristics. As all studies included needed to incorporate at least one primary measure, the synthesis was performed by synthetizing the results targeting the primary outcome: BI and appearance (dis-)satisfaction. Furthermore, when the relevant information was available in the given studies, data regarding the side goal was also retrieved, i.e. the gathering of information regarding possible moderators of the impact of social media images on BI.

4.10. Reporting bias assessment

Possible reporting biases were also assessed with the RoB2 tool, which analyses the bias in selection of the reported result in the fifth domain. Here, the focus lies in the assessment of

selective non-reporting as well as the selection of the reported results in the study (Higgins et al., 2019, p. 2). In this procedure, a study was directly judged to be at a 'high risk' of bias if any outcome or results was omitted in the description of the findings.

Other types of possible reporting bias were also taken into consideration during the analysis and are discussed in the discussion of methods (chapter 6.1). These types of bias include: time lag biases, location biases and language biases, as described in the Cochrane Handbook (The Cochrane Collaboration, 2021b).

4.11. Certainty assessment

To assess certainty in the body of evidence, an approach following the GRADE (Grades of Recommendation, Assessment, Development and Evaluation Working Group) approach was used (Schünemann et al., 2013). The GRADE approach is used by organizations worldwide and is recommended by Cochrane (The Cochrane Collaboration, 2021a). Certainty of the evidence was assessed using the five domains stated by GRADE: risk of bias, consistency of effect, imprecision, indirectness, and publication bias (Schünemann et al., 2013). In this process, studies are given an initial level of certainty depending on the study design, with randomized trials given a high certainty and observational studies given low certainty. Then, the certainty score can be lowered or raised depending on other factors. If there is risk of bias, inconsistency, indirectness, imprecision or publication bias, certainty should be lowered. If the effect is large or if the dose response is high, the certainty might be raised (The Cochrane Collaboration, 2021a). Finally, the level of certainty gives the overall quality of the evidence, needed to correctly contextualize findings. The certainty of evidence can be high (++++), moderate (+++), low (++) or very low (+).

5. Results

5.1. Study selection

The literature search on PubMed, Scopus, and Cochrane (CINAHL, Embase) retrieved 8,293 studies. Of these, 1,141 were duplicates and were removed. After the first screening of 7,152 citations, 6,981 studies were excluded (97.6%) and 171 reports were sought for retrieval and were then assessed for eligibility by means of abstract and full-text screening. Of these, only nine studies meeting all the inclusion criteria were included in the review (Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Brichacek et al., 2018; Fardouly & Rapee, 2019; Prichard et al., 2020; Sampson et al., 2020; Tiggemann & Anderberg, 2020; Dignard & Jarry, 2021; McComb & Mills, 2021). All the other studies were excluded for not meeting the criteria in terms of the following: wrong intervention (N = 67), no intervention (N = 82), wrong outcome (N = 3), wrong study design (N = 9), commentary (N =1). An overview of the 162 excluded studies can be found in the appendix. Figure 7 provides an overview of the selection process in the form of a flow chart.

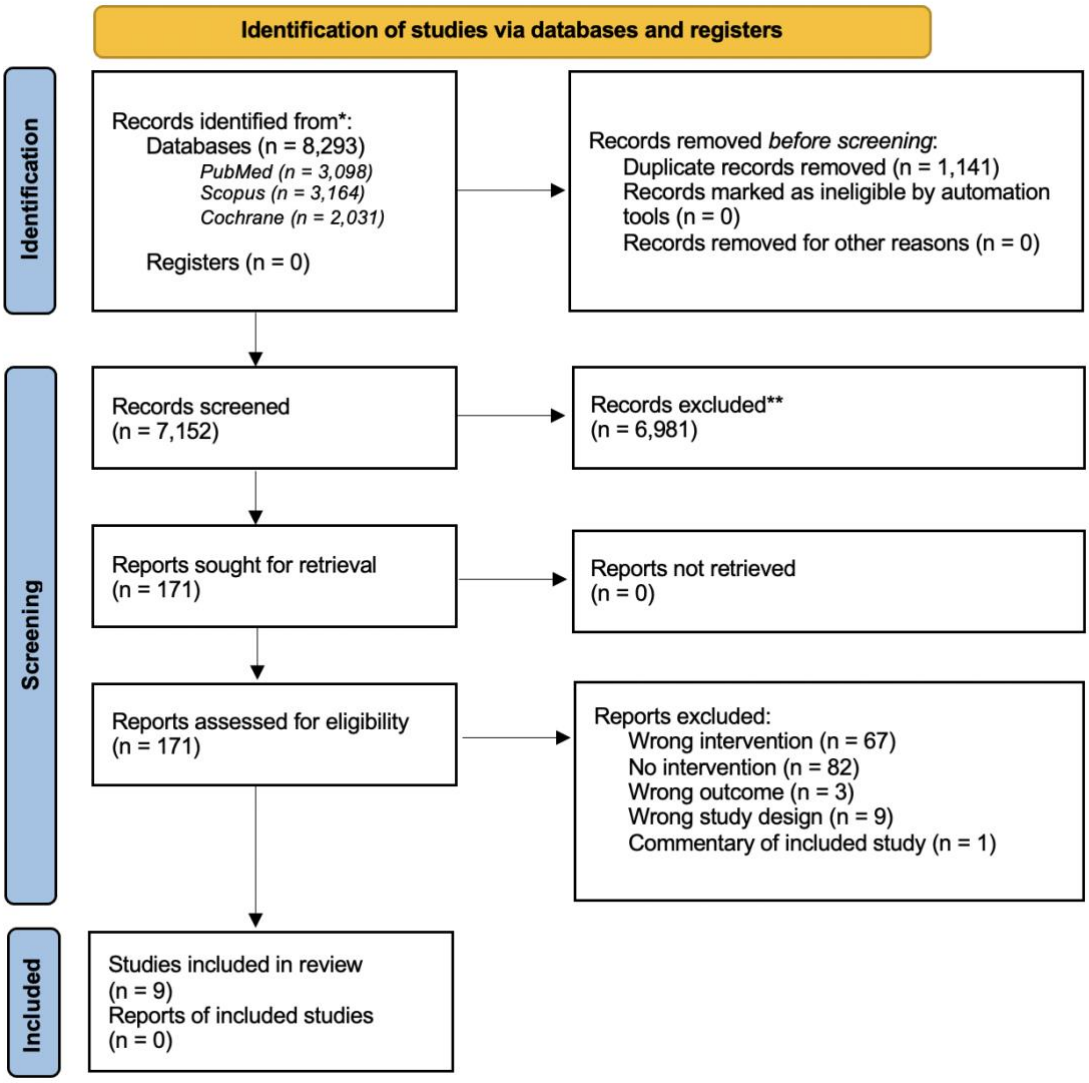


Figure 7: PRISMA flow diagram for selection of the studies

5.2. Study Characteristics

5.2.1. Participants

In total, there were 1,654 participants across nine studies. Six studies (Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Fardouly & Rapee, 2019; Prichard et al., 2020; Dignard & Jarry, 2021; McComb & Mills, 2021) included only female participants, one study (Tiggemann & Anderberg, 2020) included only male participants and two studies (Brichacek et al., 2018; Sampson et al., 2020) included both male and female participants. The participants from all studies were college students, except for the study by Tiggemann and Anderberg (2020), which recruited male participants via TurkPrime. All participants in the included studies were adults over the age of 18. The majority (> 50%) of the participants in each study was of 'Caucasian'/white ethnicity and Asian. In one study, ethnicity was not

described (Tiggemann & Zaccardo, 2015). The mean BMI of the participants from all studies was between 19 and 26, meaning that the participants were therefore all of either normal or very slight overweight (World Health Organization (WHO), 2020).

5.2.2. Intervention

Only one study (Brichacek et al., 2018) examined pictures shared on Facebook, whereas the other eight studies analysed Instagram pictures. Five studies only had one experimental group (Tiggemann & Zaccardo, 2015; Brichacek et al., 2018; Prichard et al., 2020; Sampson et al., 2020; McComb & Mills, 2021), whereas four studies (Brown & Tiggemann, 2016; Fardouly & Rapee, 2019; Tiggemann & Anderberg, 2020; Dignard & Jarry, 2021) had two experimental groups. The intervention always consisted of appearance/body-related images taken from social media. Four studies had a particular focus on fitspiration images (Tiggemann & Zaccardo, 2015; Prichard et al., 2020; Tiggemann & Anderberg, 2020; Dignard & Jarry, 2021) whereas the other studies focused on body-related pictures with no particular specification. Two studies (Fardouly & Rapee, 2019; Sampson et al., 2020) had a particular focus on face appearance satisfaction, while the other studies included the body as a whole.

5.2.3. Control

All studies had control groups and allocation to groups was performed randomly, as defined in the eligibility criteria. Participants in control groups received neutral images as a stimulus. Six studies used travel images (Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Brichacek et al., 2018; Fardouly & Rapee, 2019; Prichard et al., 2020; Dignard & Jarry, 2021), two studies administered nature/scenery images (Sampson et al., 2020; Tiggemann & Anderberg, 2020) and one study (McComb & Mills, 2021) administered pictures of landscape paintings to the control group.

5.2.4. Outcome

An overview on the measures used for the set outcomes is shown in Table 3.

Primary outcome

In all studies, the measure was BI or appearance (dis-)satisfaction. Virtual Analogue Scales (Heinberg & Thompson, 1995) were used to measure body dissatisfaction in six studies

(Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Fardouly & Rapee, 2019; Prichard et al., 2020; Tiggemann & Anderberg, 2020; McComb & Mills, 2021). The Body Image States Scale (Cash et al., 2002) was used to assess BI and body satisfaction in two studies (Brichacek et al., 2018; Dignard & Jarry, 2021). One study (Sampson et al., 2020) used the Body Satisfaction Scale (Slade et al., 1990) to measure body and facial dissatisfaction. Additionally, one study (Dignard & Jarry, 2021) also measured positive BI via the Body Appreciation Scale-2 (Tylka & Wood-Barcalow, 2015).

Side outcome

The State Appearance Comparison Scale (Tiggemann & McGill, 2004) was used by five studies (Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Fardouly & Rapee, 2019; Tiggemann & Anderberg, 2020; Dignard & Jarry, 2021) to measure appearance comparison.

The Basic Psychological Need Satisfaction Scale (Chen et al., 2014) was used in one study (Brichacek et al., 2018) to assess basic psychological needs satisfaction.

One study (Brown & Tiggemann, 2016) also included the Celebrity Attitude Scale (McCutcheon et al., 2002) to measure celebrity worship.

For evaluating self-esteem, one study (Dignard & Jarry, 2021) used The Rosenberg Self-Esteem Scale (Rosenberg, 1965) while another study (Tiggemann & Zaccardo, 2015) adopted the State Self-Esteem Scale (Heatherton & Polivy, 1991) for the same purpose.

For depression, the Beck-Depression Inventory 2 (Beck et al., 1996) was used by one study (Dignard & Jarry, 2021).

One study (McComb & Mills, 2021) adopted the Physical Appearance Perfectionism Scale (Yang & Stoeber, 2012) for the measurement of the perfectionism trait as well as the Cognitive Emotion Regulation Questionnaire (Garnefski & Kraaij, 2006) to measure the coping mechanisms of participants.

The Self-Discrepancy Index (Dittmar et al., 1996) to measure appearance discrepancy was used by another study (Sampson et al., 2020).

One study (Tiggemann & Anderberg, 2020) also measured muscular-ideal internalization with the Muscular Subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-4-Revised (Schaefer et al., 2017).

5.2.5. Study design

Of the nine studies included in the review, six were conducted and published in Australia (Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Brichacek et al., 2018; Fardouly & Rapee, 2019; Prichard et al., 2020; Tiggemann & Anderberg, 2020), two in Canada (Dignard & Jarry, 2021; McComb & Mills, 2021) and one in the United Kingdom (UK) (Sampson et al., 2020). All included studies were published in English between 2015 and 2021.

All studies had control groups, and the allocation to groups was performed randomly, as defined in the eligibility criteria.

Tables 3 and 4 give an overview of the characteristics, the main results and the key findings of the studies included, presented in alphabetical order. Further details regarding the individual studies can be found in chapter 5.5, while the results are synthetized in chapter 5.6.

Table 3: Overview of the included studies, presented according to the PICOS structure and in alphabetical order

Reference		Population	Intervention and Control	Outcome	Study Design
(Brichacek et al., 2018)	n (% F) Setting Age (M ± SD) BMI (kg/m^2) Ethnicity (%)	• N = 189 (75% F) • College students • Between 18 and 58 years old (M = 22.6, Mdn = 21.0, SD = 6.6) • BMI from 16.2 to 44.4 kg/m^2 (M = 23.9, Mdn = 22.8, SD = 5.1) • Ethnicity: Caucasian (71%), Asian (13%), Australian Aboriginal or Torres Strait Islander (5%), other ethnicities (7%)	1. Baseline measures questionnaire 2. Random group allocation 3. Exposure to stimulus: EG: 1 body-ideal photo CG: 1 travel photo 4. Post-exposure measures questionnaire 5. Debrief information and course credit	• 6-item Body Image States Scale (Cash et al., 2002) • 12 satisfaction items from Basic Psychological Need Satisfaction and Frustration Scale (Chen et al., 2014)	Between-subjects experimental design, RCT°
(Brown & Tiggemann, 2016)	n (%F) Setting Age (M ± SD) BMI (kg/m^2) Ethnicity (%)	• N = 138 (100% F) • College students • Between 18 and 30 years old • (M = 20.10, SD = 2.61) • BMI of M = 22.61 (SD = 4.35) • Ethnicity: Caucasian (77.4%)	1. Random group allocation 2. Social networking and baseline measures questionnaire 3. Exposure to stimulus: EG1: 15 celebrity images EG2: 15 peer images CG: 15 travel images 4. Post-exposure measures questionnaire 5. Manipulation check 6. Measurement of height and weight	• VAS for state mood (anxiety, depression, happiness, anger, confidence) and body dissatisfaction (weight dissatisfaction, appearance dissatisfaction, facial features dissatisfaction) (Heinberg & Thompson, 1995) • State Appearance Comparison Scale (Tiggemann & McGill, 2004) • Celebrity Attitude Scale (CAS) (McCutcheon et al., 2002)	Between-subjects experimental design, RCT°

Reference		Population	Intervention and Control	Outcome	Study Design
(Dignard & Jarry, 2021)	n (%F) Setting Age (M ± SD) BMI (kg/m^2) Ethnicity (%)	• N = 340 (100% F) • College students • Between 17 and 43 years old (M = 20.61, SD = 2.64) • BMI between 16.14 and 36.71 (M = 23.35 kg/m^2, SD = 4.34) • Ethnicity: Caucasian/European (77.7%), Arab (9.3%), African (6.6%), South Asian (5.4%), other (1%)	1. Baseline measure questionnaire 2. Random group allocation 3. Exposure to stimulus: EG1: 20 fitspiration images EG2: 20 thinspiration images CG: 20 travel images 4. Post-exposure measures questionnaire 5. Debrief information and course credit	• State Appearance Comparison Scale (Tiggemann & McGill, 2004) • Body Appreciation Scale-2 (BAS-2) (Tylka & Wood-Barcalow, 2015) • 6-item Body Image States Scale (Cash et al., 2002) • Beck Depression Inventory-Second Edition (BDI-II) • Rosenberg Self-Esteem Scale (RSES)	Between-subjects experimental design°, RCT°
(Fardouly & Rapee, 2019)	n (%F) Setting Age (M ± SD) BMI (kg/m^2) Ethnicity (%)	• N = 175 (100% F) • College students • Between 18 and 25 years old (M = 19.26; SD = 1.55) • BMI of M = 22.78 (SD = 4.35) • Ethnicity: Caucasian (56.57%), Asian (30.29%), Middle Eastern (8%), Other (5.14%)	1. Baseline measure questionnaire 2. Random group allocation 3. Exposure to stimulus: EG1: 3 no-makeup images EG2: 9 makeup images CG: 9 travel images 4. Post-exposure measures questionnaire 5. Demographic data questionnaire 6. Debrief information	• VAS for state mood (anxiety, depression, happiness, anger, confidence) and body dissatisfaction (weight dissatisfaction, appearance dissatisfaction, facial features dissatisfaction) (Heinberg & Thompson, 1995) • Self-Discrepancy Index (SDI) (Dittmar et al., 1996) • State Appearance Comparison Scale (Tiggemann & McGill, 2004)	Between-subjects experimental design, RCT°

Reference		Population	Intervention and Control	Outcome	Study Design
(McComb & Mills, 2021)	n (%F) Setting Age (M ± SD) BMI (kg/m^2) Ethnicity (%)	• N = 142 (100% F) • College students • Between 18 and 24 years old (M = 19.06; SD = 1.34) • BMI between 12.3 and 46.5 (M = 21.83, SD = 4.97) • Ethnicity: Caucasian (26.8%), South-Asian (22.5%), East-Asian (15.5%), Middle Eastern (13.4%), other ethnicities (21.8%)	1. Random group allocation 2. Baseline measure questionnaire 3. Exposure to stimulus: EG: 10 minutes browsing female models' images + complete body comparison questions CG: 10 minutes browsing landscape painting images + complete art critique questions 4. Post-exposure measures questionnaire 5. Measurement of height and weight 6. Debrief information	• VAS for state mood (confidence) and body dissatisfaction (weight dissatisfaction, appearance dissatisfaction, facial features dissatisfaction) (Heinberg & Thompson, 1995) • Physical Appearance Perfectionism Scale (PAPS) (Yang & Stoeber, 2012) • Cognitive Emotion Regulation Questionnaire (CERQ) (Garnefski & Kraaij, 2006)	Between-subjects experimental design, RCT°
(Prichard et al., 2020)	n (%F) Setting Age (M ± SD) BMI (kg/m^2) Ethnicity (%)	• N = 108 (100% F) • College students • Between 17 and 25 years (M = 20.24, SD = 1.86) • BMI of M = 23.02 (SD = 3.93). • Caucasian (64.8%), Asian (27.8%), other ethnicities (7.4%)	1. Baseline measure questionnaire 2. Random group allocation 3. Exposure to stimulus: EG1: 18 fitspiration images CG: 18 travel images 4. Play a game for 10 minutes 5. Post-exposure measures questionnaire 6. Measurement of height and weight 7. Debrief information	• VAS for state mood (confidence) and body dissatisfaction (weight dissatisfaction, appearance dissatisfaction, facial features dissatisfaction) (Heinberg & Thompson, 1995) • Exercise behaviour (distance travelled and perceived exertion on the treadmill) • Likert Scale on motivation to exercise/travel	Between-subjects experimental design, RCT°

Reference		Population	Intervention and Control	Outcome	Study Design
(Sampson et al., 2020)	n (%F) Setting Age (M ± SD) BMI (kg/m^2) Ethnicity (%)	• N = 132 (60.6% F) • College students • Between 18 and 35 years old (M = 20.5, SD 2.21) • Ethnicity: White (62.47%), Asian (25.8%), Mixed (11.3%), Black (3%) and Other (12.9%)	1. Baseline measure questionnaire 2. Random group allocation 3. Exposure to stimulus: EG: 5 minutes browsing attractive smile images CG: 5 minutes browsing nature images 4. Post-exposure measures questionnaire	• Body Satisfaction Scale (BSS), incl. Facial Satisfaction Scale (FSS) (Slade et al., 1990) • State Appearance Comparison Scale (Tiggemann & McGill, 2004) • Self-Discrepancy Index (SDI) (Dittmar et al., 1996)	RCT
(Tiggemann & Anderberg, 2020)	n (%F) Setting Age (M ± SD) BMI (kg/m^2) Ethnicity (%)	• N = 300 (0% F; 100% M) • People from TurkPrime platform • Between 18 and 30 years old (M = 24.94, SD = 2.96) • BMI of M = 26.01 (SD = 5.77) • Ethnicity: Caucasian/White (61.3%), African American (12.7%), Latino/Hispanic (11.7%), Asian (10.3 %), Native American (2%), other (2%).	1. Baseline measure questionnaire 2. Random group allocation 3. Exposure to stimulus: EG1: 14 fashion images EG2: 14 fitspiration images CG: 14 scenery images 4. Post-exposure measures questionnaire 5. Demographic questionnaire	• VAS for state mood (confidence) and body dissatisfaction (weight dissatisfaction, appearance dissatisfaction, facial features dissatisfaction) (Heinberg & Thompson, 1995) • State Appearance Comparison Scale (Tiggemann & McGill, 2004)	Between-subjects experimental design, RCT°

Reference		Population	Intervention and Control	Outcome	Study Design
(Tiggemann & Zaccardo, 2015)	n (%F) Setting Age (M ± SD) BMI (kg/m^2)	• N =130 (100% F) • College students • Between 17 and 30 years (M = 19.91, SD = 2.80) • BMI of M = 23.15 (SD = 4.86)	1. Random group allocation 2. Baseline measure questionnaire 3. Exposure to stimulus: EG: 18 fitspiration images CG: 18 travel images 4. Post-exposure measures questionnaire 5. Measurement of height and weight 6. Debrief information and course credit	VAS for state mood (confidence) and body dissatisfaction (weight dissatisfaction, appearance dissatisfaction, facial features dissatisfaction) (Heinberg & Thompson, 1995)	Between-subjects experimental design, RCT°

°Study design not stated in the article; however design was obtained by the reviewer.

