

REVIEW

Social media, body image and food choices in healthy young adults: A mixed methods systematic review

Kim Rounsefell APD, PhD Candidate¹  |

Simone Gibson PhD, AdvAPD, Senior Lecturer¹  |

Siân McLean PhD, Research Fellow^{2,3}  | Merran Blair APD, Research Assistant¹  |

Annika Molenaar BNutSc (Hons), Research Officer¹  |

Linda Brennan PhD, Professor of Advertising⁴  |

Helen Truby PhD, Director of Dietetics¹  | Tracy A. McCaffrey PhD, Senior Lecturer¹ 

¹Department of Nutrition, Dietetics and Food, Monash University, Melbourne, Victoria, Australia

²Institute for Health and Sport, Victoria University, Melbourne, Victoria, Australia

³School of Psychology and Public Health, La Trobe University, Melbourne, Victoria, Australia

⁴School of Media and Communication, RMIT University, Melbourne, Victoria, Australia

Correspondence

Tracy A. McCaffrey and Helen Truby,
 Department of Nutrition, Dietetics and Food,
 Monash University, Level 1 264 Ferntree
 Gully Road, Melbourne VIC 3168 Australia.
 Email: tracy.mccaffrey@monash.edu
 (T. A. M.) and helen.truby@monash.
 edu (H. T.)

Funding information

National Health and Medical Research
 Council, Grant/Award Number:
 GNT1115496

[Correction added on 14 October 2019, after
 first online publication: The affiliations of
 authors Siân McLean and Linda Brennan
 have been corrected].

The copyright line for this article was
 changed on 9 May 2020 after original
 online publication.

Abstract

Aim: Negative body image increases the risk of engaging in unhealthy dieting and disordered eating patterns. This review evaluated the impact of habitual social media engagement or exposure to image-related content on body image and food choices in healthy young adults (18–30 years).

Methods: A systematic search of six databases of observational literature published 2005–2019, was conducted (PROSPERO Registration No. CRD42016036588). Inclusion criteria were: studies reporting social media engagement (posting, liking, commenting) or exposure to image-related content in healthy young adults. Outcomes were: body image (satisfaction or dissatisfaction) and food choices (healthy eating, dieting/restricting, overeating/binging). Two authors independently screened, coded and evaluated studies for methodological quality.

Results: Thirty studies were identified (n = 11 125 participants). Quantitative analysis (n = 26) identified social media engagement or exposure to image-related content was associated with higher body dissatisfaction, dieting/restricting food, overeating, and choosing healthy foods. Qualitative analysis (n = 4) identified five themes: (i) social media encourages comparison between users, (ii) comparisons heighten feelings about the body, (iii) young adults modify their appearance to portray a perceived ideal image, (iv) young adults are aware of social media's impact on body image and food choices, however, (v) external validation via social media

is pursued. Most studies ($n = 17$) controlled for some confounding variables (age, gender, BMI, ethnicity).

Conclusions: Social media engagement or exposure to image-related content may negatively impact body image and food choice in some healthy young adults. Health professionals designing social media campaigns for young adults should consider image-related content, to not heighten body dissatisfaction.

KEYWORDS

body image, disordered eating, self-objectification, social comparison, social media, social networking sites

1 | INTRODUCTION

Young adulthood (18-30 years) marks the transitional period between adolescence and adulthood.¹ It is an impressionable life stage as young adults develop new skills toward their independence yet remain vulnerable due to a lack of life experience.² Young adulthood is a pivotal time to intervene to promote healthy food choices. They are among the largest consumers of sugar-sweetened beverages and fast food, and have low fruit and vegetable intakes.³⁻⁷ These modifiable food choice behaviours carry long term health implications such as increased risk of chronic metabolic diseases (eg, cardiovascular diseases and diabetes mellitus).⁸

Due to the exponential growth in social media (SM) use over the last decade,⁹ nutrition and health professionals, government and non-government health organisations (health professionals) try to leverage SM to reinforce healthy food choices and nutrition-related behaviours in young adults.¹⁰⁻¹² However, health campaigns utilising social media and targeting young adults have suffered from poor engagement and high attrition rates.¹³⁻¹⁵ In addition, content from health professionals must compete against sophisticated social marketing campaigns of corporate brands and food industries.^{16,17} SM content is poorly regulated, and food and beverage organisations are known to exploit young adults' social vulnerabilities using image-based marketing tactics, including peer ambassadors and celebrity endorsements designed to sell an illusion of health, beauty and success from products they are offering.¹⁶ Evidence is now emerging of the negative consequences of such content for body image (BI) concerns, particularly in young women.^{18,19}

Body image is experienced on a continuum from positive to negative. People with negative BI (body dissatisfaction) feel dissatisfied with their appearance, and perceive a discrepancy between their current appearance and ideal appearance.^{20,21} The more dissatisfied a person feels about their body, the higher their risk of experiencing low self-esteem depression,²² and poor quality of life.^{23,24} Negative BI increases the likelihood of engaging in disordered eating

behaviours including dieting, binge eating, fasting, calorie counting, and self-induced vomiting²⁵ with numerous serious long-term health consequences.²⁶ Recognition of these negative consequences emphasises the importance of promoting and supporting positive BI in young adults to optimise health and wellbeing.

One forum through which appearance-related content is presented is SM platforms.¹² Approximately 90% of young adults in Australia,²⁷ and the United States,⁹ use SM platforms, the majority on a daily basis,²⁸ either in a passive or active form (Appendix S4). SM use can also be categorised as positive or negative. For the current review, users that are seeking reassurance or engaging in negative body fat talk (eg, "I look fat") with others online are defined as engaging negatively on SM.²⁹

Theoretical perspectives that provide insight into the relationship between SM engagement and exposure to image-related content on BI are social comparison theory and objectification theory. Comparisons made with peers perceived as being more attractive, or thinner (upward comparisons) are an established precursor of body dissatisfaction.^{18,30} A predisposition to engage in social comparisons on SM may be an underlying mechanism (herein referred to as mediator) influencing the development of BI dissatisfaction.^{18,31} Objectification theory proposes that the sexual portrayal of women in society promotes a culture where women are seen as objects for the viewing pleasure of others.³² It is suggested that these influences acclimatise women in particular, to engage in self-objectification. Self-objectification refers to the degree that a person internalises a third-person perspective of themselves and becomes preoccupied with how their body looks to peers. This can result in habitual monitoring of their bodies' appearance. Social networking sites provide opportunities for young adults to engage in self-objectification behaviours by uploading photos of themselves that invite comments and reactions from others.¹⁸