5.3. Risk of bias within studies

The assessment of risk of bias, which was performed using the Risk of Bias Tool 2 (RoB2) published by Cochrane, is described in chapter 4.7.

An overview of the risk of bias for each study is presented in table 4.

Table 4: Risk of bias summary, studies presented in alphabetical order

Reference	D1	D2	D3	D4	D5	Overall
(Brichacek et al., 2018)	+	+	+	!	+	+
(Brown & Tiggemann, 2016)	+	+	+	!	+	+
(Dignard & Jarry, 2021)	+	+	+	!	+	+
(Fardouly & Rapee, 2019)	+	+	+	!	+	+
(McComb & Mills, 2021)	!	+	+	!	+	+
(Prichard et al., 2020)	+	+	+	!	+	+
(Sampson et al., 2020)	+	+	+	!	+	+
(Tiggemann & Anderberg, 2020)	+	+	+	!	+	+
(Tiggemann & Zaccardo, 2015)	+	+	+	!	+	+

Assessment with the RoB2 tool

Key: Low risk of bias (+), Some concerns (!), High Risk of Bias (-)

Randomization process (D1)

Overall, of the nine included studies, eight reported an adequate method for randomization, while one study (McComb & Mills, 2021) reported baseline differences in the groups and was thus considered to have a 'medium' risk of bias. Four studies mentioned the tool used for the randomization process, namely either 'Qualtrics' (Fardouly & Rapee, 2019; Prichard et al., 2020; Tiggemann & Anderberg, 2020) or 'Fluid Survey' (Dignard & Jarry, 2021). One study (Sampson et al., 2020) stated that randomization was done by computer with no mention of the software used, whereas the other four studies simply stated that participants were randomly allocated to the groups. However, by following the RoB2 tool, all studies but one (McComb & Mills, 2021) could be rated as low risk of bias for the first domain (Higgins et al., 2019).

Deviations from intended interventions (D1)

In all nine studies, the risk of bias for the second domain regarding deviations from the intended interventions was rated as low. This is due to the fact that no deviations from the intended intervention arose because of the trial context and because appropriate analyses were used to estimate the effects. One negative point for all nine studies was that participants were aware of the assigned intervention during the trial. However, this is inevitable for studies based on images, such as the included studies, and was thus not considered to be a risk of bias.

Missing outcome data

Regarding the third domain, targeting possible bias in the outcomes, a low risk of bias was detected in all studies. Data for the set outcome was available to all or to nearly all participants.

Measurement of the outcome

All studies were rated as being of 'medium' risk of bias in the fourth domain on the outcome measurement. While the method of measuring itself was not inappropriate, the assessors were aware of the intervention (signalling question 4.3), thus it is not possible to definitively say whether the outcome might have been influenced by the knowledge regarding the intervention received. Even though it is not likely, due to transparent reporting, that the outcome might have been influenced, all studies were rated by both the algorithm and the author as having 'some concerns'.

Selection of the reported result

All nine studies transparently displayed and planned the analyses before the unblinding of the outcome data. Additionally, although different scales or measurements were taken, all of the results were displayed in the studies and not only selected on the basis of the produced results. The data obtained was analysed and, in all studies, the results were published. Thus, here the risk of bias was also considered as being 'low'.

Overall

Overall, the author rated the studies as being of a low risk of bias. However, this result differs from the automatic result generated by the algorithm, which automatically rated the risk of bias as 'medium', as at least one domain was rated as such. This is due to the fact that, as

previously explained, the participants were aware of the intervention. However, due to the nature of these study designs and the research field, a blinding is not possible and for this reason, risk of bias was altered to low. For one study (McComb & Mills, 2021), which also had a medium risk of bias in domain 1, the risk of bias was rated as 'low' by the reviewer since the authors of the paper had taken appropriate measures to not let the bias affect the results. In the appendix, the full tables of the risk of bias assessment for all papers and domains including reasons for changes In the rating are shown.

5.4. Results of certainty assessment

Following the GRADE approach, all nine studies were initially rated as of high initial quality, as all studies were randomized controlled trials. Risk of bias was, as described in chapter 5.3., rated as low in all nine studies. Also, no inconsistency was observed in the studies and no direct publication bias could be detected either. However, consistency was graded down in all studies due to possible indirectness of evidence caused by differences in interventions (applicability). The studies had all the same set outcomes (body image and/or body (dis-)satisfaction, however, the interventions were delivered differently. Two studies concentrated on face images (Fardouly & Rapee, 2019; Sampson et al., 2020), whereas the other studies included images of entire bodies. While these criteria were set in advance (see chapter 4.1.2) and are therefore fitting with the aim of the review, these inconsistencies still have to be taken into consideration. For this reason, all studies in this review are rated to be of a moderate (+++) certainty of evidence (GRADE).

5.5. Results of individual studies

In this section, the nine included studies are presented in alphabetical order.

1. The effect of basic psychological needs and exposure to idealised Facebook images on university students' body satisfaction (Brichacek et al., 2018)

The study by Brichacek and colleagues, which was conducted in Australia (University of Canberra), examined the effect of viewing Facebook images on the body satisfaction of students. A total of 141 females and 48 males from the University of Canberra were asked to either view a body-ideal image of a person matching their ethnicity (experimental group) or a travel image on Facebook. The 6-item Body Image States Scale was used to measure body satisfaction. In addition, the Basic Psychological Need Satisfaction and Frustration

Scale (Chen et al., 2014) was used to measure the extent to which the basic psychological needs are currently met.

There was a significant difference between the two groups regarding body satisfaction after the exposure to the idealized images (d = -0.37). The participants of the experimental group had a significantly lower body satisfaction compared to the control group. Satisfaction of psychological needs did not protect against the negative effect of the images on body satisfaction in this particular study. Although the risk of bias was rated as low, an important point that must be taken into consideration in this study is that the participants were exposed to only one image. This procedure therefore does not directly mimic real social media usage, which must be seen as a limitation.

2. Attractive celebrity and peer images on Instagram: Effect on women's mood and body image (Brown & Tiggemann, 2016)

The study by Brown and Tiggemann was conducted in Australia, at the Flinders University, and had the aim of investigating the impact of attractive celebrity and peer Instagram images on women's BI. Participants (N = 138) were assigned to view either a set of celebrity images (experimental group one), or a set of unknown peer images (experimental group two) or a set of travel images (control group). Body (dis-)satisfaction and mood was measured with VAS (Heinberg & Thompson, 1995). The State Appearance Comparison Scale (Tiggemann & McGill, 2004) was used to examine the appearance comparison of participants. In addition, celebrity worship was measured with the Celebrity Attitude Scale (CAS) (McCutcheon et al., 2002). The results showed that exposure to both peer and celebrity images significantly increased negative mood and body dissatisfaction in comparison to the control group. However, no significant difference could be found in terms of impact between the celebrity and peer images on mood (d = 0.08) and body dissatisfaction (d < 0.01). State appearance comparison was correlated with post-exposure negative mood (r = .24, p < .001) and post-exposure body dissatisfaction (r = 0.44, p < .001), while celebrity worship moderated an increased effect of celebrity images on body dissatisfaction. The risk of bias was rated as low by the reviewer.

3. The "Little Red Riding Hood effect": Fitspiration is just as bad as thinspiration for women's body satisfaction (Dignard & Jarry, 2021)

The Canadian study by Dignard and Jarry had the goal of comparing the effects of fitspiration and thinspiration images on women's body satisfaction. A total of 331 female

undergraduate students were assigned to view a set of either fitspiration images (experimental group one), thinspiration images (experimental group two) or travel images (control group). Body (dis-) satisfaction and mood were measured with the BI States Scale (BISS), and positive BI was measured with the Body Appreciation Scale-2 (BAS-2). The State Appearance Comparison Scale (Tiggemann & McGill, 2004) was also used in addition to the Beck Depression Inventory 2 (Beck et al., 1996) and the Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965).

Viewing fitspiration (d = 0.57) and thinspiration (d = 0.40) images resulted in lower body satisfaction than viewing travel images. The test subjects also reported engaging in appearance comparison to a greater extent than those in the travel condition. However, these results were not statistically equivalent, and the fitspiration imagery was associated with lower body satisfaction than thinspiration. Interestingly, the fitspiration group also engaged in more appearance comparison than did the thinspiration group. In addition to these findings, the study describes that women who scored low in positive BI engaged in similar levels of appearance comparison, i.e. both for fitspiration and thinspiration images, whereas women high in body positivity engaged in more appearance comparison when viewing fitspiration than when viewing thinspiration imagery. The risk of bias was rated as low by the reviewer.

4. The impact of no-makeup selfies on young women's body image (Fardouly & Rapee, 2019)

Fardouly and Rapee of the Macquarie University (Sydney, Australia) examined the impact of viewing makeup and no-makeup selfies on women's BI and mood. A total of 175 female students were divided into three groups and had to look at pictures. The experimental group one viewed images of women with no makeup, the experimental group two viewed images of idealized women with makeup, and the control group viewed neutral travel images. Body (dis-)satisfaction and mood were measured with VAS (Heinberg & Thompson, 1995). The State Appearance Comparison Scale (Tiggemann & McGill, 2004) was used to examine the appearance comparison of participants. Additionally, appearance discrepancies related to the body and face were measured with the Self-Discrepancy Index.

Participants in the makeup condition were less satisfied with their facial appearance after exposure to the images (d = -0.40), whereas no change could be found in the no makeup and control conditions. Furthermore, participants in the makeup condition reported more face, hair, and skin discrepancies (d = -0.58) than those in the control condition. Regarding

appearance comparisons, no significant differences were found. Risk of bias was rated as low by the reviewer, however, the fact that the images used only showcased Caucasian women, thus representing only one ethnicity, should be taken into consideration when interpreting the findings.

5. Young women's body image following upwards comparison to Instagram models: The role of physical appearance perfectionism and cognitive emotion regulation (McComb & Mills, 2021)

The study by McComb and Mills from Canada examined the effect of seeing social media images paired with an appearance comparison task on the BI of students. A total of 142 female students were divided into two groups: an experimental group that received a stimulus consisting of Instagram model pictures and a control group that received Instagram landscape painting images. The experimental group was then asked to compare their body to the body of the model they had seen, while the control group was asked to perform an art critique exercise. VAS (Heinberg & Thompson, 1995) were used to measure the state of BI and confidence. In addition, perfectionism was measured with the Physical Appearance Perfectionism Scale (Yang & Stoeber, 2012) and the emotion-related thoughts were measured with the Cognitive Emotion Regulation Questionnaire (Garnefski & Kraaij, 2006). The results showed that the experimental group participants experienced an increase in weight dissatisfaction (d = 0.537) and in appearance dissatisfaction (d = 0.518). The experimental group also experienced a decrease in confidence (d = 0.507). People with medium to high levels of physical appearance perfectionism experienced higher levels of weight dissatisfaction after exposure to idealized images compared to participants with low appearance perfectionism. No impact of perfectionism could be observed in the control condition. One point of concern that should be highlighted is that there were baseline differences in terms of the level of appearance dissatisfaction (with the control group having a higher level of dissatisfaction than the experimental group). As the authors took appropriate and transparent measures to address this when analysing the data, the study was still rated as having a low risk of bias.

6. The effect of Instagram #fitspiration images on young women's mood, body image, and exercise behaviour (Prichard et al., 2020)

The study by Prichard (Flinders University, Australia) and colleagues examined the effects of viewing fitspiration images from Instagram on body dissatisfaction, mood, and exercise

behaviour among women. The study also analysed if exercise could act as a mediator to reduce negative effects from the image exposure. A total of 108 female students were assigned to a 2 (image type: fitspiration, travel inspiration) × 2 (activity type: exercise, quiet rest) between groups design. BI and mood were measured via VAS (Heinberg & Thompson, 1995). The exercise behaviour was measured with the distance travelled on a treadmill as well as with questions asking participants to rate the perceived level of exertion. Furthermore, participants were also asked to rate how inspired they had felt to either improve their fitness or to travel.

Exposure to fitspiration images led to significantly greater body dissatisfaction ($\eta^2 = 0.106$) and greater negative mood (partial $\eta^2 = 0.161$) among the participants. No difference was observed between the two groups in regard to the distance travelled on the treadmill. However, the perceived exertion during exercise was rated higher ($p = 0.15$) by a larger proportion of the participants in the experimental group (fitspiration imagery) than the participants in the control group (travel images). After the exercise and a quiet rest, the overall negative mood and body dissatisfaction decreased, but no differences were found between the fitspiration and the travel group. In this study, the risk of bias was also rated as low.

7. The effect of viewing idealised smile images versus nature images via social media on immediate facial satisfaction in young adults: A randomised controlled trial (Sampson et al., 2020)

Samson and colleagues from the King's College London examined the effect of Instagram images of smiling people on body, facial and smile dissatisfaction. A total of 132 male and female students were divided into two groups: an experimental group received idealized-smile images whereas the control group received neutral nature images. Body and facial dissatisfaction were measured using the Body Satisfaction Scale (BSS) (Slade et al., 1990) as well as the Facial Satisfaction Scale (FSS). Levels of comparison were measured with the State Appearance Comparison Scale (Tiggemann & McGill, 2004). For discrepancy, the Self-Discrepancy Index (Dittmar et al., 1996) was used. The results ($p < 0.05$) showed that exposure to idealized images increased facial (from 17.06 to 19.52), body (from 18.83 to 19.65) and total dissatisfaction (from 35.89 to 39.17), whereas the control group showed a declining trend. The risk of bias was rated as low.

8. Muscles and bare chests on Instagram: The effect of Influencers' fashion and fitspiration images on men's bod image (Tiggemann & Anderberg, 2020)

The study by Tiggemann and Anderberg (Flinders University, Australia) examined the effect of exposure to idealized Instagram images on men's body dissatisfaction. A total of 300 men were assigned to one of three groups. In experimental group one, participants were assigned to view images of clothed men; in experimental group two, participants were assigned to view fitspiration images (bare-chested men) and the control group was assigned to view images containing scenery. All of the images were taken from the same Instagram profiles. Body satisfaction as well as facial satisfaction were measured with (VAS) (Heinberg & Thompson, 1995). Appearance-based social comparison was measured with the State Appearance Comparison Scale (Tiggemann & McGill, 2004). Participants were also asked to rate the motivational effects of the viewed images as well as the overall attractiveness of the influencer on a VAS. In addition, the Muscular Subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-4-Revised (Schaefer et al., 2017) was used to assess the internalization of the muscular ideal.

The results showed that viewing fitspiration images resulted in significantly lower body satisfaction than viewing control images (partial $\eta^2 = 0.02$) or than viewing the clothed images (partial $\eta^2 = 0.03$). Additionally, viewing the images of the men (both clothed and bare-chested) resulted in higher motivation to exercise (partial $\eta^2 = 0.02$). Muscular-ideal internalization did not moderate the effect of image-type and the risk of bias was rated as low.

9. "Exercise to be fit, not skinny": The effect of fitspiration imagery on women's body image (Tiggemann & Zaccardo, 2015)

The Australian study by Tiggemann and Zaccardo aimed to examine the impact of fitspiration images on the BI of women. An overall group of 130 female students were assigned either an experimental group exposed to a set of Instagram fitspiration images or a control group exposed to a set of travel images. Body satisfaction and mood dissatisfaction were measured with VAS (Heinberg & Thompson, 1995). Appearance-based social and global comparisons were measured with the State Appearance Comparison Scale (Tiggemann & McGill, 2004) and with the Physical Appearance Comparison Scale (PACS). Additionally, the authors measured self-esteem by using the Self-Esteem Scale (SSES) and analysed the motivational effect of the images with a 7-point Likert scale. Participants viewing fitspiration images showed an increase in body dissatisfaction, whereas the control

group showed a decline in dissatisfaction ($p < 0.001$). The image type had a significant effect on negative mood (partial $\eta^2 = 0.206$) and on body dissatisfaction (partial $\eta^2 = 0.075$). Regarding inspiration, no significant effect of image type on the inspiration of the participants could be measured ($p = 0.366$). The exposure to fitspiration led to lower state appearance of self-esteem than exposure to control images. The motivational effect of the images was in line with the image seen: the experimental group experienced greater inspiration to improve exercise whereas the travelling group felt greater inspiration to travel. The effect of image type on state appearance comparison was also significant ($p < 0.001$, $d = 1.61$), while the risk of bias was rated as low.