These theories are not just applicable to women, as men also engage in self-objectifying behaviours on SM.^{33,34} For example, young adult men reported that showcasing fashion choices on SM was a means of expressing

themselves for which they receive appearance-related evaluations (eg, “looking good man”) on images posted.³⁵ The portrayal of inspirational fitness images (fitspiration), thin bodies (thin-ideal), and evocative food images on SM are also evidence of this phenomena.^{36,37} Engaging in self-objectifying behaviours on SM may act as a mediator in the development of body dissatisfaction as long-term manifestations of self-objectification include body shame, body surveillance, appearance anxiety, internalisation of the thin-ideal and increased risk of disordered eating behaviours.³⁸

Despite emerging evidence linking SM to BI and the implications of negative BI on health and wellbeing, there is limited evidence to date that explores the relationship between SM, BI and food choice in young adults. A previous systematic review of experimental and observational literature reported that exposure to social networking sites was associated with negative BI and disordered eating behaviours in children, pre-adolescent, adolescent and young adult populations in community, school and college settings.³⁹ A limitation of using experimental literature to evaluate the effects of SM exposure is that it is difficult to mimic the ever-evolving SM environment to which young adults are exposed.¹⁹ Therefore, this review evaluates the observational literature consisting of both qualitative and quantitative studies. This area of research is evolving rapidly and updated exploration of SM engagement or exposure to image-related content in a young adult population exclusively is in progress.⁴⁰

The aims of the current review were to systematically search the existing literature in order to summarise: the impact of engagement (eg, sharing, commenting, liking) and/or exposure to any image-related content (eg, images, photos and videos) via SM on BI (satisfaction or dissatisfaction) in young adults and explore how exposure influences food choices (eg, dieting, healthy eating or overeating).

2 | METHODS

This was a mixed method systematic review of observational quantitative and qualitative studies. Study design, implementation, analysis, and reporting followed The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) protocol.⁴¹ The systematic review protocol was registered in PROSPERO (Registration No. CRD42016036588) March 2016.

Inclusion criteria were studies that involved healthy young adults (aged 18-30 years) of any body mass index (BMI kg/m²), using SM (online blogs, microblogs, content communities, or social networking sites) for engagement (eg, sharing, commenting, liking), or image-related activities (eg, viewing, posting, or engaging with images). Observational studies that explored habitual SM use were included. The outcomes of interest were the impact on BI (satisfaction or dissatisfaction),

or a diet-related health behaviour (measures of healthy eating, dieting/restricting, overeating/bingeing). Search criteria were restricted to peer-reviewed papers published in English between 2005 and July 2019. These dates coincide with the increasing popularity of SM.⁹ Exclusion criteria were studies that involved young adults with pre-diagnosed chronic illness, psychological disorders, eating disorders, internet addiction or partaking in risky health behaviours (eg, smoking, heavy alcohol, drug use). Studies evaluating exposure to pro-eating disorder sites were also excluded as this content may attract participants with existing BI dissatisfaction.¹⁸ Experimental studies were also excluded as they did not constitute habitual SM use.

A systematic search in CINHAL Plus, Cochrane, OVID Medline, PsychINFO, Scopus, and Sociological Abstracts databases was initially completed in May 2018 and updated on 6th July 2019. Search terms included a keyword combination of population terms AND SM terms AND BI or food choice terms. Food choice was an umbrella term to describe foods and beverages that young adults consumed and their eating habits (eg, snacking, dieting, restricting, and overeating). This term reflects the observational literature examined, as long-term eating behaviours are unable to be determined. An example search term is “young adult” AND “social network” AND “body dissatisfaction or diet”. The complete Boolean keyword search strategy used is shown in Table 1. Search terms were altered to suit the individual requirements of each database including MeSH terms. The database search strategy is in Appendix S1, Supporting Information.

Study records were managed using Covidence systematic review software (Veritas Health Innovation, Melbourne, Australia). Search results were imported with duplicate records automatically removed. Two investigators (KR and SS, MB or AM) independently screened citations (title, abstract) against inclusion and exclusion criteria. A third investigator independently screened conflicting citations (TM). Two investigators (KR and SS, AM or MB) independently assessed full-text articles for eligibility against inclusion and exclusion criteria. Excluded papers were coded as either “not a population of interest”, “not an intervention of interest”, or “not an outcome of interest”. Discrepancies were discussed between investigators (KR and SS, MB or AM) and resolved by consensus. Conference proceedings and dissertations were flagged and later excluded from analysis as their level of peer review was unknown.

A data extraction template was created and tested to extract data from quantitative and qualitative studies. One investigator (KR) independently extracted data from all included studies. Secondary independent data extraction was completed in duplicate (TM, SG, KK or MB). Discrepancies were discussed between investigators (KR, TM, SG, KK, MB) and resolved by consensus. Data extracted for analysis included; reference details, study design (type, sample size, setting, recruitment

Population	Exposure	Comparison	Outcome
“young adult*”, “young women”, “young men”, “young people”, “young individual*”, youth, teen*, undergraduate*, student*, school- aged, adolescen*	“social media”, “social network*”, “social medium”, facebook, Instagram, twitter, tweet*, google*, myspace, Pinterest, Tumblr, LinkedIn, snap chat, youtube, blog*, “web site*”, internet, smartphone*, “mobile app”	n/a	“body image”, preoccupation, “body dissatisfaction”, “body satisfaction”, appearance, thinness, “health behav*”, “behav*r change”, “ideal weight”, “body weight”, “weight control*”, diet, “eating behav*”, “eating disorder”, bingeing, fasting, bulimia, anorexia, orthorexia, overeat*

*Denotes truncation of search term.

method, response rate, SM channel, SM engagement or image-related exposure measure, BI measure, food choice measure), mediators between SM engagement/exposure and BI and eating behaviours (social comparison, objectification), population characteristics (age, gender, ethnicity) and key findings. For qualitative outcomes, two investigators (KR, MB) independently extracted and coded qualitative results data. Investigators then came together (KR, MB and SG) to discuss codes and group into themes associated with factors influencing SM engagement or exposure to image-related content on young adults' BI and food choices.