Table 5: Results and key findings of the included studies (N = 9), presented in alphabetical order

Reference	Country	SM Channel	Randomization Process	Results	Key Findings
(Brichacek et al., 2018)	Australia	Facebook	Unequal randomization (4:1 experimental to control ratio)	• Significant between-group difference in post-exposure body satisfaction ($F(1,182) = 3.93$, $p = .049$, $d = -0.37$) • EG significantly lower body satisfaction ($M = 4.68$, $SD = 1.80$) than CG ($M = 5.07$, $SD = 1.45$), small effect (d: N/A) • Autonomy and competence small to moderate positive predictors of baseline body satisfaction ($R^2 = 0.42$, $F(5,181) = 28.29$, $p < 0.001$) • Psychological needs not protective against exposure to body-ideal imagery ($\Delta R^2 = 0.0$, $\Delta F(3,144) = 0.38$, $p = 0.765$)	• Exposure to body ideal image on Facebook resulted in lower body satisfaction among university students compared to exposure to travel image • Autonomy and competence positively predicted body satisfaction • Satisfaction of basic psychological needs did not protect against body dissatisfaction after exposure to the stimulus
(Brown & Tiggemann, 2016)	Australia	Instagram	Random allocation to one of three groups (EG1, EG2, CG), equal number per group	• Participants in EG1 and EG2 significantly greater body dissatisfaction ($F(1, 134) = 5.90$, $p < .02$, $\eta^2_p = 0.04$) and significantly greater negative mood ($F(1, 134) = 10.76$, $p < .001$, $\eta^2_p = 0.08$) • No significant difference between the celebrity and peer images on body dissatisfaction ($F(1,134) = 0.01$, $p = 0.94$, $d < 0.01$) and negative mood ($F(11,134) = 0.61$, $p = 0.44$, $d = 0.08$) • Participants who viewed celebrity and peer images engaged in more appearance comparison than participants who viewed travel images, ($t(135) = 7.42$, $p < 0.001$, $d = 1.28$), with no	• Exposure to celebrity and peer images increased body dissatisfaction and negative mood relative to travel images, with no significant difference between celebrity and peer images • State appearance comparison correlated both with post-exposure body satisfaction as well as negative mood • Celebrity worship moderated an increased effect of celebrity images on body dissatisfaction (high

Reference	Country	SM Channel	Randomization Process	Results	Key Findings
				difference between celebrity and peer conditions (t(135) = 0.67, p = 0.51, d = 0.12) • State appearance comparison was correlated with post-exposure body dissatisfaction (r = .44, p < 0.001) and post-exposure negative mood (r = .24, p < 0.001) • Celebrity worship explained significant additional variance in body dissatisfaction for EG1 (celebrity) ($\Delta R^2 = 0.01$, $\Delta F(1,132) = 4.98$, p = 0.03)	worship → image type made difference, in particular celebrity images)
(Dignard & Jarry, 2021)	Canada	Instagram	Random allocation with Fluid Survey's software. Images also shown in randomized order.	• Viewing fitspiration (t(145) = −3.43, p = 0.001, MΔ= −0.91, SE_Δ= 0.27, d = 0.57) and thinspiration (t(147) = −2.41, p =.014, MΔ = −0.67, SE_Δ= 0.27, d = 0.40) images resulted in lower body satisfaction than viewing travel images • Difference in reported state body satisfaction in the fitspiration and thinspiration conditions was not significant (t(152) = −0.92, p = .359, MΔ = −0.24, 95% CIΔ [−0.76, 0.28], d = 0.15) • Also, fitspiration (t(130.16) = 6.36, MΔ = 2.08, 95% CIΔ [1.43, 2.72],d = 1.05) and thinspiration (t(142.23) = 3.28, MΔ = 1.14, 95% CIΔ [0.45, 1.83], d = 0.54) groups reported engaging in appearance comparison to a greater extent than those in the travel condition • Viewing fitspiration was associated with greater state appearance comparison than was viewing travel images (F(1, 145)= 41.15, p < 0.001, $R^2 = 0.22$)	• Viewing fitspiration and thinspiration resulted in lower body satisfaction than did viewing travel images • Viewing thinspiration and fitspiration images resulted in more appearance comparison than viewing travel images • Women low in positive BI engaged in similar levels of appearance comparison, both for fitspiration and thinspiration images, whereas women high in body positivity engaged in more appearance comparison when viewing fitspiration than when viewing thinspiration imagery

Reference	Country	SM Channel	Randomization Process	Results	Key Findings
				• Viewing thinspiration was associated with greater state appearance comparison than was viewing travel images, ($F(1,147) = 10.77$ $p = 0.001$, $R^2 = 0.07$) • Viewing fitspiration was associated with greater state appearance comparison than was viewing thinspiration ($F(1, 152) = 9.60$, $p = 0.002$, $R^2 = 0.06$)	
(Fardouly & Rapee, 2019)	Australia	Instagram	Random allocation via Qualtrics survey's software. Images also shown in randomized order.	• Participants' facial appearance satisfaction decreased in the makeup only condition from pre- to post-exposure to the study images ($F(1, 172) = 16.44$, $p < 0.001$, $d = -0.40$) • No change in facial satisfaction over time for participants in EG2 ($F(1, 172) = 0.32$, $p = 0.57$, $d = -0.10$), or control condition ($F(1, 172) = 2.77$, $p = 0.10$, $d = -0.24$) • Makeup only condition reported more face, hair, and skin discrepancies ($d = -0.58$) than participants in the control condition • No significant differences in face, hair, and skin discrepancies between participants in the no-makeup and control conditions, or the makeup only and no-makeup conditions • No significant differences in the frequency of making appearance comparison ($F(1,129) = 0.03$, $p = 0.87$, $\eta^2_p < 0.001$), or the direction of comparisons made ($F(1, 129) = 0.08$, $p = 0.79$, $\eta^2_p = 0.001$) between EG1 and EG2 • No perceived difference in physical attractiveness for participants assigned to the EG1 or EG2 ($F(1, 129) = 0.76$, $p = .038$, $\eta^2_p = 0.01$)	• Participants in the makeup only condition were less satisfied with their facial appearance and were more motivated to change aspects of their face, hair, and skin after exposure to the study images. • No significant differences regarding appearance comparison found

Reference	Country	SM Channel	Randomization Process	Results	Key Findings
(McComb & Mills, 2021)	Canada	Instagram	Random allocation of participants prior to arrival at the lab (no detailed information)	• EG and CG differed in baseline levels of appearance dissatisfaction ($F(1,140) = 5.04$, $p = 0.03$), with CG reporting higher appearance dissatisfaction than those in the EG • EG experienced increases in both weight dissatisfaction ($t(71) = 4.56$, $p < 0.001$, $d = 0.537$), and appearance dissatisfaction ($t(71) = 4.39$, $p < 0.001$, $d = 0.518$) • CG experienced decreases in weight dissatisfaction ($t(69) = 2.77$, $p = 0.007$, $d = -0.333$, and appearance dissatisfaction ($t(69) = 3.67$, $p < 0.001$, $d = 0.438$) • EG experienced significant decreases in confidence ($t(71) = 4.30$, $p < 0.001$, $d = .507$) from Time1 to Time 2, while those in the CG experienced no statistically significant changes in confidence • Significant group differences in post-exposure weight dissatisfaction ($F(1, 139) = 24.94$, $p < 0.001$, $\eta^2_p = 0.152$), appearance dissatisfaction ($F(1, 139) = 26.15$, $p < 0.001$, $\eta^2_p = 0.158$), and confidence scores ($F(1, 139) = 12.56$, $p = 0.001$, $\eta^2_p = 0.083$) • Physical appearance perfectionism had no impact on post-exposure weight dissatisfaction scores in the CG. Those with medium or high levels of physical appearance perfectionism experienced greater amounts of weight dissatisfaction after exposure to thin ideal images, than those low on physical appearance perfectionism	• Upwards appearance comparison to thin ideal images in a social media environment increased weight and appearance dissatisfaction and reduced confidence, relative to baseline levels and to the CG • Moderate to high physical appearance perfectionism experienced greater weight and appearance dissatisfaction and less confidence than those low on physical appearance perfectionism

Reference	Country	SM Channel	Randomization Process	Results	Key Findings
				• Physical appearance perfectionism directly and positively related to weight dissatisfaction in all four tested models	
(Prichard et al., 2020)	Australia	Instagram	Random allocation via Qualtrics survey's software	• Exposure to the fitspiration images led to significantly greater body dissatisfaction ($F(1, 105) = 12.40$, $p = 0.001$, $\eta^2_p = 0.106$) and significantly greater negative mood ($F(1,105) = 20.09$, $p < .001$, $\eta^2_p = 0.161$) than CG • Greater proportion of CG rated their exercise exertion as low, compared to those from EG who were more likely to rate their exercise exertion as average or high ($X^2(2) = 8.44$, $N = 56$, $p = .015$)	• Exposure to fitspiration images led to significantly higher negative mood and body dissatisfaction when compared to exposure to travel images • There was no difference in actual exercise behaviour according to image type. However, participants who exercised following exposure to fitspiration images were significantly more likely to report higher subjective exertion ratings
(Sampson et al., 2020)	UK	Instagram	Random allocation by simple computerized list randomisation	• All the dissatisfaction scores (BSS, FSS and total scores) increased in the post-exposure period for the experimental group whereas for the control group it showed a declining trend • Exposure to 'ideal' facial images on social media significantly decreases facial satisfaction (95% CI = 0.85–1.05; P < 0.0001) • No significant increase in body dissatisfaction • Individuals with high baseline self-discrepancy scores are less satisfied with their facial features and body appearance (95% CI = 0.04–1.16; P = 0.036)	• Exposure to 'ideal' facial images on social media decreases facial satisfaction • Individuals with high baseline self-discrepancy scores are less satisfied with their facial features and body appearance
(Tiggemann &	Australia	Instagram	Random allocation via	• EG1 did not result in significantly lower body satisfaction ($F(1, 280) = 0.04$, $p = 0.845$, $\eta^2_p = 0.00$) when compared to the CG	• Exposure to bare-chested and muscular images resulted in significantly lower body

Reference	Country	SM Channel	Randomization Process	Results	Key Findings
Anderberg, 2020)			Qualtrics survey's software	• EG2 had, compared with the CG, a significantly lower body satisfaction ($F(1, 280) = 6.18$, $p = 0.014$, $\eta^2_p = 0.02$) • EG2 also significantly lower body satisfaction when compared to EG1 ($F(1, 186) = 5.23$, $p = 0.023$, $\eta^2_p = 0.03$) • No significant results in the comparisons regarding facial satisfaction • Little difference in overall appearance comparison ($t(187) = 0.20$, $p = 0.844$, $d = 0.03$) • Significant difference between groups on the specific measure of facial comparison ($t(187) = 3.26$, $p = 0.001$, $d = 0.47$), men in the fitspiration condition (EG29 reported less facial comparison than men in the fashion condition (EG1). The difference for physique comparison was not significant ($t(187) = 0.51$, $p = .608$, $d = 0.07$) • Muscular-ideal internalization did not moderate the effect of image type	satisfaction relative to viewing clothed fashion images or scenery images, which did not differ from each other • The clothed and bare-chested conditions did not differ in amount of appearance-based social comparison, nor in reported inspiration to exercise or eat healthily
(Tiggemann & Zaccardo, 2015)	Australia	Instagram	Random allocation of participants (no detailed information)	• Participants in EG images showed an increase in mood and body satisfaction from pre- to post-exposure, while CG showed a slight decrease • Effect of image type on body dissatisfaction ($F(1, 127) = 10.32$, $p < 0.001$, $\eta^2_p = 0.075$) as well as on mood ($F(1, 127) = 32.86$, $p < 0.001$, $\eta^2_p = 0.206$) was significant • Significant difference between groups in appearance self-esteem ($t(128) = 2.08$, $p = 0.04$, $d = 0.36$)	• Acute exposure to fitspiration images led to increased negative mood and body dissatisfaction and decreased state appearance self-esteem relative to travel images • Regression analyses showed that the effects of image type were mediated by state appearance comparison

Reference	Country	SM Channel	Randomization Process	Results	Key Findings
				• Participants of EG felt significantly greater inspiration to improve their fitness ($t(128) = 7.82$, $p < 0.001$, $d = 1.38$) and to eat healthily ($t(128) = 7.40$, $p < 0.001$, $d = 1.45$) • Participants of EG showed greater state appearance comparison than CG. Effect of image type on state appearance comparison was significant ($t(128) = 6.42$, $p < 0.001$, $d = 1.61$) • Significant indirect effect through appearance comparison on all of post-exposure negative mood, $b = 0.127$, CI [0.043, .0241], body dissatisfaction, $b = 0.296$, CI [0.184, 0.433], and appearance self-esteem, $b = -0.280$, CI [−0.410, −0.174]	

5.6. Synthesis of results

5.6.1. Body and appearance (dis-)satisfaction

Associations between exposure to social media images and BI and/or body (dis-)satisfaction was examined in all studies.

Seeing idealized images on social media was associated with higher body dissatisfaction or lower body satisfaction in both female (Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Brichacek et al., 2018; Fardouly & Rapee, 2019; Prichard et al., 2020; Dignard & Jarry, 2021; McComb & Mills, 2021), male (Tiggemann & Anderberg, 2020) and mixed cohorts (Sampson et al., 2020). This effect could be detected both on Facebook (Brichacek et al., 2018) and on Instagram (Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Fardouly & Rapee, 2019; Prichard et al., 2020; Sampson et al., 2020; Tiggemann & Anderberg, 2020; Dignard & Jarry, 2021; McComb & Mills, 2021).

The image-related exposures could be categorized as: non-specific body-ideal images (Brichacek et al., 2018; McComb & Mills, 2021), celebrity images (Brown & Tiggemann, 2016), peer images (Brown & Tiggemann, 2016), fitspiration images (Tiggemann & Zaccardo, 2015; Prichard et al., 2020; Tiggemann & Anderberg, 2020; Dignard & Jarry, 2021), thinspiration images (Dignard & Jarry, 2021), fashion images (Tiggemann & Anderberg, 2020), makeup and no-makeup images (Fardouly & Rapee, 2019), or attractive smile images (Brown & Tiggemann, 2016).

The studies on exposure to non-specific body-ideal images both reported significantly higher body dissatisfaction in the experimental groups (people viewing the body-ideal images) when compared with the control group (Brichacek et al., 2018; McComb & Mills, 2021).

In terms of celebrity and peer images (Brown & Tiggemann, 2016), both types of images were shown to impact BI by increasing body dissatisfaction when compared to neutral travel images, and no significant differences between the two types of images (i.e. celebrity and peer) could be found.

Similar findings were shown in studies regarding fitspiration: viewing fitspiration images resulted in lower body satisfaction than viewing travel images (Tiggemann & Zaccardo, 2015; Prichard et al., 2020; Tiggemann & Anderberg, 2020; Dignard & Jarry, 2021). Fitspiration images were also found to significantly lower body satisfaction when compared to fashion images, which, on the contrary, did not significantly lower body satisfaction when compared to both travel and fitspiration images (Tiggemann & Anderberg, 2020). Thinspiration images also resulted in lower body satisfaction when compared to travel

images, and no differences in body satisfaction could be found between thinspiration and fitspiration images (Dignard & Jarry, 2021).
Viewing images of women wearing makeup also resulted in decreased facial appearance satisfaction, whereas viewing images of women without makeup did not result in decreased satisfaction when compared to the control group (Fardouly & Rapee, 2019).
Regarding the study involving smile images, a distinction in terms of the results should be made. In this case, the group exposed to ideal smile images experienced a significant decrease in facial satisfaction, but their body dissatisfaction did not increase (Sampson et al., 2020).

A person's mood is closely related to satisfaction or dissatisfaction with their body. Three studies (Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Prichard et al., 2020) examined the effect of viewing social media images on mood.
Viewing peer and celebrity images significantly increased negative mood compared to viewing travel images, with no significant differences between peer and celebrity groups in terms of impact (Brown & Tiggemann, 2016). In females, fitspiration images also led to a significantly greater negative mood than control images (Tiggemann & Zaccardo, 2015; Prichard et al., 2020).

5.6.2. Possible moderators and/or factors regarding the impact of social media on body image and appearance (dis-)satisfaction

Appearance comparison was measured in five studies (Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Fardouly & Rapee, 2019; Tiggemann & Anderberg, 2020; Dignard & Jarry, 2021). It was shown that people who viewed celebrity and peer images engaged in more appearance comparison than people who viewed neutral travel images, and state appearance comparison was also positively correlated with post-exposure body dissatisfaction and negative mood (Brown & Tiggemann, 2016). In two studies, viewing fitspiration images was associated with a greater state appearance comparison than control images (Tiggemann & Zaccardo, 2015; Dignard & Jarry, 2021), whereas in another study, fitspiration did not lead to more appearance comparison (Tiggemann & Anderberg, 2020). While thinspiration was also associated with a greater appearance comparison, viewing fitspiration led to a greater appearance comparison than thinspiration (Dignard & Jarry, 2021), whereas viewing fashion images led to more facial comparison than fitspiration images (Tiggemann & Anderberg, 2020).

No significant differences in state appearance comparison were found in participants viewing makeup and no makeup images (Fardouly & Rapee, 2019). Additionally, one study confirmed that the effect of image type (in the case fitspiration vs. control) on state appearance comparison was significant and that state appearance comparison was significantly related to post-exposure body dissatisfaction, mood, and appearance self-esteem (Tiggemann & Zaccardo, 2015).

Regarding basic psychological needs, the results analysed showed that satisfaction of the basic needs did not protect against post-exposure body dissatisfaction (Brichacek et al., 2018). Celebrity worship moderated an increased effect of celebrity images on body dissatisfaction, but not on mood: when worship was high, the image type had a large effect on the body dissatisfaction and, in particular, celebrity images had the greatest (negative) effect in this context (Brown & Tiggemann, 2016). When celebrity worship was low, image type had little effect on the body dissatisfaction (Brown & Tiggemann, 2016). Exposure to fitspiration images also led to a lower state appearance self-esteem than control travel images (Tiggemann & Zaccardo, 2015). Perfectionism was also analysed by one study, which showed that participants who had medium to high levels of physical appearance perfectionism experienced higher levels of body dissatisfaction after viewing thin-ideal images (McComb & Mills, 2021). Furthermore, only participants who viewed the makeup pictures reported more face, hair and skin discrepancies when compared to the control condition, whereas the no makeup pictures did not result in more discrepancies (Fardouly & Rapee, 2019). The muscular-ideal internalization also did not moderate the effect of image type (Tiggemann & Anderberg, 2020).

6. Discussion

A discussion of the methods and results is presented below. In the discussion of the methods, the strengths as well as the limitations of the survey are reflected. In the discussion of the results, the results presented in chapter 5 are reflected and discussed in more detail. Lastly, recommendations for practice and future research are provided.