Two quality assessment tools were used to evaluate the risk of bias and were each conducted independently by two researchers. Discrepancies were discussed between investigators (KR and KK or MB) and resolved by a third independent reviewer (TM). The Agency for Healthcare Research and Quality (ARHQ) Methodology Checklist for Cross-Sectional/Prevalence Study tool⁴² was used to evaluate quantitative observational studies. The 11-item tool used a “yes”, “no” or “unclear” rating to assess the quality of data collection, analysis and reporting. Quality in Qualitative Evaluation: A Framework for Assessing Research Evidence was used to evaluate qualitative studies.⁴³ The 18-item tool appraised contribution, design rigour and credibility of conclusions drawn.

Qualitative and quantitative results were synthesised according to study quality, population demographics, study characteristics, and BI and food choice outcomes. Qualitative and quantitative results were then interpreted together in the discussion.

3 | RESULTS

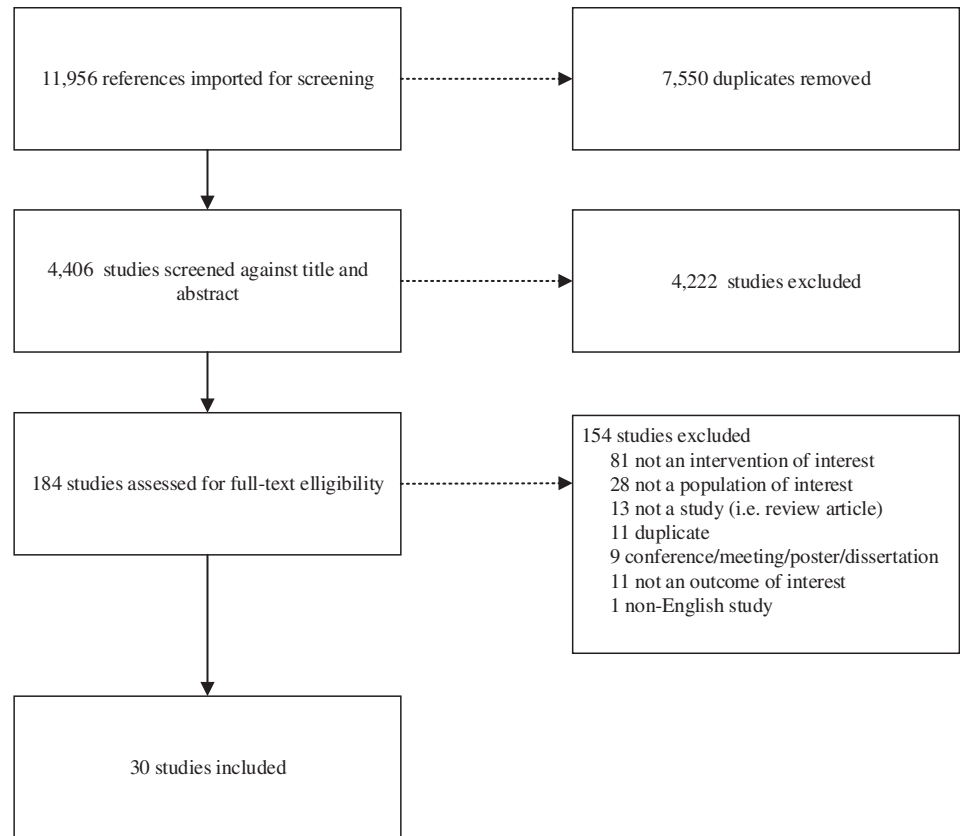
The literature search retrieved 11,956 references, with 30 studies meeting the inclusion criteria (Figure 1). Table 2

TABLE 1 PICO search criteria for systematic review of social media exposure for effects on body image and food choices

provides a summary of the 30 eligible studies (26 quantitative, 4 qualitative).

Quality assessment of cross-sectional studies (Appendix S2)⁴² identified that the majority of studies had clearly defined inclusion and exclusion criteria. Reasons for exclusion of participants in analysis and adjustment for confounding variables were also incorporated in many studies. However, many studies did not identify pertinent information including a time-period of data collection, and participant response rates. The assessment of the quality of qualitative studies⁴³ identified that findings in all studies were supported by the evidence with clearly stated purpose, data collection methods with relevant appraisal and conclusions made. However, studies lacked detail contextualising their data sources and the backgrounds of researchers involved in studies. There was also little information provided of ethical, interview and focus group procedures. One study did not report any study limitations.⁴⁴

Quantitative studies primarily recruited participants from university cohorts ($n = 23$),⁴⁵⁻⁶⁷ of which three were psychology cohorts^{52,53,61} with the majority based in the USA,^{22,23,40-52,66} followed by Australia.^{48,49,51-53} Three studies recruited participants in community settings ($n = 3$).⁶⁸⁻⁷⁰ Study sample size ranged from 100 to 1104 participants with a mean age of 18.5 to 25.78 years, of which 84% were female. Where ethnicity was reported in studies ($n = 23$), participants were mostly Caucasian.^{46-59,61,62,64,66,68,70} Of the 12 studies that reported BMI,^{45,48,49,51-53,57,63-65,67,70} participants had a mean range between 20.26 and 28.24 kg/m². A variety of tools to measure BI and eating behaviour were used, with little overlap between the studies (Appendix S3). However, the Eating Disorder Examination Questionnaire (EDEQ),^{52,57,58,62,64} Eating Disorder Inventory (EDI),^{48,49,51-53,56,59,62,67,70} Objectified Body Consciousness (OBC-Y)^{46,48,49,54,55,61,65,67,69,70}

FIGURE 1 PRISMA flow diagram

and Physical Appearance Comparison Scale (PACS)^{46-48,53,59,65,66,69,71} were the most frequently utilised measures.

The following sections report findings from included studies. Eight studies reported the impact of SM engagement on BI and food choice ($n = 8$);^{54,55,57-62} 10 studies reported the impact of exposure to image-related content on BI and food choice ($n = 10$);^{45,47,49,51-53,63,65,67,69} and eight studies reported the impact of both SM engagement and exposure to image related content on BI and food choice outcomes ($n = 8$).^{46,48,50,56,64,66,68,70}

Associations between SM engagement and BI and food choice outcomes were examined in 31% of studies^{54,55,57-62}; Facebook was the most commonly used social networking site ($n = 6$),^{55,57-59,61,62} followed by Instagram ($n = 2$).^{54,57} Engagement was measured as either neutral engagement (eg, passive or active use^{54,55,61}) or negative engagement (eg, maladaptive use,^{58,62} and reassurance seeking⁵⁷). Negative SM engagement (reassurance seeking⁵⁷ and maladaptive Facebook use^{58,62}) was associated with higher body dissatisfaction and disordered food choices^{57,58,62} including eating restraint⁵⁸ in both female^{57,58,62} and male⁵⁸ college cohorts. Differences were identified based on ethnicity in two studies (Table 2).^{57,60}

Associations between exposure to image-related content and BI^{45,47,49,51-53,63,67,69} and food choice ($n = 4$)^{46,49,52,65} outcomes were measured in 42% of studies. Instagram

($n = 5$),^{45,47,51,63,67} followed by Facebook ($n = 3$)^{53,67,69} were the most commonly investigated platforms. Image-related exposures were categorised as non-specific images^{52,69} (image type not specified in results) or idyllic images^{45,47,49,51,53,63} (celebrities, friends or peers portraying perfect lifestyles,^{45,51,53} and selfies^{47,49,63,65,67}). Exposure to non-specific images was associated with higher body dissatisfaction on Facebook.⁶⁹ While exposure to idyllic images including fitness posts,⁵¹ celebrities⁴⁵ and peers,^{51,53} portraying perfect lifestyles was associated with higher body dissatisfaction,⁵¹⁻⁵³ and drive for thinness.^{51,53} Selfie exposure (to self-photos) yielded mixed results^{47,49,63,65,67} with greater exposure associated with higher body dissatisfaction among Australian female university students,⁴⁹ however, there was no association among USA male and female college students.^{47,63} Female USA college students taking (but not posting) selfies were associated with higher body dissatisfaction.⁶³ A greater predisposition to engage in physical comparisons mediated relationships between image-related exposure and body dissatisfaction,^{51-53,69} drive for thinness,^{51,53} increased dieting.⁵² This finding was consistent across all SM platforms, cohorts, genders and locations.^{51,53,69,71} Comparisons made with female celebrities, had higher associations to body dissatisfaction followed by comparisons with close friends and distant peers.⁵³

Associations between both SM engagement and exposure to image-related content and BI^{46,48,50,56,66,68,70} and food

TABLE 2 Study characteristics and results of social media engagement and exposure to image-related content on body image and food choice outcomes in healthy young adults

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Howard et al ⁵⁷	USA	CS, S	n (%F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Facebook Instagram Twitter	Frequency of SNS use Reassurance Seeking Scale (a)	Body Shape Questionnaire (BSQ-16) Eating Disorder Examination Questionnaire (EDE-Q)	African American women used Facebook less but had the same Twitter and Instagram use compared to white women. African American women experienced lower body dissatisfaction and disordered eating than white women. Frequency of Facebook use associated with body dissatisfaction but not Twitter or Instagram (no differences between ethnicity). Engaging in higher reassurance seeking increased body dissatisfaction and disordered eating (no differences between ethnicity).
Hummel et al ⁵⁸	USA	CS, S	n (%F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Facebook	Maladaptive Facebook Questionnaire Status updates and comments coded for positive and negative emotions. Food choices Eating Disorder Examination Questionnaire (EDEQ-4)	Body Image Eating Disorder Examination Questionnaire (EDEQ-4) Subscales Restraint, and Eating Concern.	Participants who wrote revealing status updates with negative comments had greater shape and eating concerns. Participants with a feedback seeking style and high number of comments were more likely to report eating restraint. Receiving negative comments from personal status updates predicted eating concerns.
Smith et al ⁶²	USA	CS, S	n (%F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Facebook	Maladaptive Facebook Usage Scale	Body Image Body Dissatisfaction Subscale (EDI) Shape Concern Subscale (EDEQ-4).	Maladaptive Facebook use predicted increased body dissatisfaction and shape concern.

(Continues)

TABLE 2 (Continued)

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Feltman et al ⁵⁴	USA	CS, S	n (%F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Instagram	Passive Use Active Use	Body Surveillance Subscale (OBSC) Internalisation Subscale (SATAQ-3) Upward and Downward Appearance Comparison Scale Appearance-Related Commentary (RD) Social Networking Appearance-Related Commentary Scale (SNARCS) (RD) Self-Objectification Questionnaire (SOQ)	Active and passive Instagram use positively correlated with self-objectification, body surveillance, upward and downward appearance comparisons and positive appearance commentary. The internalisation of cultural beauty standards and engaging in upward appearance comparisons mediated the association between Instagram use with body surveillance and self-objectification. Positive and negative commentary and downward appearance comparisons did not mediate the association between Instagram, use, self-objectification and body surveillance.
Hanna et al ⁵⁵	USA	CS, S	n (%F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Facebook	Time spent using Facebook minutes-hours Passive Facebook Use Active Facebook Use	State Self-Esteem Scale (SSES) Iowa Netherlands Comparison Orientation Measure Body Surveillance subscale (OBC-Y)	Time spent on Facebook was inversely associated with self-esteem, and positively associated with social comparison, depression, anxiety and body shame.

(Continues)

TABLE 2 (Continued)

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Kim et al ⁵⁹	USA	CS, S	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Facebook	Utz and Beukeboom's SNS use for Grooming Scale ^a Time spent on Facebook/day	Drive for Thinness (EDI) Drive for Muscularity (DMS) Physical Appearance Comparison Scale (PACS)	Men reported greater drive for muscularity than women. Women reported greater drive for thinness. Women are more likely to engage in appearance comparisons. Social grooming behaviours positively associated with the drive for thinness and appearance comparisons. Appearance comparisons mediated Facebook use with social grooming and drive for thinness. Time spent on Facebook not associated with appearance comparison, drive for thinness or drive for muscularity.
Lee et al ⁶⁰	USA/Korea	CS, S	n (%F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Social Media	Social media use for information (eg, fashion, exercise.) Social media use for status seeking Social media use for socialising (posting, comments)	Body-Esteem Scale for Adolescents and Adults Rosenberg's Self-esteem Scale Ryff's (1989) psychological wellbeing scale	Social media information seeking negatively affected body image in both US and Korean participants, but was not significant in the Korean cohort. Social media use for status seeking and socialising did not change body image in US participants. Social media use for status seeking positively affected body image in Korean participants with socialising having no effect.