6.1 Discussion of methods

The chosen eligibility criteria were set in line with other existing reviews in the field (Holland & Tiggemann, 2016; Rounsefell et al., 2020). For the population, the chosen criteria allowed the possibility to include a large variety of studies, and the decision to exclude people with a previous or current eating disorder can be seen as a strength of the methodology, as it reduces biases in the results. Furthermore, the formulation of very clear intervention criteria allowed for a transparent and straightforward process, while the inclusion of only randomized controlled trials as well as the decision to include only studies with a between-subject design augmented the quality of this review.

However, some limitations in the eligibility criteria should also be mentioned. In the intervention, studies in which comments, likes or captions were the focus were excluded. These elements are also an important part of the user's experience on the platforms, and thus they may play an important role by themselves and could generate different or stronger results. Another limitation is that the intervention had to be administered in one sitting or on one day, while social media usage is characterized by being a repeated and continuous action, and these effects might not be adequately reproduced with short exposures such as those in the studies presented. Due to the fact that only studies published in English were included, it is also possible that relevant studies were published in other languages, which were not considered in the current review.

An extensive literature search was performed on the most important databases, namely PubMed, Scopus, and Cochrane (only including Embase and CINHAHL). The selected databases were chosen as they often have access to several different sources and can therefore deliver additional results, thus allowing a very detailed and extensive search which adds value to the review. This should be considered a strength of this review. However, additional databases, such as PsychInfo, were not used upon agreement with the supervisor

due to time limitations, and this might have led to some citations being missed. Also, as described in chapter 4.1., only studies in English were gathered. However, this might have led to the missing of important studies, especially from countries where English is not the main language in research. In countries such as China, research is largely published in Chinese and not in English (Jinxiu, 2004). However, China is the world's largest social media market with highly engaged users and it is highly possible that experimental research regarding social media and body image has been carried out, but is missing in this review due to the language barrier.

The chosen search strategy included the use of Boolean operators as well as MeSH terms, which allowed for a very extensive search. An additional strength of this review is that the search terms were chosen from other important papers in the field (Holland & Tiggemann, 2016; Rounsefell et al., 2020) and adapted. However, a limitation of the chosen search strategy is that only one person developed and ran the search, which means that potential synonyms might have been overlooked.

A strength of the performed selection process was the use of the Rayyan software. The software ensures a higher level of transparency of the process, as the results can be checked at any time by logging into the software. Furthermore, the use of the Rayyan software helped in the structurization of the selection process, thereby compensating to some extent for the fact that the review was not conducted by a team. The fact of having only one reviewer in the selection process can also be regarded as being the biggest limitation of this review, as it might augment the risk for selection bias or for errors in the methodology.

The data collection process was performed using a data extraction template developed by the author of this study. The biggest limitation in the data collection process is, again, the fact that the process was performed by one researcher only, which might have led to biases. However, a strength of the data collection in this review is that the reviewer repeated data extraction of the full-text articles twice with five days of pause in-between in order to reduce the possibility of data extraction mistakes. This allowed for the evaluation of the chosen data items in the extraction template and for amendments to be made to increase the quality.

The tool used for the risk of bias assessment was the well-known RoB2 by Cochrane, which is a strength of this review. It should be mentioned that the domain 'blinding' was rated as

unclear in all nine studies, which is due to the fact that blinding is challenging and almost impossible in interventions where clear images, such as in the interventions carried out in these studies, are shown to the study participants. This might be viewed as a limitation of the assessment tool used, as it is was primarily developed for randomized controlled trials in the clinical sector and is thus mainly targeted at interventions such as medical trials where blinding is possible and does not exclusively target other types of interventions, such as digital ones. The development of a risk of bias tool mainly for social media could be an enrichment for this research area.

Also, the used GRADE approach to assess the certainty of evidence is in line with the recommendations of leading institutions (The Cochrane Collaboration, 2021a).

The defined effect measures were in line with the literature and enabled a correct and high qualitative measurement of the defined outcomes.

6.2. Discussion of results

Nine randomized controlled trials that evaluate the effects of social media images on the BI and body (dis-)satisfaction of users were found. These studies were published in the past six years (2015–2021) and all studies were conducted in English-speaking countries: Australia (N = 6), Canada (N = 2) and the UK (N = 1).

This review aimed to gather the current evidence regarding social media images and BI and appearance (dis-)satisfaction, to examine which effects viewing social media images has on the BI and appearance (dis-)satisfaction of its users. Additionally, as a side outcome, the review aimed at understanding possible mediating and influencing factors on these effects.

The nine studies analysed helped to shed further light on the topic of interest.

As the studies are all rated with a low risk of bias and a moderate level of certainty of the evidence, the author is moderately confident in the effect estimate stated by the studies, meaning that the true effect is likely to be close to the estimate of the effect stated in the results of the individual studies. However, since level is moderate and not high, there is a possibility for the true effect to be different from the estimate effect.

Considered together, the findings suggest that, in both women and men, the exposure to body-related or body-ideal images were associated with higher rates of body and appearance

dissatisfaction and a negative BI. These findings were consistent across different types of images used for interventions, namely fitspiration, thinspiration, fashion images, smile images and makeup images. This aligns with observational studies and reviews exploring social media, BI and food choices (Holland & Tiggemann, 2016; Rounsefell et al., 2020). In fact, these findings also correlate with research on traditional and mass media, where negative effects on BI were also observed, even prior to the advent of social media (Thompson et al., 1999; Groesz et al., 2002; van den Berg et al., 2002; Grabe et al., 2008). However, due to the more interactive and personalized features of social media, the effects might be more pronounced (Fardouly & Vartanian, 2016).

The included studies also showed that, in most cases, people exposed to idealized images engaged in social comparisons. The theory of social comparison suggests that people have an innate drive to compare themselves with other people in order to be able to make evaluations of themselves. However, social comparison seems to be stronger when the compared subject is considered similar to oneself (Festinger, 1954). Social media transmit a stronger feeling of intimacy, as peers and celebrities are presented on the same platform and share private moments of their everyday lives. While traditional celebrities such as football players are idealized, but seen as different, social media celebrities are trusted more because they are seen as familiar people (Berryman & Kavka, 2017; Jankowski, 2021).

The included studies are consistent with the social comparison theory as, in most cases, the participants who viewed the idealized-BIs were comparing themselves more than the participants in the control groups (Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Tiggemann & Anderberg, 2020; Dignard & Jarry, 2021). However, one study including makeup vs. no makeup images did not register greater social comparison scores (Fardouly & Rapee, 2019). While there is no clear explanation for this outcome, it could be possible that this result derives from the fact that makeup is not a permanent physical trait of a person, but only a temporary feature. People, and in this case, users and viewers, are aware of the fact that makeup is not part of the real body or facial aspect of a person and might therefore be able to distance themselves more. Makeup is also something that is widely available and easily accessible (both the makeup tools and the techniques which can be learned easily), thus anyone can copy a look. Although no detailed information was provided about the participants, it could be possible that they were simply generally not interested in makeup, and thus had less of an urge to compare themselves.

Thus, social comparison should be seen as a risk factor for increasing comparison, which can lead to a low BI and higher body dissatisfaction and preventive measures should be

adopted to help users to better understand how the images presented on social media should be viewed and evaluated. For example, self-worth and satisfaction for the own capabilities could be put more into focus in schools, in order to help adolescents and young adults to shield certain information retrieved on the internet.

Social comparison should also be viewed in combination with body discrepancies (Anton et al., 2000). If a person is already dissatisfied with their body and has more body discrepancies, comparison might be even more detrimental since the object of comparison is external. As with social media, the external object of comparison is more similar to the own self, this detrimental effect might be amplified. Other studies showed that discrepancies between the actual and ideal BIs are associated with maladaptive eating and exercise patterns. Thus, discrepancies also should be seen as a risk factor and should be addressed. Again, as with social comparison, raising the own self-worth and perception of the own capabilities might be helpful in order to diminish discrepancies as a whole. Following the Tripartite influence model (Thompson et al., 1999), the role of parents should not be forgotten in this field. In fact, body discrepancies might already start at home, with parents having some expectations towards the body or capabilities of the children. When the children are not able to meet the expectations, discrepancies start to develop. Parents should be made aware that they can strongly influence the behavior of the own children from a very young age and should be taught coping and educational strategies to make better decisions that have a weaker impact on the future mental health of the children.

Some studies have shown that maladaptive perfectionism impacts BI satisfaction and disordered eating through negative self-evaluations (Barnett & Sharp, 2016). While this was not the focus of this review, one study analysed did confirm this impact. In fact, the study showed that medium to high levels of perfectionism led to a higher body dissatisfaction after viewing thin-ideal images than the control group (McComb & Mills, 2021). Thus, taken together with social comparison, maladaptive perfectionism might play a detrimental role in the development of a healthy BI. In order to address this issue, more adaptive and positive forms of perfectionism could be promoted and stimulated in perfectionism-prone children and adolescents from a very young age, in order to prevent a negative and maladaptive development. Self-compassion, self-kindness and self-judgement could be addressed in order to create a more patient and understanding view of oneself, which might help in reducing the negative impact of social media images (Barnett & Sharp, 2016).

Overall, BI plays a fundamental role in the physical and mental health of people. Previous literature indicated that appearance and body dissatisfaction are associated with the risk of maintaining and/or developing an eating disorder and adopting a lower quality diet (Neumark-Sztainer et al., 2006; Hart et al., 2015). The findings of this review show that effects and associations that were already largely present in traditional media are also present in social media. Therefore, the impact of social media on the physical and mental health of its users should be further analysed to assess the severity of the problem.

The included studies are experimental studies and can therefore evaluate the impact of the actual use of the media. Observational studies, on the other hand, rely on memory and thus might be more prone to recalling bias.

Some limitations in the presented results should also be highlighted. Overall, the majority of the participants of the studies included in this review defined themselves as being 'Caucasian' or 'white'. However, as it is also well known from the literature, BI is highly influenced by society and customs (Cash & Pruzinsky, 2002; van den Berg et al., 2002) and social media content can vary greatly depending on the region it is created and consumed in. The presented results should therefore be seen as results portraying the 'Western' world. As already described in chapter 6.1., possible studies and results from China and, in general, the 'Eastern' world might be missing. Therefore, the here presented results should strictly be seen as connected to the 'Western' world and no generalizations should be done.

Furthermore, although real social media images were used, it should be remembered that the way these studies were carried out does not replicate a real social media usage setting. Social media is very complex, with algorithms created to purposely personalize the user experience (Instagram, 2021). Thus, viewing and 'scrolling' images on social media develops a completely individualised and largely unforeseeable dynamic that cannot easily be replicated in the lab or via online surveys. Images and content are presented according to the individual user's preferences, creating a tailor-made experience aiming at keeping the user engaged with the platform (Kalyanaraman & Sundar, 2006; Andersson, 2018)., which might impact the viewer even more than what lab settings can detect.

6.3. Recommendations for practice and future research

Implications for practice

The results of this review are in line with results from previous observational analyses in the field (Rounsefell et al., 2020) as well as past research on mass media (Grabe et al., 2008). The findings support the hypothesis that exposure to body-ideal media images is related to BI concerns. Prevention in this field is thus greatly needed. Self-Efficacy (Bandura, 1977), a high self-esteem, and the capability to regulate emotions can all play an important role in the prevention of BI concerns. Thus, following the tripartite influence model (van den Berg et al., 2002), a positive environment with supportive parents and peers as well as preventive measures on social media are needed in order to reinforce a positive BI ideal. These could already be implemented at school, where children and adolescents are most vulnerable.

Additionally, more attention should be given to media literacy. In the context of traditional media, studies could show that media literacy intervention can limit the effects of media on BI by reducing, for example, the internalization of socio-cultural ideas (Yamamiya et al., 2005; Watson & Vaughn, 2006).

Even though changes should occur both at the individual as well as on a societal level, one recommendation for practice, and for policymakers in particular, is to ban or limit images that glorify an unhealthy BI. Many platforms have already banned specific hashtags (Huffpost, 2012), and newer regulations such as those in the platform Pinterest, have completely banned weight-related advertisements (Sicurella, 2021). However, stronger regulations and bans should be planned and implemented, especially in regard to content creators and influencers. Being composed by many different aspects, BI measures should always address multiple components, such as the satisfaction and dissatisfaction, the self-awareness and also the beliefs, ideas and behaviours regarding the individual's appearance (Cash & Smolak, 2012).

Implications for research

The evidence available for this review was very limited in terms of quantity when compared to the amount of evidence available from observational studies (Rounsefell et al., 2020). Further high-quality studies are needed that investigate the impacts of social media usage on BI in an experimental way.

Overall, of the nine included studies, the majority (> 50%) of the participants in each study was of 'Caucasian'/white ethnicity and Asian. In one study, ethnicity was not described

(Tiggemann & Zaccardo, 2015). However, it is known that BI ideals are very culture-specific (Parker, 2009), and thus more studies including other ethnicities as well as other 'stimulus images' with different ethnicities should be conducted. Another element that should be included in future studies is more diversity in terms of gender and age: in all nine studies, the participants were young adults, and mostly females. However, special attention should also be given to children and adolescents (since their level of usage of social media is very high [Ofcom, 2018]), as well as to men and gender diverse people.

Additionally, when looking at social media platforms, only Instagram and Facebook were analysed in the included studies. However, platforms such as TikTok and YouTube (Perez, 2018) are becoming increasingly popular and should therefore also be included in future experimental studies. Furthermore, video-content such as 'Reels', 'Stories' or 'IGTV-Videos', which are increasingly becoming core elements of platforms such as Instagram (Mosseri, 2021), should also be considered in future research. Additional BI-related trends, other than fitspiration and thinspiration, could also be analysed in terms of their impact.

Interestingly, the number of institutions researching the topic was surprisingly limited in that they were only from Australia, Canada and the UK, and, additionally, three of the studies (Tiggemann & Zaccardo, 2015; Brown & Tiggemann, 2016; Tiggemann & Anderberg, 2020) were also published by the same research group from an Australian university. In future, other countries should also engage in similar research and analyse these impacts in their regions as well. It would also be very important to perform a review of the evidence in the eastern part of the world, analysing research performed in this area in countries such as China. Comparisons across the countries and, if possible, international trials, should be planned in order to investigate in more depth this topic of growing interest.

In regard to the type of intervention, research would benefit from more realistic interventions which better mimic the real usage of social media, including the personalization of contents, the addictive factors and the algorithms.

Lastly, further research would benefit from a more consistent use of the same measures and tools needed to measure outcomes. The review shows that there are no clear procedures for the measurement of BI and body dissatisfaction, and this makes comparison difficult.

7. Conclusion

The goal of this review was to gather the current evidence regarding social media images and BI and appearance (dis-)satisfaction,

> to examine what impact viewing social media images has on the BI and appearance (dis-)satisfaction of its users
>
> > to gain insights on the possible health impacts that social media has, and to make recommendations to policymakers and for future studies in the field.

In addition, possible factors and/or moderators regarding the impact of social media images on BI were collected (side goal).

Taken together, the findings from the analysis of the nine included studies suggest that exposure to social media images, including specific trends such as thinspiration and fitspiration images could have a negative impact on BI as well as on body satisfaction. Being exposed to and viewing idealized images as well as engaging in appearance comparisons might increase risks connected to a negative BI.

These effects appear robust and could be found in all the analysed studies, which adopted different types of measures and assessment tools. Further research is needed to provide additional evidence on the role of social media images in the BI and appearance (dis-)satisfaction of its users. A particular focus should be placed on longitudinal and prospective studies, also including other ethnicities and genders as well as standardized measures and tools. This is needed in order to provide social media providers and policymakers as well as schools and parents with the evidence needed to act and prevent the related risks.

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References

1. Alberga, A. S., Withnell, S. J., & von Ranson, K. M. (2018). Fitspiration and thinspiration: A comparison across three social networking sites. *Journal of Eating Disorders*, *6*(1), 39. https://doi.org/10.1186/s40337-018-0227-x
2. Andersson, H. (2018, July 3). Social media apps are "deliberately" addictive to users. *BBC News*. https://www.bbc.com/news/technology-44640959. Accessed 2021, July 20th
3. Anton, S. D., Perri, M. G., & Riley, J. R. (2000). Discrepancy between actual and ideal body images: Impact on eating and exercise behaviors. *Eating Behaviors*, *1*(2), 153–160. https://doi.org/10.1016/S1471-0153(00)00015-5
4. Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215. https://doi.org/10.1037/0033-295X.84.2.191
5. Barnett, M., & Sharp, K. (2016). Maladaptive perfectionism, body image satisfaction, and disordered eating behaviors among U.S. college women: The mediating role of self-compassion. *Personality and Individual Differences*, *99*, 225–234. https://doi.org/10.1016/j.paid.2016.05.004
6. Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. (1996). Comparison of Beck Depression Inventories -IA and -II in psychiatric outpatients. *Journal of Personality Assessment*, *67*(3), 588–597. https://doi.org/10.1207/s15327752jpa6703_13
7. Berryman, R., & Kavka, M. (2017). 'I Guess A Lot of People See Me as a Big Sister or a Friend': The role of intimacy in the celebrification of beauty vloggers. *Journal of Gender Studies*, *26*(3), 307–320. https://doi.org/10.1080/09589236.2017.1288611
8. Boyd, J. (2021, July 5). *The Top 20 Most Followed Accounts on Instagram*. Brandwatch. https://www.brandwatch.com/blog/top-most-instagram-followers/
9. Brenner, W., & Lemke, C. (2020, September 29). *Internet*. Enzyklopädie Der Wirtschaftsinformatik, Online-Lexikon. https://www.enzyklopaedie-der-wirtschaftsinformatik.de/wi-enzyklopaedie/lexikon/technologien-methoden/Rechnernetz/Internet/
10. Brichacek, A., Neill, J., & Murray, K. (2018). The effect of basic psychological

needs and exposure to idealised Facebook images on university students' body satisfaction. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *12*(3). https://doi.org/10.5817/CP2018-3-2