(Continues)

TABLE 2 (Continued)

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Manago et al ⁶¹	USA	CS, S	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Facebook	Facebook Involvement: Time spent/day Facebook Intensity Scale Passive Use (viewing stories, liking) Active Use (posting, status updates)	Objectified Body Consciousness: Gordon and Ward Self-Worth Measure Body Shame Subscale (OBC-Y) Body Surveillance Subscale (OBC-Y) Enjoyment of Sexualisation Scale	Women reported higher levels of Facebook involvement, body shame and appearance self-worth than men. Women and men with high Facebook involvement (passive/active use) reported greater objectified body consciousness. Objectified body consciousness predicted greater body shame in women and men.
Fardouly et al ⁵²	AUS	CS, S	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Social Media	Participants periodically asked by text message if they made appearance comparisons, and their context (eg, Social Media).	Body Image Body Dissatisfaction Subscale (EDI) Appearance Subscale (SSES) Appearance Comparisons: Frequency/Nature/Direction ^b Food choices 2 adapted questions from (EDEQ) on restraint and diet behaviour.	10% appearance comparisons made through social media. Participants reported more upward social media comparisons than lateral or downward comparisons. Engaging in upward social media comparisons associated with less appearance satisfaction. Social media comparisons associated with more dieting thoughts and diet-related behaviours.
Cohen et al ⁴⁹	AUS	CS, S	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	SNS	Time spent SNS/day Selfie Activities (taking/sharing) Photo Investment Scale Photo Manipulation Scale	Body Image: Internalisation Subscale (SATAQ-3) Appearance Evaluation Subscale (MBSRQ) Body Surveillance Subscale (OBCS) Drive for Thinness (EDI) Eating Behavior Bulimia Subscales (EDI)	64% use SNS 2 hours/day. 48.7% take selfies at least once /fortnight. 62.2% edit photos. 80.7% do not edit photos. Selfie posting negatively correlated with body satisfaction. Photo investment positively correlated with thin-ideal internalisation, drive for

(Continues)

TABLE 2 (Continued)

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Ahadzadeh et al ⁴⁵	Malaysia	CS, OS	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Instagram	Time (minute, hour) Following celebrities (yes/no) Number/type of pictures posted	Body Areas Satisfaction Scale (BASS) Body Image Ideals Questionnaire (BIQ) Appearance Schemas Inventory (ASI-R) Rosenberg Self-Esteem Scale (RSES)	thinness and bulimia symptoms. Photo investment negatively correlated with body satisfaction. Selfie behaviours did not predict drive for thinness. Self-objectification mediated photo investment and bulimia symptoms. Instagram use was inversely associated with body satisfaction.
Barry et al ⁴⁷	USA	CS, S, SMO	n (%F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Instagram	30-day Content Analyses (posts, followers, following) Coding included (selfie, non-selfie, photo of participant [posie], no participant)	Rosenberg Self-Esteem Scale (RSES) Physical Appearance Comparison Scale (PACS) Sociocultural Attitudes Toward Appearance (SATAQ3).	Greater selfies and poses not significantly associated with preoccupation with physical appearance standards. Physical appearance selfies not significantly associated with physical appearance concerns or self-esteem.
Fardouly et al ⁵¹	AUS/USA	CS, S	n (%F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Instagram	Instagram checked/day Time Spent/day How often inspiration images viewed Frequency comparisons to female groups (family, friends, acquaintances, strangers, celebrities, themselves)	Internalisation Subscale (SATAQ-3) Upward and Downward Appearance Comparison Scale Body Dissatisfaction Subscale (EDI) Drive for Thinness subscale (EDI) Self-Objectification Questionnaire (SOQ)	Instagram checked 1x daily—every few hours. Approx. 30 minutes spent on Instagram. Comparisons made mostly to friends and celebrities. Instagram use positively correlated with self-objectification and internalization of beauty ideal (not body dissatisfaction, drive for thinness or appearance comparison).

(Continues)

TABLE 2 (Continued)

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Fardouly et al ⁵³	AUS	CS, S	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Facebook	Times spent checking Facebook Physical Appearance Comparison Scale (PACS) ^a Comparison direction for family members, close friends, Facebook friends, friends of friends, celebrities.	Body Dissatisfaction Subscale (EDI) Drive for Thinness Subscale (EDI) Physical Appearance Comparison Scale (PACS) ^a Comparison Scale (PACS) ^a	Greater frequency of checking and Facebook use positively associated with body dissatisfaction and drive for thinness. Appearance comparisons mediated these relationships. Body rated most negatively after comparing to female celebrities followed by close friends and distant peers.
Niu et al ⁶⁵	China	CS	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	WeChat	Selfie posting frequency Verbal Commentary on Physical Appearance Scale (VCOPAS)	Body objectification Objectified Body Consciousness Scale (OBCS) Food choice Restrained Eating subscale from the Dutch Eating Behaviour Questionnaire (DEBQ)	Selfie posting frequency positively correlated with commentary on appearance and self objectification. Selfie posting was positively correlated with restrained eating. Commentary on appearance and self objectification both mediated the relationship between selfie posting frequency and restrained eating.

(Continues)

TABLE 2 (Continued)

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Veldhuis et al ⁶⁷	Netherlands	CS	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Facebook Instagram Twitter Pinterest Tumblr	The photo subscale from Facebook photo-activity scale ^a Photo Selection Scale Editing of selfies ^a Deliberate selfie posting ^b	Body Dissatisfaction Subscale (EDI) ^a Body Appreciation Scale-2 Objectified Body Consciousness Scale (OBCS) Rosenberg Self-Esteem Scale (RSES)	Facebook most popular SNS. Average 1-2 selfies posted per week. Selfie selection was non-significantly associated with increased body appreciation.
Wagner et al ⁶³	USA	CS, S	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Instagram	Number of solo selfies taken and posted in a month.	Body Dimensions (BIAS-BD)	Average of 17 selfies taken and 0.34 selfies were posted during a month. Participant's actual body size positively related to level of body dissatisfaction. Actual body size and body dissatisfaction predicted the number of selfies taken. Low BMI or greater body dissatisfaction predicted more selfies taken. Actual body size and body dissatisfaction not related to number of selfies uploaded.
Xiaoqing ⁶⁹	China	CS, S	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Facebook	Facebook photo-activity scale Online appearance interactions Online appearance presentation	Internalisation Subscale (SATAQ-3) Body Surveillance Subscale (OBCS) Physical Appearance Comparison Scale (PACS) Female Weight Satisfaction Subscale (BES) Muscularity and Body Fat subscales of (male body attitudes scale)	Social media appearance interaction positively associated with both men's and women's body dissatisfaction. Social comparison mediated the relationship between men's online appearance interaction and body dissatisfaction.