11. Brown, Z., & Tiggemann, M. (2016). Attractive celebrity and peer images on Instagram: Effect on women's mood and body image. *Body Image*, *19*, 37–43. https://doi.org/10.1016/j.bodyim.2016.08.007
12. Carrotte, E. R., Prichard, I., & Lim, M. S. C. (2017). "Fitspiration" on Social Media: A Content Analysis of Gendered Images. *Journal of Medical Internet Research*, *19*(3), e95. https://doi.org/10.2196/jmir.6368
13. Cash, T.F. (2012). Cognitive-behavioral perspectives on body image. In *Encyclopedia of Body Image and Human Appearance—1st Edition* (Vol. 1, pp. 334–342). Academic Press. https://www.elsevier.com/books/encyclopedia-of-body-image-and-human-appearance/cash/978-0-12-384925-0
14. Cash, T.F., Fleming, E. C., Alindogan, J., Steadman, L., & Whitehead, A. (2002). Beyond body image as a trait: The development and validation of the Body Image States Scale. *Eating Disorders*, *10*(2), 103–113. https://doi.org/10.1080/10640260290081678
15. Cash, T.F., & Pruzinsky, T. (Eds.). (2002). *Body image: A handbook of theory, research, and clinical practice*. Guilford Press.
16. Cash, T.F., & Smolak, L. (Eds.). (2012). *Body Image: Second Edition: A Handbook of Science, Practice, and Prevention*. Guilford Press. https://www.guilford.com/books/Body-Image/Cash-Smolak/9781462509584/contents
17. CERN. (2021). *A short history of the Web*. CERN. https://home.cern/science/computing/birth-web/short-history-web. Accessed 2021, June 10th
18. Chancellor, S., Pater, J. A., Clear, T., Gilbert, E., & De Choudhury, M. (2016). #thyghgapp: Instagram Content Moderation and Lexical Variation in Pro-Eating Disorder Communities. *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing*, 1201–1213. https://doi.org/10.1145/2818048.2819963
19. Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E., van der Kaap-Deeder, J., Duriez, B., Lens, W., Matos, L., Mouratidis, T., Ryan, R., Sheldon, K., Soenens, B., Van Petegem, S., & Verstuyf, J. (2014). Basic psychological need

satisfaction, need frustration, and need strength across four cultures. *Motivation and Emotion, 39*, 216–236. https://doi.org/10.1007/s11031-014-9450-1

20. Cochrane Deutschland Stiftung, Institut für Evidenz in der Medizin, Institut für Medizinische Biometrie und Statistik, Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften- Institut für Medizinisches Wissensmanagement, & Ärztliches Zentrum für Qualität in der Medizin. (2020). *Manual systematische Recherche für Evidenzsynthesen und Leitlinien*. https://doi.org/10.6094/UNIFR/174468
21. Cohen, R., Newton-John, T., & Slater, A. (2017). The relationship between Facebook and Instagram appearance-focused activities and body image concerns in young women. *Body Image, 23,* 183–187. https://doi.org/10.1016/j.bodyim.2017.10.002
22. Deci, E. L., & Ryan, R. M. (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry, 11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
23. Dictionary.com. (2021). *Definition of appearance*. Www.Dictionary.Com. https://www.dictionary.com/browse/appearance
24. Digital Vidya. (2018, September 12). What are the different types of Social Media? *Digital Vidya*. https://www.digitalvidya.com/blog/types-of-social-media/
25. Dignard, N. A. L., & Jarry, J. L. (2021). The "Little Red Riding Hood effect:" Fitspiration is just as bad as thinspiration for women's body satisfaction. *Body Image, 36,* 201–213. https://doi.org/10.1016/j.bodyim.2020.11.012
26. Dittmar, H., Beattie, J., & Friese, S. (1996). Objects, decision considerations and self-image in men's and women's impulse purchases. *Acta Psychologica, 93*(1), 187–206. https://doi.org/10.1016/0001-6918(96)00019-4
27. Douma, C. (2007, November 20). *The 3 Types of Social Media Communities*. Social Media Today. https://www.socialmediatoday.com/content/3-types-social-media-communities
28. Edwards, C., Tod, D., & Molnar, G. (2014). A systematic review of the drive for muscularity research area. *International Review of Sport and Exercise Psychology, 7*(1), 18–41. https://doi.org/10.1080/1750984X.2013.847113
29. Elsevier. (2018). *What is the difference between ScienceDirect and Scopus data?* https://service.elsevier.com/app/answers/detail/a_id/28240/supporthub/agrm/p/15838/. Accessed 2021, May 22th

30. Emery, S., Kim, Y., Choi, Y. K., Szczypka, G., Wakefield, M., & Chaloupka, F. J. (2012). The Effects of Smoking-Related Television Advertising on Smoking and Intentions to Quit Among Adults in the United States: 1999–2007. *American Journal of Public Health*, *102*(4), 751–757. https://doi.org/10.2105/AJPH.2011.300443
31. Facebook. (2021). Facebook: Company Info. *About Facebook*. https://about.fb.com/company-info/. Accessed 2021, July 20th
32. Fardouly, J., & Rapee, R. M. (2019). The impact of no-makeup selfies on young women's body image. *Body Image*, *28*, 128–134. https://doi.org/10.1016/j.bodyim.2019.01.006
33. Fardouly, J., & Vartanian, L. R. (2016). Social Media and Body Image Concerns: Current Research and Future Directions. *Current Opinion in Psychology*, *9*, 1–5. https://doi.org/10.1016/j.copsyc.2015.09.005
34. Festinger, L. (1954). A Theory of Social Comparison Processes. *Human Relations*, *7*(2), 117–140. https://doi.org/10.1177/001872675400700202
35. Florin, T. A., Shults, J., & Stettler, N. (2011). Perception of Overweight Is Associated With Poor Academic Performance in US Adolescents. *Journal of School Health*, *81*(11), 663–670. https://doi.org/10.1111/j.1746-1561.2011.00642.x
36. Forbes. (2017). *Top Influencers of 2017: Fashion*. Forbes. https://www.forbes.com/top-influencers/fashion/. Accessed 2021, July 10th
37. Garnefski, N., & Kraaij, V. (2006). Cognitive emotion regulation questionnaire – development of a short 18-item version (CERQ-short). *Personality and Individual Differences*, *41*(6), 1045–1053. https://doi.org/10.1016/j.paid.2006.04.010
38. Geyser, W. (2017a, March 14). What is an Influencer? - Social Media Influencers Defined [Updated 2021]. *Influencer Marketing Hub*. Accessed 2021, July 20th https://influencermarketinghub.com/what-is-an-influencer/
39. Geyser, W. (2017b, March 17). Instagram Money Calculator | Estimated Instagram Influencer Earnings per Post. *Influencer Marketing Hub*. Accessed 2021, July 20th https://influencermarketinghub.com/instagram-money-calculator/
40. Geyser, W. (2020, August 28). How Much do TikTokers Make? [Bonus TikTok Influencer Earnings Estimator]. *Influencer Marketing Hub*. https://influencermarketinghub.com/how-much-do-tiktokers-make/.Accessed 2021, July 20th
41. GlobalWebIndex. (2020). *Social flagship report Q3—2020*. GlobalWebIndex.

https://www.globalwebindex.com/hubfs/Downloads/Social%20flagship%20report%20Q3%202020%20-%20GlobalWebIndex.pdf?utm_campaign=Generic%20nurture%202019&utm_medium=email&_hsmi=92167087&_hsenc=p2ANqtz-_BNbM1oVwGdmTuEb2kasNbUyGSD2ENAdUaiBpBogGdvOCdZ0JfEMJvJveq3vO6uMTZk8HlxD0saoNmmN_bOwv1dldYYrgCajKppMxsG7pAz0rgDoI&utm_content=92167087&utm_source=hs_automation

42. Google. (2016, July). *Why YouTube Stars Are More Influential Than Traditional Celebrities*. Think with Google. https://www.thinkwithgoogle.com/marketing-strategies/video/youtube-stars-influence/. Accessed 2021, February 20th
43. Grabe, S., Ward, L. M., & Hyde, J. S. (2008). The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin*, *134*(3), 460–476. https://doi.org/10.1037/0033-2909.134.3.460
44. Groesz, L. M., Levine, M. P., & Murnen, S. K. (2002). The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. *International Journal of Eating Disorders*, *31*(1), 1–16. https://doi.org/10.1002/eat.10005
45. Grogan, S. (2006). Body Image and health—Contemporary Perspectives. *Journal of Health Psychology*, *11*(4), 523–530. https://doi.org/10.1177/1359105306065013
46. Grogan, S. (2017). *Body Image: Understanding Body Dissatisfaction in Men, Women and Children* (3rd ed.). Routledge & CRC Press. https://www.routledge.com/Body-Image-Understanding-Body-Dissatisfaction-in-Men-Women-and-Children/Grogan/p/book/9781138928886
47. Grogan, S., Evans, R., Wright, S., & Hunter, G. (2004). Femininity and Muscularity: Accounts of Seven Women Body Builders. *Journal of Gender Studies*, *13*(1), 49–61. https://doi.org/10.1080/09589236.2004.10599914
48. Hargreaves, D. A., & Tiggemann, M. (2003). Female "Thin Ideal" Media Images and Boys' Attitudes Toward Girls. *Sex Roles*, *49*(9), 539–544. https://doi.org/10.1023/A:1025841008820
49. Hart, L. M., Damiano, S. R., Cornell, C., & Paxton, S. J. (2015). What parents know and want to learn about healthy eating and body image in preschool children: A triangulated qualitative study with parents and Early Childhood Professionals. *BMC Public Health*, *15*(1), 596. https://doi.org/10.1186/s12889-015-1865-4

50. Heatherton, T. F., & Polivy, J. (1991). Development and validation of a scale for measuring state self-esteem. *Journal of Personality and Social Psychology*, *60*(6), 895–910. https://doi.org/10.1037/0022-3514.60.6.895
51. Heinberg, L. J., & Thompson, J. K. (1995). Body Image and Televised Images of Thinness and Attractiveness: A Controlled Laboratory Investigation. *Journal of Social and Clinical Psychology*, *14*(4), 325–338. https://doi.org/10.1521/jscp.1995.14.4.325
52. Henehan, E. R., Joannes, A. E., Greaney, L., Knoll, S., Wong, Q. W., & Ross, C. S. (2020). Youth Cognitive Responses to Alcohol Promotional Messaging: A Systematic Review. *Journal of Studies on Alcohol and Drugs. Supplement*, *Sup 19*, 26–41.
53. Higgins, J. P., Savović, J., Page, M. J., & Sterne, J. A. (2019). *Revised Cochrane risk-of-bias tool for randomized trials (RoB 2)*. Cochrane Collaboration.
54. Hindustan Times. (2017, October 17). 'Bonespiration', 'thinspiration': Scary trends on Instagram that promote eating disorders. *Hindustan Times - Indo Asian News Service*. https://www.hindustantimes.com/more-lifestyle/bonespiration-thinspiration-scary-trends-on-instagram-that-promote-eating-disorders/story-D3V1QJ9a2uHHYv40sQpesK.html. Accessed 2021, July 20th
55. Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image*, *17*, 100–110. https://doi.org/10.1016/j.bodyim.2016.02.008
56. Homan, K., McHugh, E., Wells, D., Watson, C., & King, C. (2012). The effect of viewing ultra-fit images on college women's body dissatisfaction. *Body Image*, *9*(1), 50–56. https://doi.org/10.1016/j.bodyim.2011.07.006
57. Huffpost. (2012, April 23). Instagram Bans "Thinspo." *HuffPost*. https://www.huffpost.com/entry/instagram-bans-thinspo-ph_n_1445863. Accessed 2021, July 10th
58. Inchley, J., Currie, D., Budisavljevic, S., Torsheim, T., Jåstad, A., & Cosma, A. (2020). *Spotlight on adolescent health and well-being. Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada.* (p. 72). World Health Organization Regional Office for Europe. https://apps.who.int/iris/bitstream/handle/10665/332091/9789289055000-eng.pdf
59. Inchley, J., Currie, D., Young, T., Samdal, O., Torsheim, T., Augustson, L., Mathison, F., Aleman-Diaz, A. Y., Molcho, M., Weber, M. W., Barnekow, V., &

World Health Organization. (2016). *Growing up unequal: Gender and socioeconomic differences in young people's health and well-being: Health Behaviour in School-Aged Children (HBSC) Study: international report from the 2013/2014 survey* (p. 276). World Health Organization Regional Office for Europe.

60. Influencer Marketing Hub. (2017, January 20). 80 Influencer Marketing Statistics for 2020. *Influencer Marketing Hub*. Accessed 2021, July 20th https://influencermarketinghub.com/influencer-marketing-statistics/
61. Instagram. (2021, June 8). *Shedding More Light on How Instagram Works*. https://about.instagram.com/blog/announcements/shedding-more-light-on-how-instagram-works. Accessed 2021, June 10th
62. Jankowski, P. (2021, March 5). *Not All Influencers Are Celebrities...Not All Celebrities Are Influencers, Part 2*. Forbes. Accessed 2021, August 10th https://www.forbes.com/sites/pauljankowski/2021/03/05/not-all-influencers-are-celebritiesnot-all-celebrities-are-influencers-part-2/
63. Jenkin, G., Madhvani, N., Signal, L., & Bowers, S. (2014). A systematic review of persuasive marketing techniques to promote food to children on television. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, *15*(4), 281–293. https://doi.org/10.1111/obr.12141
64. Jinxiu, L. (2004). Scientific Publication in China: An Overview and Some Thoughts on Improvement. *Science Editor*, *27*(4), 2.
65. Kalyanaraman, S., & Sundar, S. S. (2006). The Psychological Appeal of Personalized Content in Web Portals: Does Customization Affect Attitudes and Behavior? *Journal of Communication*, *56*(1), 110–132. https://doi.org/10.1111/j.1460-2466.2006.00006.x
66. Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, *53*(1), 59–68. https://doi.org/10.1016/j.bushor.2009.09.003
67. Khamis, S., Ang, L., & Welling, R. (2017). Self-branding, 'micro-celebrity' and the rise of Social Media Influencers. *Celebrity Studies*, *8*(2), 191–208. https://doi.org/10.1080/19392397.2016.1218292
68. Lackes, R., & Siepermann, M. (2020, September 29). *Definition: Web 2.0* [Text]. Enzyklopädie der Wirtschaftsinformatik, Online-Lexikon; Springer Fachmedien Wiesbaden GmbH. https://wirtschaftslexikon.gabler.de/definition/web-20-51842
69. Lee, J. E., & Watkins, B. (2016). YouTube vloggers' influence on consumer luxury

brand perceptions and intentions. *Journal of Business Research*, *69*(12), 5753–5760.

70. Leiner, B. M., Cerf, V. G., Clark, D. D., Kahn, R. E., Kleinrock, L., Lynch, D. C., Postel, J., Roberts, L. G., & Wolff, S. (2009). A brief history of the internet. *ACM SIGCOMM Computer Communication Review*, *39*(5), 22–31. https://doi.org/10.1145/1629607.1629613
71. Lemke, C., & Brenner, W. (2015). *Einführung in die Wirtschaftsinformatik: Band 1: Verstehen des digitalen Zeitalters*. Gabler Verlag. https://doi.org/10.1007/978-3-662-44065-0
72. Lenkert, E. (2020, October 12). *What Is a Content Creator and How To Become One*. Adobe. https://www.adobe.com/express/learn/blog/content-creator. Accessed 2021, July 10th
73. Levine, M. P., & Smolak, L. (2016). The role of protective factors in the prevention of negative body image and disordered eating. *Eating Disorders*, *24*(1), 39–46. https://doi.org/10.1080/10640266.2015.1113826
74. Lopez Khoury, E. N., Litvin, E. B., & Brandon, T. H. (2009). The Effect of Body Image Threat on Smoking Motivation Among College Women: Mediation by Negative Affect. *Psychology of Addictive Behaviors : Journal of the Society of Psychologists in Addictive Behaviors*, *23*(2), 279–286. https://doi.org/10.1037/a0014291
75. Major, B., Testa, M., & Blysma, W. H. (1991). Responses to upward and downward social comparisons: The impact of esteem-relevance and perceived control. In *Social comparison: Contemporary theory and research* (pp. 237–260). Lawrence Erlbaum Associates, Inc.
76. Mask, L., & Blanchard, C. M. (2011). The effects of "thin ideal" media on women's body image concerns and eating-related intentions: The beneficial role of an autonomous regulation of eating behaviors. *Body Image*, *8*(4), 357–365. https://doi.org/10.1016/j.bodyim.2011.06.003
77. McComb, S. E., & Mills, J. S. (2021). Young womens body image following upwards comparison to Instagram models: The role of physical appearance perfectionism and cognitive emotion regulation. *Body Image*, 14.
78. McCutcheon, L. E., Lange, R., & Houran, J. (2002). Conceptualization and measurement of celebrity worship. *British Journal of Psychology*, *93*(1), 67–87. https://doi.org/10.1348/000712602162454

79. McLachlan, S. (2020, August 13). How to Increase Social Media Engagement: A Guide for Marketers. *Social Media Marketing & Management Dashboard*. https://blog.hootsuite.com/social-media-engagement/
80. McLean, S. A., Paxton, S. J., Wertheim, E. H., & Masters, J. (2015). Photoshopping the selfie: Self photo editing and photo investment are associated with body dissatisfaction in adolescent girls. *International Journal of Eating Disorders*, *48*(8), 1132–1140. https://doi.org/10.1002/eat.22449
81. Meinel, C., & Sack, H. (2013). *Internetworking: Technological Foundations and Applications*. Springer-Verlag. https://doi.org/10.1007/978-3-642-35392-5
82. Merriam-Webster. (2021a). *Definition of appearance*. https://www.merriam-webster.com/dictionary/appearance
83. Merriam-Webster. (2021b). *Definition of social media*. https://www.merriam-webster.com/dictionary/social+media
84. Mosseri, A. (2021, June 30). *Adam Mosseri statement on Instagram*. Instagram. https://www.instagram.com/tv/CQwNfFBJr5A/
85. Mountford, V. A., & Koskina, A. (2015). Body Image. In T. Wade (Ed.), *Encyclopedia of Feeding and Eating Disorders* (pp. 1–5). Springer. https://doi.org/10.1007/978-981-287-087-2_74-1
86. Murray, S. B., Griffiths, S., Mond, J. M., Kean, J., & Blashill, A. J. (2016). Anabolic steroid use and body image psychopathology in men: Delineating between appearance- versus performance-driven motivations. *Drug and Alcohol Dependence*, *165*, 198–202. https://doi.org/10.1016/j.drugalcdep.2016.06.008
87. Neumark-Sztainer, D., Paxton, S. J., Hannan, P. J., Haines, J., & Story, M. (2006). Does body satisfaction matter? Five-year longitudinal associations between body satisfaction and health behaviors in adolescent females and males. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, *39*(2), 244–251. https://doi.org/10.1016/j.jadohealth.2005.12.001
88. Ngo, N. T. (2019). What Historical Ideals of Women's Shapes Teach Us About Women's Self-Perception and Body Decisions Today. *AMA Journal of Ethics*, *21*(10), 879–901. https://doi.org/10.1001/amajethics.2019.879
89. Nykjaer, M. (2014, April 28). On fitspiration and thinspiration. *Marianne Nykjaer*. http://mariannenykjaer.com/2014/04/on-fitspiration-and-thinspiration/. Accessed 2021, July 20th
90. Ofcom. (2018). *Children and Parents: Media Use and Attitudes Report 2018*. 18.

91. O'Reilly, T. (2007). *What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software*. *65*, 22.
92. Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan—A web and mobile app for systematic reviews. *Systematic Reviews*, *5*(1). https://doi.org/10.1186/s13643-016-0384-4
93. Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, n71. https://doi.org/10.1136/bmj.n71
94. Parker, R. (2009). The Female Body and Body Image: A Historical Perspective. In R. Parker (Ed.), *Women, Doctors and Cosmetic Surgery: Negotiating the 'Normal' Body* (pp. 25–37). Palgrave Macmillan UK. https://doi.org/10.1057/9780230246645_3
95. Paxton, S. J., Neumark-Sztainer, D., Hannan, P. J., & Eisenberg, M. E. (2006). Body Dissatisfaction Prospectively Predicts Depressive Mood and Low Self-Esteem in Adolescent Girls and Boys. *Journal of Clinical Child & Adolescent Psychology*, *35*(4), 539–549. https://doi.org/10.1207/s15374424jccp3504_5
96. Pelletier, L., Dion, S., & Lévesque, C. (2004). Can Self-Determination Help Protect Women Against Sociocultural Influences About Body Image and Reduce Their Risk of Experiencing Bulimic Symptoms. *Journal of Social and Clinical Psychology*, *23*, 61–88. https://doi.org/10.1521/jscp.23.1.61.26990
97. Perez, S. (2018, November 2). TikTok surpassed Facebook, Instagram, Snapchat & YouTube in downloads last month. *TechCrunch*. https://social.techcrunch.com/2018/11/02/tiktok-surpassed-facebook-instagram-snapchat-youtube-in-downloads-last-month/. Accessed 2021, July 10th
98. Perloff, R. M. (2014). Social Media Effects on Young Women's Body Image Concerns: Theoretical Perspectives and an Agenda for Research. *Sex Roles*, *71*(11), 363–377. https://doi.org/10.1007/s11199-014-0384-6
99. Perrin, A. (2015, October 8). Social Media Usage: 2005-2015. *Pew Research Center: Internet, Science & Tech*. https://www.pewresearch.org/internet/2015/10/08/social-networking-usage-2005-2015/

100. Postel, J., & Reynolds, J. (1985). *RFC 0959: File Transfer Protocol*. https://www.hjp.at/doc/rfc/rfc959.html

101. Pourmoradian, S., Ostadrahimi, A., Bonab, A. M., Roudsari, A. H., Jabbari, M., & Irandoost, P. (2021). Television food advertisements and childhood obesity: A systematic review. *International Journal for Vitamin and Nutrition Research. Internationale Zeitschrift Fur Vitamin- Und Ernahrungsforschung. Journal International De Vitaminologie Et De Nutrition*, *91*(1–2), 3–9. https://doi.org/10.1024/0300-9831/a000681

102. Pournaghi Azar, F., Mamizadeh, M., Nikniaz, Z., Ghojazadeh, M., Hajebrahimi, S., Salehnia, F., & Mashhadi Abdolahi, H. (2018). Content analysis of advertisements related to oral health in children: A systematic review and meta-analysis. *Public Health*, *156*, 109–116. https://doi.org/10.1016/j.puhe.2017.12.012

103. Prichard, I., Kavanagh, E., Mulgrew, K. E., Lim, M. S. C., & Tiggemann, M. (2020). The effect of Instagram #fitspiration images on young womens mood, body image, and exercise behaviour. *Body Image*, 6.

104. PRISMA. (2020). *PRISMA 2020 Checklist*. http://prisma-statement.org/PRISMAStatement/Checklist.aspx

105. quotidiano.net. (2017, September 29). *Forbes, Chiara Ferragni è la influencer (di moda) più importante al mondo*. Quotidiano.Net. https://www.quotidiano.net/magazine/forbes-chiara-ferragni-1.3430629

106. Reaves, S., Hitchon, J. B., Park, S.-Y., & Yun, G. W. (2004). If Looks Could Kill: Digital Manipulation of Fashion Models. *Journal of Mass Media Ethics*, *19*(1), 56–71. https://doi.org/10.1207/s15327728jmme1901_5

107. Rosenberg, M. (1965). Rosenberg Self-Esteem Scale. In *Society and the adolescent self-image*. Princeton University Press. https://fetzer.org/sites/default/files/images/stories/pdf/selfmeasures/Self_Measures_for_Self-Esteem_ROSENBERG_SELF-ESTEEM.pdf

108. Rossi, C. D., & Adam, S. (2021). *#food in social media: Trends und ihre möglichen Wirkungen auf das Essverhalten*. Ernährung im Fokus 01/2021, 16-21.

109. Rounsefell, K., Gibson, S., McLean, S., Blair, M., Molenaar, A., Brennan, L., Truby, H., & McCaffrey, T. A. (2020). Social media, body image and food choices in healthy young adults: A mixed methods systematic review. *Nutrition & Dietetics*, *77*(1), 19–40. https://doi.org/10.1111/1747-0080.12581

110. Sampson, A., Jeremiah, H. G., Andiappan, M., & Newton, J. T. (2020). The

effect of viewing idealised smile images versus nature images via social media on immediate facial satisfaction in young adults: A randomised controlled trial. *Journal of Orthodontics*, *47*(1), 55–64. https://doi.org/10.1177/1465312519899664

111. Schaefer, L. M., Harriger, J. A., Heinberg, L. J., Soderberg, T., & Kevin Thompson, J. (2017). Development and validation of the sociocultural attitudes towards appearance questionnaire-4-revised (SATAQ-4R). *The International Journal of Eating Disorders*, *50*(2), 104–117. https://doi.org/10.1002/eat.22590

112. Schünemann, H., Brozek, J., Guyatt, G., & Oxman, A. (2013, October). *GRADE handbook*. https://gdt.gradepro.org/app/handbook/handbook.html

113. Sicurella, S. (2021, July 1). Pinterest Bans All Weight Loss Ads. *NPR*. https://www.npr.org/2021/07/01/1012260233/pinterest-bans-all-weight-loss-ads

114. Slade, P. D., Dewey, M. E., Newton, T., Brodie, D., & Kiemle, G. (1990). Development and preliminary validation of the body satisfaction scale (BSS). *Psychology & Health*, *4*(3), 213–220. https://doi.org/10.1080/08870449008400391

115. Smolak, L., & Thompson, J. K. (Eds.). (2009). *Body image, eating disorders, and obesity in youth: Assessment, prevention, and treatment* (2nd ed). American Psychological Association.

116. Social Media Today. (2015, June 28). *5 Biggest Differences between Social Media and Social Networking*. Social Media Today. https://www.socialmediatoday.com/social-business/peteschauer/2015-06-28/5-biggest-differences-between-social-media-and-social

117. Statista. (2018, February). *Social media: Usage share by age Germany 2017*. Statista. https://www.statista.com/statistics/790969/social-media-usage-share-by-age-germany/

118. Statista. (2021). *Instagram—Influencer-Einkommen pro Post in Deutschland 2020*. Statista. https://de.statista.com/statistik/daten/studie/1119636/umfrage/influencer-einkommen-pro-post/

119. Stautz, K., Brown, K., King, S., Shemilt, I., & Marteau, T. (2016). Immediate effects of alcohol marketing communications and media portrayals on consumption and cognition: A systematic review and meta-analysis of experimental studies—PubMed. *BMC Public Health*, *9*(16), 465.

120. Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin*, *128*(5), 825–848.

121. Storm, M. (2020, April 1). 5 Types of Social Media and Examples of Each. *WebFX Blog*. https://www.webfx.com/blog/social-media/types-of-social-media/

122. Talwar, S., Dhir, A., Singh, D., Virk, G. S., & Salo, J. (2020). Sharing of fake news on social media: Application of the honeycomb framework and the third-person effect hypothesis. *Journal of Retailing and Consumer Services*, *57*, 102197. https://doi.org/10.1016/j.jretconser.2020.102197

123. The Cochrane Collaboration. (2021a). *Chapter 14: Completing 'Summary of findings' tables and grading the certainty of the evidence*. https://training.cochrane.org/handbook/current/chapter-14

124. The Cochrane Collaboration. (2021b). *Reporting Biases*. Cochrane Methods. https://methods.cochrane.org/bias/reporting-biases

125. The National Eating Disorders Collaboration (NEDC). (2021). *Fact Sheet Body Image*. The National Eating Disorders Collaboration (NEDC). https://nedc.com.au/assets/Fact-Sheets/NEDC-Fact-Sheet-Body-Image.pdf

126. Thompson, J. K. (2004). The (mis)measurement of body image: Ten strategies to improve assessment for applied and research purposes. *Body Image*, *1*(1), 7–14. https://doi.org/10.1016/S1740-1445(03)00004-4

127. Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance* (pp. xii, 396). American Psychological Association. https://doi.org/10.1037/10312-000

128. Tiggemann, M. (2012). Sociocultural perspectives on human appearance and body image. In T. Cash & L. Smolak (Eds.), *Body Image: Second Edition: A Handbook of Science, Practice, and Prevention* (p. 490). Guilford Press. https://www.guilford.com/books/Body-Image/Cash-Smolak/9781462509584/contents

129. Tiggemann, M., & Anderberg, I. (2020). Muscles and bare chests on Instagram: The effect of Influencers' fashion and fitspiration images on men's body image. *Body Image*, *35*, 237–244. https://doi.org/10.1016/j.bodyim.2020.10.001

130. Tiggemann, M., & McGill, B. (2004). The Role of Social Comparison in the Effect of Magazine Advertisements on Women's Mood and Body Dissatisfaction. *Journal of Social and Clinical Psychology*, *23*(1), 23–44. https://doi.org/10.1521/jscp.23.1.23.26991

131. Tiggemann, M., & Slater, A. (2004). Thin ideals in music television: A

source of social comparison and body dissatisfaction. *International Journal of Eating Disorders*, *35*(1), 48–58. https://doi.org/10.1002/eat.10214

132. Tiggemann, M., & Zaccardo, M. (2015). "Exercise to be fit, not skinny": The effect of fitspiration imagery on women's body image. *Body Image*, *15*, 61–67. https://doi.org/10.1016/j.bodyim.2015.06.003

133. Tylka, T. L., & Diest, A. M. K. V. (2015). Protective Factors. In *The Wiley Handbook of Eating Disorders* (pp. 430–444). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118574089.ch33

134. Tylka, T. L., & Wood-Barcalow, N. L. (2015). The Body Appreciation Scale-2: Item refinement and psychometric evaluation. *Body Image*, *12*, 53–67. https://doi.org/10.1016/j.bodyim.2014.09.006

135. Usher, B. (2020). Rethinking microcelebrity: Key points in practice, performance and purpose. *Celebrity Studies*, *11*(2), 171–188. https://doi.org/10.1080/19392397.2018.1536558

136. van den Berg, P., Thompson, J. K., Obremski-Brandon, K., & Coovert, M. (2002). The Tripartite Influence model of body image and eating disturbance. *Journal of Psychosomatic Research*, *53*(5), 1007–1020. https://doi.org/10.1016/S0022-3999(02)00499-3

137. Van Vleck, T. (2012). Electronic Mail and Text Messaging in CTSS, 1965-1973. *IEEE Annals of the History of Computing*, *34*(1), 4–6. https://doi.org/10.1109/MAHC.2012.6

138. Vansteenkiste, M., & Ryan, R. M. (2013). On psychological growth and vulnerability: Basic psychological need satisfaction and need frustration as a unifying principle. *Journal of Psychotherapy Integration*, *23*(3), 263–280. https://doi.org/10.1037/a0032359

139. Veirman, M. D., Cauberghe, V., & Hudders, L. (2017). Marketing through Instagram influencers: The impact of number of followers and product divergence on brand attitude. *International Journal of Advertising*, *36*(5), 798–828. https://doi.org/10.1080/02650487.2017.1348035

140. Wasylkiw, L., Emms, A. A., Meuse, R., & Poirier, K. F. (2009). Are all models created equal? A content analysis of women in advertisements of fitness versus fashion magazines. *Body Image*, *6*(2), 137–140. https://doi.org/10.1016/j.bodyim.2009.01.005

141. Watson, R., & Vaughn, L. M. (2006). Limiting the Effects of the Media on

Body Image: Does the Length of a Media Literacy Intervention Make a Difference? *Eating Disorders*, *14*(5), 385–400. https://doi.org/10.1080/10640260600952530

142. We Are Social. (2020). *Digital 2020 Deutschland*. We Are Social. https://wearesocial.com/de/digital-2020-deutschland

143. World Health Organization (WHO). (2020). *Body mass index—BMI*. World Health Organization (WHO). https://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi

144. Yamamiya, Y., Cash, T. F., Melnyk, S. E., Posavac, H. D., & Posavac, S. S. (2005). Women's exposure to thinand-beautiful media images: Body image effects of media-ideal internalization and impact-reduction interventions. *Body Image*, 74–80.

145. Yang, H., & Stoeber, J. (2012). The Physical Appearance Perfectionism Scale: Development and Preliminary Validation. *Journal of Psychopathology and Behavioral Assessment*, *34*(1), 69–83. https://doi.org/10.1007/s10862-011-9260-7

146. Zotero.org. (2021). *Zotero: Homepage*. https://www.zotero.org/

147.

Appendix

Index of the appendix

a) Search Strategy on PubMed

(Date of Search: 10.06.2021)

Query#	**Keywords**	**Filters**	**Results**
#1	eating disorder*	From 1.1.2004	29595
#2	disordered eating	From 1.1.2004	3679
#3	Body image	From 1.1.2004	37190
#4	body dissatisfaction	From 1.1.2004	3783
#5	body satisfaction	From 1.1.2004	9932
#6	drive for thinness	From 1.1.2004	666
#7	drive for muscularity	From 1.1.2004	175
#8	thin ideal	From 1.1.2004	2502
#9	weight perception	From 1.1.2004	6373
#10	weight cycling	From 1.1.2004	24020
#11	weight concern	From 1.1.2004	30076
#12	appearance	From 1.1.2004	793611
#13	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12	From 1.1.2004	909618
#14	social media	From 1.1.2004	31489

#15	social networking sites	From 1.1.2004	1310
#16	facebook	From 1.1.2004	4819
#17	twitter	From 1.1.2004	5410
#18	instagram	From 1.1.2004	873
#19	tumblr	From 1.1.2004	57
#20	pinterest	From 1.1.2004	83
#21	flickr	From 1.1.2004	130
#22	tiktok	From 1.1.2004	50
#23	youtube	From 1.1.2004	1933
#24	#14 OR #15 OR #16 OR #17 OR #18 OR #19 OR#20 OR #21 OR #22 OR #23	From 1.1.2004	36725
#25	#13 AND #24	From 1.1.2004	3095
	((((((((((eating disorder*) OR (disordered eating)) OR (BI)) OR (body dissatisfaction)) OR (body satisfaction)) OR (drive for thinness)) OR (drive for muscularity)) OR (thin ideal)) OR (weight perception)) OR (weight cycling)) OR (weight concern)) OR (appearance)	From 1.1.2004	1,666,601
	((((((((((social media) OR (social networking sites)) OR (facebook)) OR (twitter)) OR (instagram)) OR (tumblr)) OR (pinterest)) OR (flickr)) OR (tiktok)) OR (youtube))	From 1.1.2004	39,432

	((((((((((eating disorder*) OR (disordered eating)) OR (BI)) OR (body dissatisfaction)) OR (body satisfaction)) OR (drive for thinness)) OR (drive for muscularity)) OR (thin ideal)) OR (weight perception)) OR (weight cycling)) OR (weight concern)) OR (appearance) AND ((((((((((social media) OR (social networking sites)) OR (facebook)) OR (twitter)) OR (instagram)) OR (tumblr)) OR (pinterest)) OR (flickr)) OR (tiktok)) OR (youtube))	From 1.1.2004	3,377
	((((((((((eating disorder*) OR (disordered eating)) OR (BI)) OR (body dissatisfaction)) OR (body satisfaction)) OR (drive for thinness)) OR (drive for muscularity)) OR (thin ideal)) OR (weight perception)) OR (weight cycling)) OR (weight concern)) OR (appearance) AND ((((((((((social media) OR (social networking sites)) OR (facebook)) OR (twitter)) OR (instagram)) OR (tumblr)) OR (pinterest)) OR (flickr)) OR (tiktok)) OR (youtube))	From 01.01.2004	3,095

b) Search Strategy on Scopus

(Date of Search: 10.06.2021)

Query#	Keywords	Filters	Results
	TITLE-ABS-KEY ((((((((((eating AND disorder*) OR (disordered AND eating)) OR (body AND image)) OR (body AND dissatisfaction)) OR (body AND satisfaction)) OR (drive AND for AND thinness)) OR (drive AND for AND muscularity)) OR (thin AND ideal)) OR (weight AND perception)) OR (weight AND cycling)) OR (weight AND concern)) OR (appearance) AND (((((((((social AND media) OR (social AND networking AND sites)) OR (facebook)) OR (twitter)) OR (instagram)) OR (tumblr)) OR (pinterest)) OR (flickr)) OR (tiktok)) OR (youtube))) AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2010) OR LIMIT-TO (PUBYEAR , 2009) OR LIMIT-TO (PUBYEAR , 2008) OR LIMIT-TO (PUBYEAR , 2007) OR LIMIT-TO (		3164

	PUBYEAR , 2006) OR LIMIT-TO (PUBYEAR , 2005) OR LIMIT-TO (PUBYEAR , 2004)) AND (LIMIT-TO (SUBJAREA , "MEDI") OR LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "PSYC") OR LIMIT-TO (SUBJAREA , "COMP") OR LIMIT-TO (SUBJAREA , "ARTS") OR LIMIT-TO (SUBJAREA , "NURS") OR LIMIT-TO (SUBJAREA , "AGRI") OR LIMIT-TO (SUBJAREA , "HEAL") OR LIMIT-TO (SUBJAREA , "DECI") OR LIMIT-TO (SUBJAREA , "MULT")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SRCTYPE , "j"))		

c) Search Strategy on The Cochrane Collaboration

(Date of Search: 10.06.2021)

Query#	**Keywords**	**Filters**	**Results Embase**	**Results CINAHL**
#1	eating disorder*	From 1.1.2004	1607	105
#2	disordered eating	From 1.1.2004	1609	105
#3	body image	From 1.1.2004	4940	104
#4	body dissatisfaction	From 1.1.2004	214	8
#5	body satisfaction	From 1.1.2004	1997	39
#6	drive for thinness	From 1.1.2004	29	0
#7	drive for muscularity	From 1.1.2004	31	0
#8	thin ideal	From 1.1.2004	78	2
#9	weight perception	From 1.1.2004	649	13
#10	weight cycling	From 1.1.2004	1842	24
#11	weight concern	From 1.1.2004	1675	2
#12	appearance	From 1.1.2004	28617	41
#13	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12	From 1.1.2004	39557	284

#14	social media	From 1.1.2004	1581	48
#15	social networking sites	From 1.1.2004	139	1
#16	facebook	From 1.1.2004	320	14
#17	twitter	From 1.1.2004	97	1
#18	instagram	From 1.1.2004	54	4
#19	tumblr	From 1.1.2004	1	0
#20	pinterest	From 1.1.2004	3	0
#21	flickr	From 1.1.2004	0	0
#22	tiktok	From 1.1.2004	0	0
#23	youtube	From 1.1.2004	72	0
#24	#14 OR #15 OR #16 OR #17 OR #18 OR #19 OR#20 OR #21 OR #22 OR #23	From 1.1.2004	1895	54
#25	#13 AND #24	From 1.1.2004	1906	125

d) List of excluded studies during assessment for eligibility

(abstract screening, N=171)