(Continues)

TABLE 2 (Continued)

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Arroyo et al ¹⁶	USA	CS, OS	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	SNS—Facebook, Instagram, Twitter Pinterest	Frequency of SNS exposure Viewing friends fitness posts (eg, food, before/after photos) Negative Body Talk Scale (NBT) ^a	Body Image Body-Esteem Scale for Adolescents and Adults (BESAA) Physical Appearance Comparison Scale (PACS) Body Surveillance Subscale (OBC-Y) Food choice Exercise and Diet Subscale (HPS) ^a	Friends' fitness posts negatively associated with body satisfaction. Friends' fitness posts positively associated with healthy eating and negative body talk. Social comparison moderates friends' fitness posts and negative body talk. Women engage in healthy eating behaviours and negative body talk more than men.
Butkowski et al ⁷⁰	International sample Researchers from USA	CS	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Instagram	Selfie feedback investment ^a Frequency of Instagram use Frequency of selfie posting	Body Image Body Dissatisfaction Subscale (EDI) Drive for Thinness Subscale (EDI) Body Surveillance Subscale (OBCS) Food choice Bulimia Subscale (EDI) Bulimia action tendencies	Selfie feedback investment positively correlated with drive for thinness, body surveillance and selfie posting frequency. Selfie posting frequency negatively correlated with body dissatisfaction. Bulimia action tendencies positively correlated with body surveillance. Neither selfie feedback investment nor selfie posting frequency was correlated with bulimia action tendencies.
Eckler et al ⁵⁰	USA	CS, S	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Facebook	Time spent checking, reading, posting, looking at photos. Frequency topics relating to weight, body image, diet topics are posted and commented on. Frequency of weight and body comparisons with friends	Body Image: Body Shape Questionnaire (BSQ) Researcher Question: "How often has looking at someone else's photos on Facebook made you feel negatively about your body in the last month?" Food choices: Food choice Test (EAT-26)	20% time spent looking at photos: 8.51% posts on body, weight, diet, exercise. More time on Facebook related to feeling negatively after viewing photos. More time viewing/posting photos led to more attention to physical appearance of others and negative body attitudes.

(Continues)

TABLE 2 (Continued)

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Cohen et al ⁴⁸	AUS	CS, S	n (%F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Facebook Instagram	Frequency attention is given to dress, body in others pictures	Internalisation Subscale (SATAQ-3) Physical Appearance Comparison Scale (PACS) Appearance Evaluation Subscale (MBSRQ) Body Surveillance Subscale (OBSCS) Drive for Thinness Subscale (EDI)	Increased Facebook exposure and weight loss desire increased disordered food choice. 99.2% of participants had Facebook. 90.3% checked Facebook 3-5 times daily 81.5% had an Instagram account. 57.5% checked Instagram 3-5 times/day. Total time not associated with body image outcomes. Facebook appearance exposure positively correlated with thin-ideal internalisation, and body surveillance. On Instagram: Following health and fitness accounts positively correlated with thin-ideal internalisation and drive for thinness. Following celebrity accounts associated with thin-ideal internalisation and body surveillance. Users reported greater body surveillance than non-users.
Hayes et al ⁶⁸	USA	CS, S	n (%F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Facebook	Time spent and accessed/day Facebook apps used over last 30 days (eg, pictures, posting, commenting)	3 Body image questions adapted from Centre for Eating Disorders survey.	29.5% of young adults reported looking at own photos more than twice per week. Young adults scored higher on negative Facebook body image scale than members of older cohorts.

(Continues)

TABLE 2 (Continued)

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Hendrickse et al ⁵⁶	USA	CS, S	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Instagram	Instagram Photoactivity Index ^a Passive exposure Physical Appearance Comparison Scale (PACS) ^a	Body Dissatisfaction Subscale (EDI) Drive for Thinness Subscale (EDI)	Age independently inversely associated with higher body image dissatisfaction. Greater appearance comparisons associated with greater body dissatisfaction and drive for thinness. Appearance comparisons mediated Instagram photo activity with drive for thinness, and body dissatisfaction.
Strubel et al ⁶⁶	USA	CS	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Facebook	General Social Media Usage subscale from Media & Technology Usage and Attitudes Scale ^a	Internalisation Subscale (SATAQ-3) ^a Physical Appearance Comparison Scale (PACS) Body Parts Satisfaction Scale for Females (BPSS-F) Rosenberg Self-Esteem Scale (RSES)	No significant correlations between Facebook use and body image outcomes
Walker et al ⁶⁴	USA	CS, S	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity (%)	Facebook	Facebook Intensity Scale: Total number of friends Time spent on Facebook/day Physical appearance comparison scale (PACS) Online Fat Talk Scale	Eating Disorder Examination Questionnaire (EDEQ-Q4) Multidimensional Perfectionism Scale (MPS) Beck Depression Inventory State-Trait Anxiety Inventory General Self Efficacy Scale	Appearance comparison and online fat talk positively associated with disordered eating behaviors. Facebook intensity positively associated with appearance comparisons. Appearance comparison mediated the relationship between Facebook intensity and disordered eating. Online Fat Talk did not significantly mediate the relationship between

(Continues)

TABLE 2 (Continued)

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Baker et al ⁷²	USA	Qual, FG	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Instagram	Research question 1: How do female college students use Instagram and what features (eg, posting, liking and commenting) are most important?	Research question 2: Does Instagram use impact female college students body image and in what ways?	Research question 1: Uses and features; (i) effortful posting, (ii) promotion of self, (iii) seeking engagement Research question 2: Body image; (i) responding to beauty ideals, (ii) comparing self with others, (iii) display of self
Barry et al ⁴⁴	USA	Qual, I	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Social Media	In-depth Interviews	Explored cultural factors impacting body dissatisfaction. Participants were asked how dress and social media practices affect their body image.	Social media provides a platform for self-objectification, body surveillance and to receive immediate appearance assessments. Social media exposure provokes men to analyze their self-image and engage in comparison and competition among peers. Social media amplifies focus on visual self and critical analysis of clothing and bodies.
Grover et al ⁷¹	USA	Qual, FG	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Social Media	—	Open conversations exploring internalized thin-ideal values. Origins of the thin-ideal and understanding themes factors that	Students focus on image of themselves portrayed online. Social media images of peers affect young women's self-perceptions.

(Continues)

TABLE 2 (Continued)

References	Country	Design	Participant characteristics	Channel	Exposure measure	Outcome measure	Key findings
Vatralus et al ⁷³	USA	Qual, FG, I	n (% F) Setting Age (M ± SD) BMI (kg/m ²) Ethnicity	Social Media	Social media use and daily life	Explored the influences of social media on participants eating habits.	Participants felt some peers posts intend viewers to feel shame about their bodies. Viewing pictures of peers losing weight was a form of motivation and inspiration Social media increases food choices.
			34(79) College 20.4 years 26% OW/OB Caucasian (82.4)				The collective effect of thin-ideal images may take precedence over individual body image attitudes. promote being ultra-thin. Viewing pictures of food too frequently is irritating. Viewing food posts could lead to feeling hungry, eating more or restraint. Social media can distract during meal times and lead to poor food choices.

Abbreviations: BMI, body mass index; CS, cross-sectional; Qual, qualitative; S, survey; FG, Focus Groups, I, interview; SMO, social media observation; NR, not reported; RD, researcher developed, SNS, social networking site.

^aAdapted.

^bResearcher developed.

choice^{46,50,64,70} outcomes were explored in 31% of studies. Facebook^{46,48,50,64,66,68} and Instagram^{48,56,70} studies measured either neutral^{48,56,66,68} or negative engagement,^{46,50,64} and exposure to non-specific,^{50,56,64,68,71} idyllic images,^{46,48} or selfies.⁷⁰ Studies measured either both BI and food choice outcomes (n = 3),^{46,50,70} BI outcomes only (n = 3),^{48,56,68} or food choice outcomes only (n = 1).⁶⁴ Negative engagement, such as maladaptive use or reassurance seeking, was associated with higher disordered food choices,⁶⁴ and viewing non-specific images⁵⁰ was associated with higher body dissatisfaction among USA college cohorts. Exposure to idyllic images was associated with greater negative body talk,⁴⁶ drive for thinness,⁴⁸ or healthy eating.⁴⁶ Investment in receiving feedback on selfies posted was associated with greater drive for thinness.⁷⁰ Predisposition to engage in appearance comparisons mediated the relationships between intensity of Facebook use and disordered eating,⁶⁴ and between Instagram photo use and both body dissatisfaction and drive for thinness.⁵⁶ The community study found that young adults had higher negative BI scores as a result of Facebook exposure compared to older cohorts.⁶⁸

Qualitative studies were USA based, using a semi-structured interview,⁴⁴ focus group,^{72,73} or both approaches,⁷⁴ in mostly college cohorts.^{72,74} Theoretical approaches used by the research teams included grounded theory⁷² and phenomenology.⁷⁴ Study sample size ranged from 20 to 73 participants, with an age range of 19 to 29 years.^{44,74} Participants were mostly female (82%) and Caucasian (>60%).^{44,73,74} Studies explored SM effects on young men's dress practices and BI,⁴⁴ young women's self-image and thin ideals,⁷² and eating habits of young men and women.⁷⁴

Qualitative thematic analysis revealed five themes contributing to SM's influence on BI and food choices: (i) SM spurs comparison and competition, (ii) comparing on SM heightens feelings about the body, (iii) young adults self-evaluate and modify appearances to portray an ideal online image, (iv) young adults are aware of SM's impact on BI and food choices, however, (v) external validation via SM is pursued.

All qualitative studies (n = 4) identified that SM promoted a culture of personal appearance^{44,72-74} and food-related⁷⁴ comparison and competition among peers. Participants reflected on the feeling of being constantly compared to others as well as engaging in self-comparisons regularly.^{44,72-74} Images of selfies, body physiques, fashion, exercise and weight-loss were reported to be popular posts, and while some posts were considered inspirational, many posts were seen as showboating^{44,72,74} which were perceived as intending to make peers feel bad about themselves.

Exposure to body and food-related posts heightened feelings of self-judgement and body dissatisfaction because

participants compared peers physical and lifestyle attributes to their own perceived strengths and inadequacies and often felt that they did not measure up to these online ideals.^{44,72-74} Online appearances were considered important with participants using photo editing filters,^{44,72,73} and fashion choices,⁴⁴ and promotion of their physique⁴⁴ and fitness achievements⁷⁴ to accomplish this. Selfies were usually taken from multiple angles⁴⁴ with only the best images or those detailing significant accomplishments posted.⁷⁴ Young adults reported using SM as a platform for body and food-related feedback and overanalysed images for quality and the number of follows and likes they received.^{44,73} This indicates that participants objectified themselves online to obtain an observers viewpoint about their bodies.³² Food-related images assisted with meal preparation ideas.⁷⁴ However, exposure to these images also increased young adults food preoccupations. Food-related posts amplified feelings of hunger, with participants reporting wanting to eat regardless of satiety cues. In some situations, participants reported they felt a need to implement dietary restraint when exposed to food images considered "unhealthy". Engaging in social media during mealtimes was reported to distract young adults and predisposed them to make poorer food choices. However, participants appear aware of the negative impact SM can have on their BI and food choices and yet continued to engage on these platforms.^{44,72-74}

4 | DISCUSSION

This mixed methods systematic review aimed to understand how SM engagement and exposure to image-related content influences BI and food choice in healthy young adults. Quantitative analysis (n = 26) identified that SM engagement or exposure to image-related content was associated with higher body dissatisfaction, dieting/restricting food or overeating, or healthy food choices. Although the research has been dominated by quantitative studies, the qualitative research shed further light on the influence of SM on young adults in relation to feelings of comparison, competition and their pursuit of external validation. Considered together, findings suggest both SM engagement and exposure to image-related content were associated with higher negative body image and some unhealthy food choices, however, these relationships are complex. Young adults engaging in negative SM activities (negative body talk, seeking reassurance, engaging in appearance-related comparisons or self-objectification), or being exposed to idyllic images (celebrities, peers, fitness) may be more susceptible to negative BI and food choice outcomes.