Labelled "wrong intervention" (N = 67)

Title	Year	Authors
Investment in body image for self-definition results in greater vulnerability to the thin media than does investment in appearance management.	2008	Ip K and Jarry JL
[The impact of exposure to images of ideally thin models on body dissatisfaction in young French and Italian women].	2009	Rodgers R and Chabrol H
Female body dissatisfaction after exposure to overweight and thin media images: The role of body mass index and neuroticism	2009	Dalley, S.E., Buunk, A.P., Umit, T.
Muscular Ideal Media Images and Men's Body Image: Social Comparison Processing and Individual Vulnerability	2009	Hargreaves, D.A., Tiggemann, M.
The effects of "thin ideal" media on women's body image concerns and eating-related intentions: the beneficial role of an autonomous regulation of eating behaviors.	2011	Mask L and Blanchard CM
Does the Internet function like magazines? An exploration of image-focused media, eating pathology, and body dissatisfaction	2012	Bair, C.E., Kelly, N.R., Serdar, K.L., Mazzeo, S.E.
The impact of thin idealized media images on body satisfaction: does body appreciation protect women from negative effects?	2013	Halliwell, E
Comparative effects of Facebook and conventional media on body image dissatisfaction.	2015	Cohen R and Blaszczynski A
Social comparisons on social media: the impact of Facebook on young women's body image concerns and mood.	2015	Fardouly J and Diedrichs PC and Vartanian LR and Halliwell E
Media exposure, mediated social comparison to idealized images of muscularity, and anabolic steroid use.	2015	Melki JP and Hitti EA and Oghia MJ and Mufarrij AA
The effect of thin and muscular images on women's body satisfaction	2015	Benton, C and Karazsia, BT
#fitspo or #loveyourself? The impact of fitspiration and self-compassion Instagram images on women's body image, self-compassion, and mood.	2017	Slater A and Varsani N and Diedrichs PC
Idealised media images: The effect of fitspiration imagery on body satisfaction and exercise behaviour.	2017	Robinson L and Prichard I and Nikolaidis A and Drummond C and Drummond M and Tiggemann M
Media influence on drive for thinness, body satisfaction, and eating attitudes among young women in Hong Kong and China.	2017	Rochelle TL and Hu WY
"Strong beats skinny every time": Disordered eating and compulsive exercise in women who post fitspiration on Instagram.	2017	Holland G and Tiggemann M

Title	Year	Authors
Children's body image and social comparisons with peers and the media.	2017	Tatangelo GL and Ricciardelli LA
Social media consume, media influence and body dissatisfaction among brazilian female adolescents	2017	Lira, A.G., Ganen, A.P., Lodi, A.S., Alvarenga, M.S.
Young men's minimisation of their body dissatisfaction.	2018	Jankowski GS and Gough B and Fawkner H and Halliwell E and Diedrichs PC
The effects of viewing thin, sexualized selfies on Instagram: Investigating the role of image source and awareness of photo editing practices.	2018	Vendemia MA and DeAndrea DC
"Selfie" harm: Effects on mood and body image in young women.	2018	Mills JS and Musto S and Williams L and Tiggemann M
The effect of functionality-focused and appearance-focused images of models of mixed body sizes on women's state-oriented body appreciation.	2018	Williamson G and Karazsia BT
Thin Is In? Think Again: The Rising Importance of Muscularity in the Thin Ideal Female Body	2018	Bozsik, F., Whisenhunt, B.L., Hudson, D.L., Bennett, B., Lundgren, J.D.
Instagram use and young women's body image concerns and self-objectification: Testing mediational pathways	2018	Fardouly, J., Willburger, B.K., Vartanian, L.R.
Picture Perfect: The Direct Effect of Manipulated Instagram Photos on Body Image in Adolescent Girls	2018	Kleemans, M., Daalmans, S., Carbaat, I., Anschütz, D.
Being successful and being thin: The effects of thin-ideal social media images with high socioeconomic status on women's body image and eating behaviour	2018	Qi, W., Cui, L.
Effects of thin-ideal instagram images: The roles of appearance comparisons, internalization of the thin ideal and critical media processing.	2019	Anixiadis F and Wertheim EH and Rodgers R and Caruana B
The effect of #enhancement-free Instagram images and hashtags on women's body image.	2019	Tiggemann M and Zinoviev K
Thin Media Images Decrease Women's Body Satisfaction: Comparisons Between Veiled Muslim Women, Christian Women and Atheist Women Regarding Trait and State Body Image.	2019	Wilhelm L and Hartmann AS and Becker JC and Kisi M and Waldorf M and Vocks S
Muscle Talk Online and Impression Formation Based on Body Type: Comparisons Between Asian American and Caucasian American Males.	2019	Taniguchi E and Lee HE
The effect of exposure to parodies of thin-ideal images on young women's body image and mood.	2019	Slater A and Cole N and Fardouly J
Me, my selfie, and I: The relationship between editing and posting selfies and body dissatisfaction in men and women.	2019	Lonergan AR and Bussey K and Mond J and Brown O and Griffiths S and Murray SB and Mitchison D
Images of Thin and Plus-Size Models Produce Opposite Effects on Women's Body Image, Body Dissatisfaction, and Anxiety	2019	Moreno-Domínguez, S., Servián-Franco, F., Reyes del Paso, G.A., Cepeda-Benito, A.
Can image labels be used to reduce the impact of the muscular ideal in men?	2019	Mulgrew, K.E., Jeffrey, A.
Effects of social media contents on the perception of body image	2019	Alanazi, A.S., Alotaibi, Y.M., Alojan, J.S., Zaidi, U., Rao, H.M.

Title	Year	Authors
Sexually objectifying selfies: Gender impression management, body image concern, and appearance-related social comparisons	2019	Felstead, M.
The effects of fitspiration images on body attributes, mood and eating behaviors: An experimental Ecological Momentary Assessment study in females.	2020	Krug I and Selvaraja P and Fuller-Tyszkiewicz M and Hughes EK and Slater A and Griffiths S and Yee ZW and Richardson B and Blake K
Body Positivity (#BoPo) in everyday life: An ecological momentary assessment study showing potential benefits to individuals' body image and emotional wellbeing.	2020	Stevens A and Griffiths S
Strong is the New Skinny, but is it Ideal?: A Test of the Tripartite Influence Model using a new Measure of Fit-Ideal Internalisation.	2020	Donovan CL and Uhlmann LR and Loxton NJ
The differential impact of viewing fitspiration and thinspiration images on men's body image concerns: An experimental ecological momentary assessment study.	2020	Yee ZW and Griffiths S and Fuller-Tyszkiewicz M and Blake K and Richardson B and Krug I
Effects of Social Media and Smartphone Use on Body Esteem in Female Adolescents: Testing a Cognitive and Affective Model.	2020	Yang H and Wang JJ and Tng GYQ and Yang S
Building resilience to body image triggers using brief cognitive training on a mobile application: A randomized controlled trial.	2020	Aboody D and Siev J and Doron G
#nomakeupselfie: The impact of natural no-makeup images and positive appearance comments on young women's body image.	2020	Politte-Corn M and Fardouly J
Compared to Facebook, Instagram use causes more appearance comparison and lower body satisfaction in college women.	2020	Engeln R and Loach R and Imundo MN and Zola A
The effect of viewing challenging "reality check" Instagram comments on women's body image.	2020	Tiggemann M and Velissaris VG
Experimental Effects of Viewing Thin and Plus-size Models in Objectifying and Empowering Contexts on Instagram.	2020	Hendrickse J and Clayton RB and Ray EC and Ridgway JL and Secharan R
Posting edited photos of the self: Increasing eating disorder risk or harmless behavior?	2020	Wick MR and Keel PK
Muscles and the Media: A Natural Experiment Across Cultures in Men's Body Image.	2020	Thornborrow T and Onwuegbusi T and Mohamed S and Boothroyd LG and Tovée MJ
A picture is worth a thousand words: The effect of viewing celebrity Instagram images with disclaimer and body positive captions on women's body image.	2020	Brown Z and Tiggemann M
Visual and cognitive processing of thin-ideal Instagram images containing idealized or disclaimer comments.	2020	Couture Bue AC and Harrison K
Blurred boundaries between Pro-Anorexia and Fitspiration media? Diverging cognitive and emotional effects.	2020	Jennings AF and LeBlanc H and Kisch K and Lancaster S and Allen J
Internalized Media-Promoted Body Ideals Only Marginally Moderate the Effects of Exercise on Self-Esteem, Body Image Satisfaction, and Physical Self-Perceptions.	2020	Legrand F and Silete G and Schiffler F

Title	Year	Authors
The effect of thin and average-sized models on women's appearance and functionality satisfaction: Does pose matter?	2020	Mulgrew KE and Schulz K and Norton O and Tiggemann M
Does taking selfies lead to increased desire to undergo cosmetic surgery.	2020	Shome D and Vadera S and Male SR and Kapoor R
Social media is not real: The effect of ‘Instagram vs reality’ images on women’s social comparison and body image	2020	Tiggemann, M., Anderberg, I.
Instagram and body image: Motivation to conform to the “Instabod” and consequences on young male wellbeing	2020	Chatzopoulou, E., Filieri, R., Dogruyol, S.A.
The looking glass selfie: Instagram use frequency predicts visual attention to high-anxiety body regions in young women	2020	Couture Bue, A.C.
Differential media effects on male body satisfaction and mood	2020	Allen, A., Mulgrew, K.E.
What do others’ reactions to body posting on Instagram tell us? The effects of social media comments on viewers’ body image perception	2020	Kim, H.M.
Is Fitspiration the Healthy Internet Trend It Claims to Be? A British Students' Case Study.	2021	Limniou M and Mahoney C and Knox M
The effects of fitspiration and self-compassion Instagram posts on body image and self-compassion in men and women.	2021	Barron AM and Krumrei-Mancuso EJ and Harriger JA
The ever-changing ideal: The body you want depends on who else you're looking at.	2021	Aniulis E and Sharp G and Thomas NA
Effects of taking selfies on women's self-objectification, mood, self-esteem, and social aggression toward female peers.	2021	Fox J and Vendemia MA and Smith MA and Brehm NR
Does body appreciation or satisfaction buffer against idealised functionality-focused images of models?	2021	Mulgrew KE and Findlay C and Lane BR and Halliwell E
Do the metrics matter? An experimental investigation of Instagram influencer effects on mood and body dissatisfaction.	2021	Lowe-Calverley E and Grieve R
Snapchat lenses and body image concerns	2021	Burnell, K., Kurup, A.R., Underwood, M.K.
'She Should Not Be a Model': The Effect of Exposure to Plus-Size Models on Body Dissatisfaction, Mood, and Facebook Commenting Behaviour	2021	Talbot, D., Mansfield, H., Hayes, S., Smith, E.
BoPopriation: How self-promotion and corporate commodification can undermine the body positivity (BoPo) movement on Instagram	2021	Brathwaite, K.N., DeAndrea, D.C.

Labelled “no intervention” (N = 82)

Title	Year	Authors
Media influence on the body image of children and adolescents.	2006	Lawrie Z and Sullivan EA and Davies PS and Hill RJ
Relationships amongst body dissatisfaction, internalisation of the media body ideal and perceived pressure from media in adolescent girls and boys.	2007	Knauss C and Paxton SJ and Alsaker FD
Body dissatisfaction and body comparison with media images in males and females.	2007	van den Berg P and Paxton SJ and Keery H and Wall M and Guo J and Neumark-Sztainer D
Body dissatisction and body comparison with media images in males and females	2008	Van Den Berg, P., Paxton, S.J., Keery, H., Wall, M., Guo, J., Neumark-Sztainer, D.
The drive for muscularity in men: media influences and objectification theory.	2010	Daniel S and Bridges SK
Media exposure, internalization of the thin ideal, and body dissatisfaction: comparing Asian American and European American college females.	2011	Nouri M and Hill LG and Orrell-Valente JK
The association between exposure to mass media and body dissatisfaction among spanish adolescents	2011	Calado, M., Lameiras, M., Sepulveda, A.R., Rodriguez, Y., Carrera, M.V.
Relationships between self-esteem, media influence and drive for thinness.	2012	Fernandez S and Pritchard M
Media effects on body image: Examining media exposure in the broader context of internal and other social factors	2012	Van Vonderen, K.E., Kinnally, W.
NetGirls: the Internet, Facebook, and body image concern in adolescent girls.	2013	Tiggemann M and Slater A
Media's influence on the drive for muscularity in undergraduates	2013	Cramblitt, B., Pritchard, M.
Men and women facing objectification: The effects of media models on wellbeing, self-esteem and ambivalent sexism	2013	Rollero, C.
Association of thin-ideal media exposure, body dissatisfaction and disordered eating behaviors among adolescents in Taiwan	2013	Chang, F.-C., Lee, C.-M., Chen, P.-H., Chiu, C.-H., Pan, Y.-C., Huang, T.-F.
Social media use, body image, and psychological well-being: a cross-cultural comparison of Korea and the United States.	2014	Lee HR and Lee HE and Choi J and Kim JH and Han HL
Facebook photo activity associated with body image disturbance in adolescent girls.	2014	Meier EP and Gray J
NetTweens: The Internet and Body Image Concerns in Preteenage Girls	2014	Tiggemann, M., Slater, A.
Photoshopping the selfie: Self photo editing and photo investment are associated with body dissatisfaction in adolescent girls.	2015	McLean SA and Paxton SJ and Wertheim EH and Masters J
Body image 2.0: Associations between social grooming on Facebook and body image concerns	2015	Kim, J.W., Chock, T.M.

Title	Year	Authors
Media and life dissatisfaction as predictors of body dissatisfaction	2015	Jaeger, M.B., Câmara, S.G.
Media Exposure, Extracurricular Activities, and Appearance-Related Comments as Predictors of Female Adolescents' Self-Objectification	2015	Slater, A., Tiggemann, M.
Use of social networking sites and perception and intentions regarding body weight among adolescents.	2016	Sampasa-Kanyinga H and Chaput JP and Hamilton HA
Higher Facebook use predicts greater body image dissatisfaction during pregnancy: The role of self-comparison.	2016	Hicks S and Brown A
Instagram Unfiltered: Exploring Associations of Body Image Satisfaction, Instagram #Selfie Posting, and Negative Romantic Relationship Outcomes.	2016	Ridgway JL and Clayton RB
Social Network Sites, Friends, and Celebrities: The Roles of Social Comparison and Celebrity Involvement in Adolescents' Body Image Dissatisfaction	2016	Ho, S.S., Lee, E.W.J., Liao, Y.
Negative body talk as an outcome of friends' fitness posts on social networking sites: body surveillance and social comparison as potential moderators	2016	Arroyo, A., Brunner, S.R.
The relationship between Instagram selfies and body image in young adult women	2016	Wagner, C., Aguirre, E., Sumner, E.M.
The impact of appearance comparisons made through social media, traditional media, and in person in women's everyday lives.	2017	Fardouly J and Pinkus RT and Vartanian LR
Facebook use and negative body image among U.S. college women.	2017	Eckler P and Kalyango Y and Paasch E
Social networking site uses, internalization, body surveillance, social comparison and body dissatisfaction of males and females in mainland China	2017	Xiaojing, A.
#Socialmedia: Exploring the relationship of social networking sites on body image, self-esteem, and eating disorders	2017	Santarossa, S., Woodruff, S.J.
Self-schema and self-discrepancy mediate the influence of Instagram usage on body image satisfaction among youth	2017	Ahadzadeh, A.S., Pahlevan Sharif, S., Ong, F.S.
Media ideals and early adolescents' body image: Selective avoidance or selective exposure?	2018	Rousseau A and Eggermont S
"Like" Me: Shopping, self-display, body image, and social networking sites	2018	Strubel, J., Petrie, T.A., Pookulangara, S.
Social Media, Thin-Ideal, Body Dissatisfaction and Disordered Eating Attitudes: An Exploratory Analysis.	2019	Aparicio-Martinez P and Perea-Moreno AJ and Martinez-Jimenez MP and Redel-Macías MD and Pagliari C and Vaquero-Abellan M
Thinspiration and fitspiration in everyday life: An experience sampling study.	2019	Griffiths S and Stefanovski A

Title	Year	Authors
Selfie-viewing and facial dissatisfaction among Chinese adolescents: A moderated mediation model of general attractiveness internalization and body appreciation.	2019	Wang Y and Fardouly J and Vartanian LR and Lei L
Ideal comparisons: Body ideals harm women's body image through social comparison.	2019	Betz DE and Sabik NJ and Ramsey LR
A study of Singapore adolescent girls' selfie practices, peer appearance comparisons, and body esteem on Instagram.	2019	Chang L and Li P and Loh RSM and Chua THH
Facebook, body esteem, and body surveillance in adult women: The moderating role of self-compassion and appearance-contingent self-worth.	2019	Modica C
Body Surveillance on Instagram: Examining the Role of Selfie Feedback Investment in Young Adult Women's Body Image Concerns	2019	Butkowski, C.P., Dixon, T.L., Weeks, K.
#malefitspo: Links between viewing fitspiration posts, muscular-ideal internalisation, appearance comparisons, body satisfaction, and exercise motivation in men	2019	Fatt, S.J., Fardouly, J., Rapee, R.M.
Influence of the mass media and body dissatisfaction on the risk in adolescents of developing eating disorders	2019	Uchôa, F.N.M., Uchôa, N.M., Daniele, T.M.D.C., Lustosa, R.P., Garrido, N.D., Deana, N.F., Aranha, Á.C.M., Alves, N.
The Selfie Generation: Examining the Relationship Between Social Media Use and Early Adolescent Body Image	2019	Salomon, I., Brown, C.S.
Body image flexibility moderates the association between photo-related activities on WeChat moments and the body dissatisfaction of female adolescents in China	2019	Wu, L., Niu, G., Ni, X., Shao, X., Luo, Y.
The association between body image, body mass index and social media addiction among female students at a Saudi Arabia public university	2019	Al Saud, D.F., Alhaddab, S.A., Alhajri, S.M., Alharbi, N.S., Aljohar, S.A., Mortada, E.M.
Body Figure Idealization and Body Appearance Pressure in Fitness Instructors.	2020	Mathisen TF and Aambø J and Bratland-Sanda S and Sundgot-Borgen C and Svantorp-Tveiten K and Sundgot-Borgen J
The prevalence and determinants of body dysmorphic disorder among young social media users: A cross-sectional study.	2020	Alsaidan MS and Altayar NS and Alshmmari SH and Alshammari MM and Alqahtani FT and Mohajer KA
The dark side of Instagram: Predictor model of dysmorphic concerns.	2020	Senín-Calderón C and Perona-Garcelán S and Rodríguez-Testal JF
Social comparisons on social media: online appearance-related activity and body dissatisfaction in adolescent girls.	2020	Scully M and Swords L and Nixon E
Sociocultural factors affecting drive for muscularity among male college students in Malaysia.	2020	Sai A and Furusawa T and Othman MY and Tomojiri D and Wan Zaini WFZ and Tan CSY and Mohamad Norzilan NIB
Examining the self-reported advantages and disadvantages of socially networking about body image and eating disorders.	2020	Cavazos-Rehg PA and Fitzsimmons-Craft EE and Krauss MJ and Anako N and Xu C and Kasson E and Costello SJ and Wilfley DE

Title	Year	Authors
Protect me from my selfie: Examining the association between photo-based social media behaviors and self-reported eating disorders in adolescence.	2020	Lonergan AR and Bussey K and Fardouly J and Griffiths S and Murray SB and Hay P and Mond J and Trompeter N and Mitchison D
Objectified Body Consciousness, Body Image Control in Photos, and Problematic Social Networking: The Role of Appearance Control Beliefs.	2020	Boursier V and Gioia F and Griffiths MD
Unique associations of social media use and online appearance preoccupation with depression, anxiety, and appearance rejection sensitivity.	2020	Hawes T and Zimmer-Gembeck MJ and Campbell SM
Artificial neural networks for predicting social comparison effects among female Instagram users.	2020	Jabłońska MR and Zajdel R
The Associations Between Instagram Use, Selfie Activities, Appearance Comparison, and Body Dissatisfaction in Adult Men.	2020	Modica CA
The relationship between social media use and disordered eating in young adolescents.	2020	Wilksch SM and O'Shea A and Ho P and Byrne S and Wade TD
Use of social networking sites and desire for slimness among 10-year-old girls and boys: A population-based birth cohort study.	2020	Sugimoto N and Nishida A and Ando S and Usami S and Toriyama R and Morimoto Y and Koike S and Yamasaki S and Kanata S and Fujikawa S and Furukawa TA and Sasaki T and Hiraiwa-Hasegawa M and Kasai K
In the eye of the swiper: a preliminary analysis of the relationship between dating app use and dimensions of body image.	2020	Rodgers RF and Campagna J and Attawala R and Richard C and Kakfa C and Rizzo C
Examining the impact of social media on mood and body dissatisfaction using ecological momentary assessment.	2020	Bennett BL and Whisenhunt BL and Hudson DL and Wagner AF and Latner JD and Stefano EC and Beauchamp MT
Appearance-focused media use as a moderator of the relationship between fear of fat and weight bias: an exploratory study.	2020	Bennett BL and Wagner AF and Obleada KT and Latner JD
Selfie posting and self-esteem among young adult women: A mediation model of positive feedback and body satisfaction.	2020	Wang Y and Wang X and Liu H and Xie X and Wang P and Lei L
Gaining likes, but at what cost? Longitudinal relations between young adults' deceptive like-seeking on instagram, peer belonging and self-esteem	2020	Dumas, T.M., Maxwell-Smith, M.A., Tremblay, P.F., Litt, D.M., Ellis, W.
Selfie-posting on social networking sites, body surveillance, and exercise for weight control among Chinese young women with low body mass index	2020	Yao, L., Niu, G., Sun, X., Duan, C., Zheng, Y.
Appearance-Related Social Networking Sites and Body Image in Young Women: Testing an Objectification-Social Comparison Model	2020	Seekis, V., Bradley, G.L., Duffy, A.L.
The relationship between men's peer and social media muscularity ideal discrepancies and body satisfaction	2020	Flynn, M.A., Cotchett, E., Lin, L.

Title	Year	Authors
Relevance of Instagram and Fitspiration images for muscle dysmorphia: Internalization of the male beauty ideal through social media	2020	Schoenenberg, K., Martin, A.
Body talk on social networking sites and body dissatisfaction among young women: A moderated mediation model of peer appearance pressure and self-compassion	2020	Wang, Y., Yang, J., Wang, J., Yin, L., Lei, L.
Instagram selfie-posting and young women's body dissatisfaction: Investigating the role of self-esteem and need for popularity	2020	Kim, M.
Fear the Instagram: Beauty stereotypes, body image and Instagram use in a sample of male and female adolescents	2020	Verrastro, V., Fontanesi, L., Liga, F., Cuzzocrea, F., Gugliandolo, M.C.
The influence of social media on body dissatisfaction among college students.	2021	Alruwayshid MS and Alduraywish SA and Allafi AH and Alshuniefi AS and Alaraik EF and Alreshidi F and Almughais E and Alruwayshid NS
Social media use and postpartum body image dissatisfaction: The role of appearance-related social comparisons and thin-ideal internalization.	2021	Nagl M and Jepsen L and Linde K and Kersting A
Social Media Use and Body Image Disorders: Association between Frequency of Comparing One's Own Physical Appearance to That of People Being Followed on Social Media and Body Dissatisfaction and Drive for Thinness.	2021	Jiotsa B and Naccache B and Duval M and Rocher B and Grall-Bronnec M
Social media, body satisfaction and well-being among adolescents: A mediation model of appearance-ideal internalization and comparison.	2021	Jarman HK and Marques MD and McLean SA and Slater A and Paxton SJ
Adolescents' selfie-activities and idealized online self-presentation: An application of the sociocultural model.	2021	Rousseau A
Possible Effects of Social Media Use on Adolescent Health Behaviors and Perceptions.	2021	Buda G and Lukoševičiūtė J and Šalčiūnaitė L and Šmigelskas K
From filters to fillers: an active inference approach to body image distortion in the selfie era	2021	Tremblay, S.C., Essafi Tremblay, S., Poirier, P.
Concern about appearance on instagram and facebook: Measurement and links with eating disorders	2021	González-Nuevo, C., Cuesta, M., Muñiz, J.
How Self-Compassion Moderates the Links Between Fitspiration Use and Body Concerns in Young Women	2021	Seekis, V., Bradley, G.L., Duffy, A.L.
Links between Exposure to Sexualized Instagram Images and Body Image Concerns in Girls and Boys	2021	Skowronski, M., Busching, R., Krahé, B.
Social media photo activity, internalization, appearance comparison, and body satisfaction: The moderating role of photo-editing behavior	2021	Lee, M., Lee, H.-H.
Social media use impacts body image and eating behavior in pregnant women	2021	Zeeni, N., Abi Kharma, J., Mattar, L.

Labelled “wrong outcome” (N = 3)

Title	Year	Authors
Instagram and college women's body image: Investigating the roles of appearance-related comparisons and intrasexual competition	2017	Hendrickse, J., Arpan, L.M., Clayton, R.B., Ridgway, J.L.
Eye centring in selfies posted on Instagram.	2019	Bruno N and Bertamini M and Tyler CW
Processing Body Image on Social Media: Gender Differences in Adolescent Boys' and Girls' Agency and Active Coping.	2021	Mahon C and Hevey D

Labelled “wrong study design” (N = 9)

Title	Year	Authors
Impact of social media on the health of children and young people.	2015	Richards D and Caldwell PH and Go H
A confound-free test of the effects of thin-ideal media images on body satisfaction	2016	Whyte, C., Newman, L.S., Voss, D.
Pinterest or Thinterest?: Social Comparison and Body Image on Social Media	2016	Lewallen, J., Behm-Morawitz, E.
Male Body Image Portrayals on Instagram.	2020	Gültzow T and Guidry JPD and Schneider F and Hoving C
In Constant Search of "Like": How Technology and Social Media Influence the Perception of our Body.	2021	Barone M and Cogliandro A and Persichetti P
The impact of social media on self-evaluations of men striving for a muscular ideal.	2021	Piatkowski TM and White KM and Hides LM and Obst PL
'When you think of exercising, you don't really want to think of puking, tears, and pain': Young adolescents' understanding of fitness and #fitspiration.	2021	Bell BT and Deighton-Smith N and Hurst M
An Exploration into the Impact of Social Networking Site (SNS) Use on Body Image and Eating Behavior of Physically Active Men	2021	Flannery, O., Harris, K., Kenny, U.A.
“We’re Continually Comparing Ourselves to Something”: Navigating Body Image, Media, and Social Media Ideals at the Nexus of Appearance, Health, and Wellness	2021	Monks, H., Costello, L., Dare, J., Reid Boyd, E.

Labelled “commentary on included studies” (N = 1)

Title	Year	Authors
Does the exposure to 'ideal' facial images on Instagram influence facial and bodily satisfaction?	2021	Alkadhimi A

e) Risk of bias assessment with the RoB2 tool

These tables have been re-built following the excel sheet provided by Cochrane

Unique ID	1	**Study ID**	1	**Assessor**	CDR
Ref or Label	(Brichacek et al., 2018)	**Aim**	assignment to intervention (the 'intention-to-treat' effect)		
Experimental	Intervention	**Comparator**	Control	**Source**	Journal article(s)
Outcome		**Results**		**Weight**	1
Domain	**Signalling question**			**Response**	**Comments**
Bias arising from the randomization process	1.1 Was the allocation sequence random?			NI	Only information given is that the study is randomized.
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?			Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?			N	
	Risk of bias judgement			Low	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?			Y	Participants were aware because pictures can't be blinded
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?			NI	
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?			N	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?			NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?			NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?			Y	

	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	NA	
	Risk of bias judgement	Low	
Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	Y	Less than 5% missing data. Data was missing at random. Statistical assumptions met for all analyses.
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	Low	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	6-item BI States Scale was used for both
	4.3 Were outcome assessors aware of the intervention received by study participants?	NI	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	PY	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	N	
	Risk of bias judgement	Some concerns	
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	Low	

Overall bias	**Risk of bias judgement**	Low	

Unique ID	2	**Study ID**	2	**Assessor**	CDR
Ref or Label	(Brown & Tiggemann, 2016)	**Aim**	assignment to intervention (the 'intention-to-treat' effect)		
Experimental	Intervention	**Comparator**	Control	**Source**	Journal article(s)
Outcome		**Results**		**Weight**	1

Domain	**Signalling question**	**Response**	**Comments**
Bias arising from the randomization process	1.1 Was the allocation sequence random?	NI	Only information given is that participants were randomly assigned
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?	N	
	Risk of bias judgement	Low	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?	Y	Participants were aware because pictures can't be blinded
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	NI	
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	N	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?	NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?	NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Y	

	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	NA	
	Risk of bias judgement	Low	
Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	PY	
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	Low	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	NI	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	PY	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	N	
	Risk of bias judgement	Some concerns	
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	NI	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	NI	
	5.3 ... multiple eligible analyses of the data?	NI	
	Risk of bias judgement	Low	

Overall bias	Risk of bias judgement	Low	

Unique ID	3	Study ID	3	Assessor	CDR
Ref or Label	(Dignard & Jarry, 2021)	Aim	assignment to intervention (the 'intention-to-treat' effect)		
Experimental	Intervention	Comparator	Control	Source	Journal article(s)
Outcome		Results		Weight	1

Domain	Signalling question	Response	Comments
Bias arising from the randomization process	1.1 Was the allocation sequence random?	Y	Participants were randomized using Fluid Surveys Random allocation procedures.
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?	N	
	Risk of bias judgement	Low	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?	Y	Administration in computer-randomized order with software, Participants were aware because pictures can't be blinded
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	N	
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	N	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?	NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?	NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Y	

	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	NA	
	Risk of bias judgement	Low	
Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	PY	
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	Low	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	Y	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	PY	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	N	
	Risk of bias judgement	Some concerns	
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	Low	

Overall bias	**Risk of bias judgement**	Low	

Unique ID	4	Study ID	4	Assessor	CDR
Ref or Label	(Fardouly & Rapee, 2019)	Aim	assignment to intervention (the 'intention-to-treat' effect)		
Experimental	Intervention	Comparator	Control	Source	Journal article(s)
Outcome		Results		Weight	1
Domain	**Signalling question**			**Response**	**Comments**
Bias arising from the randomization process	1.1 Was the allocation sequence random?			Y	Participants were randomized using Qualtrics Software.
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?			Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?			N	
	Risk of bias judgement			Low	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?			Y	Conditions assigned via qualtrics, Participants were aware because pictures can't be blnded
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?			N	
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?			N	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?			NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?			NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?			Y	

	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	NA	
	Risk of bias judgement	Low	
Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	Y	Only 4% missing data
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	Low	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	NI	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	PY	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	N	
	Risk of bias judgement	Some concerns	
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	Low	

Overall bias	Risk of bias judgement	Low	

Unique ID	5	Study ID	5	Assessor	CDR
Ref or Label	(McComb & Mills, 2021)	Aim	assignment to intervention (the 'intention-to-treat' effect)		
Experimental	Intervention	Comparator	Control	Source	Journal article(s)
Outcome		Results		Weight	1

Domain	Signalling question	Response	Comments
Bias arising from the randomization process	1.1 Was the allocation sequence random?	NI	Only info given is that allocation was randomly but no randomization method stated. Participants were randomly assigned to either the control or experimental condition prior to arriving at the lab.
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?	Y	However,because there were baseline differences in appearance dissatis-faction between the experimental conditions, we decided to also run ANCOVAs to test for between group differences in Time 2appearance dissatisfaction, weight dissatisfaction, and confidence,while controlling for Time 1 scores as covariates, to ensure ourfindings were not biased by baseline differences.
	Risk of bias judgement	Some concerns	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?	Y	Participants were aware because pictures can't be blinded
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	NI	
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	N	

	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?	NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?	NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Y	
	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	NA	
	Risk of bias judgement	Low	
Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	Y	
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	Low	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	NI	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	PY	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	N	
	Risk of bias judgement	Some concerns	

Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	Low	
Overall bias	**Risk of bias judgement**	Low	

Unique ID	6	**Study ID**	6	**Assessor**	CDR
Ref or Label	(Prichard et al., 2020)	**Aim**	assignment to intervention (the 'intention-to-treat' effect)		
Experimental	Intervention	**Comparator**	Control	**Source**	Journal article(s)
Outcome		**Results**		**Weight**	1
Domain	**Signalling question**			**Response**	**Comments**
Bias arising from the randomization process	1.1 Was the allocation sequence random?			Y	Participants were randomized using Qualtrics Software.
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?			Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?			N	
	Risk of bias judgement			Low	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?			Y	As one condition included running on the treadmill, the carers knew which group they were belonging to, Participants were aware because pictures can't be blinded
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?			Y	

	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	N	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?	NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?	NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Y	
	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	NA	
	Risk of bias judgement	Low	
Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	Y	
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	Low	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	NI	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	PY	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	N	
	Risk of bias judgement	Some concerns	

Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	Low	
Overall bias	**Risk of bias judgement**	Low	

Unique ID	7	**Study ID**	7	**Assessor**	CDR
Ref or Label	(Sampson et al., 2020)	**Aim**	assignment to intervention (the 'intention-to-treat' effect)		
Experimental	Intervention	**Comparator**	Control	**Source**	Journal article(s)
Outcome		**Results**		**Weight**	1
Domain	**Signalling question**			**Response**	**Comments**
Bias arising from the randomization process	1.1 Was the allocation sequence random?			Y	Participants were randomly divided by simple computerized list randomization
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?			Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?			N	
	Risk of bias judgement			Low	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?			Y	Participants were aware because pictures can't be blinded
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?			Y	
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?			N	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?			NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?			NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?			Y	
	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?			NA	
	Risk of bias judgement			Low	

Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	Y	
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	Low	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	NI	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	PY	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	N	
	Risk of bias judgement	Some concerns	
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	Low	
Overall bias	**Risk of bias judgement**	Low	

Unique ID	8	**Study ID**	8	**Assessor**	CDR
Ref or Label	(Tiggemann & Anderberg, 2020)	**Aim**	assignment to intervention (the 'intention-to-treat' effect)		
Experimental	Intervention	**Comparator**	Control	**Source**	Journal article(s)
Outcome		**Results**		**Weight**	1
Domain	**Signalling question**			**Response**	**Comments**
Bias arising from the randomization process	1.1 Was the allocation sequence random?			Y	Participants were randomized using Qualtrics Software.
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?			Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?			N	
	Risk of bias judgement			Low	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?			Y	Participants were aware because pictures can't be blinded
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?			NI	
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?			N	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?			NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?			NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?			Y	
	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?			NA	
	Risk of bias judgement			Low	

Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	PY	
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	Low	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	NI	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	PY	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	N	
	Risk of bias judgement	Some concerns	
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	Low	
Overall bias	**Risk of bias judgement**	Low	

Unique ID	9	**Study ID**	9	**Assessor**	CDR
Ref or Label	(Tiggemann & Zaccardo, 2015)	**Aim**	assignment to intervention (the 'intention-to-treat' effect)		
Experimental	Intervention	**Comparator**	Control	**Source**	Journal article(s)
Outcome		**Results**		**Weight**	1
Domain	**Signalling question**			**Response**	**Comments**
Bias arising from the randomization process	1.1 Was the allocation sequence random?			NI	Only information given is that participants were randomly assigned
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?			Y	
	1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?			N	
	Risk of bias judgement			Low	
Bias due to deviations from intended interventions	2.1.Were participants aware of their assigned intervention during the trial?			Y	Participants were aware because pictures can't be blinded
	2.2.Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?			NI	
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?			N	
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?			NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?			NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?			Y	
	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?			NA	
	Risk of bias judgement			Low	

Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	Y	
	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	Risk of bias judgement	Low	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	
	4.3 Were outcome assessors aware of the intervention received by study participants?	NI	
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	PY	
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	N	
	Risk of bias judgement	Some concerns	
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	
	5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	
	5.3 ... multiple eligible analyses of the data?	N	
	Risk of bias judgement	Low	
Overall bias	**Risk of bias judgement**	Low	

f) PRISMA 2020 Checklist with indication on reported items

Section and Topic	Item #	Checklist item	Chapter where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Cover
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	2
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	3
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	4.1
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	4.2
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	4.3
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	4.4
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	4.5
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	4.6
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	4.6
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	4.7
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	4.8
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	4.9
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	

Section and Topic	Item #	Checklist item	Chapter where item is reported
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	4.10
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	4.11
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	5.1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	5.1
Study characteristics	17	Cite each included study and present its characteristics.	5.2
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	5.3
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	5.5
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	5.6
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	5.6
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	-
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	-
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	5.3
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	5.4
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	6.2
	23b	Discuss any limitations of the evidence included in the review.	6.2

Section and Topic	Item #	Checklist item	Chapter where item is reported
	23c	Discuss any limitations of the review processes used.	6.1
	23d	Discuss implications of the results for practice, policy, and future research.	6.3
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	-
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	-
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	-
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Funding
Competing interests	26	Declare any competing interests of review authors.	Funding
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Appendix

Statutory declaration

I declare that I have authored this thesis independently, that I have not used other than the declared sources / resources, and that I have explicitly marked all material which has been quoted either literally or by content from the used sources.

Hamburg,