The findings from this review of observational literature are consistent with experimental studies exploring image-related content. For example, young adult women exposed to

idyllic images of celebrities, peers and fitness (“fitspiration”) on Instagram reported greater body dissatisfaction,^{36,75} and weight loss behaviours when exposed to “fitspiration” on Pinterest.³⁰ *Fitspiration* images aim to inspire healthy eating and exercise behaviours.³⁶ However, content analyses of fitspiration on SM platforms have found that many images and their messages praise thinness and high fitness levels as ideals.^{76,77} The internalisation of thin and fitness ideals have been established as factors that increase body dissatisfaction in women^{36,78} suggesting that when the focus is on attaining physical body ideals, there is a potential for negative BI.⁴⁶ SM exposure to idyllic content may be more pronounced compared to mass media due to the pervasive and personalised nature of these platforms.⁵²

Studies in this review identified that a predisposition to engage in appearance-related comparisons online mediated the relationship between SM engagement and exposure to image-related content and BI,^{44,51-53,55,56,69,72,74} and food choice outcomes.^{52,64} Social comparison theory suggests that people are inclined to compare themselves to others as a means of self-evaluation and this predisposition to compare is stronger when the comparator is considered similar to oneself.⁷⁹ These findings highlight that by facilitating connection and engagement with peers and close or distant networks, SM platforms present an opportune vehicle for appearance-related comparisons.¹⁸ Qualitative findings in this review highlight that young adults appear pressured to present an ideal image of themselves online.^{44,72-74} This can lead to young adults vetting and altering photos, in order to post and share optimised images of themselves and their lives, thus further perpetuating an online environment of competition and comparison among peers.^{44,63,72,74} The extent that young adults engage in appearance comparisons will depend on how they internalise these ideals.⁸⁰ When there is a strong desire to conform to societal ideals combined with a discrepancy in one's self-evaluation,⁷⁹ there is a higher risk of developing body dissatisfaction or engaging in unhealthy eating behaviours.⁸⁰ Supporting this contention, in this review, appearance comparisons made with peers were found to “amplify” effects on dieting,⁵² and body dissatisfaction⁵³ in young adult women.

SM remains a challenging platform for health professionals to engage and educate young adults about healthy behaviours.¹⁴ Young adults seem drawn to the health messages of influencers and celebrities in preference to health professionals.⁸⁰ Many of these SM accounts have large fan bases for which they endorse products, praise idyllic lifestyles and share their perception of health and BI messages often misaligned with health promotion messages. They also provide a compelling source of entertainment and examples of the lived experience that young adults can aspire to. Health professionals have strived to emulate these

qualities using social marketing strategies reported to improve engagement. These include using striking images and video, celebrity and peer spokespeople, and encouraging user-generated content and collaboration.^{10,81} However, this systematic review indicates these exposures, or merely engaging on SM platforms may negate the original intent of health messages if not considered and moderated carefully.

There is a risk of health professionals unintentionally perpetuating poor BI and disordered food choices in healthy young adults while trying to implement engaging SM health-related behaviour change campaigns. A re-examination of core message philosophies, sensitivities towards BI dissatisfaction and disordered food choices to understand these nuances is needed to ensure SM interventions both engage young adults while mitigating the risks posed to body dissatisfaction and abnormal eating behaviours. Findings from this review suggest that SM health messages refrain from focusing on weight or physicality as measures of health. Alternatively, SM health messages that may support body satisfaction include: celebrating body functionality as opposed to body aesthetics,⁸² promoting greater self-compassion with positive quotes and illustrations online,⁸³ and representing body diversity by celebrating a variety of body shapes, sizes, ethnicities and gender identities online.⁸⁴

These findings must be considered in light of the following limitations; this review evaluated habitual SM exposure using only observational literature. Therefore, causation and longer-term eating behaviours cannot be determined. However, there are some insights that health professionals can consider in future SM health communications to mitigate risks associated with promoting negative BI and undesirable eating behaviours. Caution should be exercised when interpreting these results which had a focus on university cohorts from industrialised nations.

It is recommended future research explores the effects of exposures in broader young adult population groups and community settings. The SM environment is rapidly evolving making timely and relevant recommendations an ongoing challenge. Heterogeneity of tools used to evaluate outcome measures meant narrative synthesis was used to interpret results with qualitative analyses used to contextualise findings. In practice, health professionals need to consider discussing the influence of SM on BI with their young adult clients, including when engaging in health promotion campaigns.

In conclusion, SM is considered an essential platform for health professionals to reach and engage with young adults to encourage healthy behaviours. This review indicates that SM engagement and exposure to image-related content may have a negative impact on BI and food choice in healthy young adult population groups who are vulnerable to SM influence. Viewing idyllic images of celebrities, peers, food, fitness and

fashion, engaging in negative behaviours (body fat talk, reassurance seeking), or appearance comparisons online are specific exposures that may increase these risks. The pressure young adults feel to present an ideal image of themselves provided additional insight with significant investment given to photo taking and editing, fashion and promoting physical and fitness achievements on SM identified. SM campaigns must be cognisant of image-related content to not unintentionally create or promote further body dissatisfaction among young adults.









AUTHOR CONTRIBUTIONS

K.R. and T.M.C. conceptualised the review. K.R. completed literature searches. K.R., A.M., M.B., S.S. screened references. K.R., T.M.C., S.G., M.B. extracted data and completed quality assessment. K.R. and T.M.C. analysed and interpreted the data. L.B. and H.T. contributed to the final paper and the conceptualisation of the research questions. S.M. contributed to the final paper. All authors have read and approved the final version submitted for publication. We wish to acknowledge the contribution of Associate Professor Catherine Lombard (dec) for the planning and conceptualisation of this review. We would like to acknowledge Dr Karen Klassen and Shistata Shrestha for their assistance. This work is an essential adjunct to the Communicating Health project funded by the National Health and Medical Research Council (NHMRC) (grant number: GNT1115496). Communicating Health brings together academics from social marketing, consumer psychology, and nutrition to create best practice guidelines for nutrition professions to help them communicate with young adults. K.R. is a self-funded PhD Candidate. H.T., T.M.C. and L.B. are co-investigators on Communicating Health. A.M. and M.B. salaries are funded by Communicating Health (NHMRC grant number: GNT1115496). S.M. holds an ongoing salaried position at Victoria University.

CONFLICT OF INTEREST

Authors have no conflicts of interest to declare for this review.

ORCID

Kim Rounsefell  <https://orcid.org/0000-0001-8784-9004>
 Simone Gibson  <https://orcid.org/0000-0002-0008-9020>
 Siân McLean  <https://orcid.org/0000-0002-4273-2037>
 Merran Blair  <https://orcid.org/0000-0001-9804-1633>
 Annika Molenaar  <https://orcid.org/0000-0001-6037-4133>
 Linda Brennan  <https://orcid.org/0000-0002-1964-1487>
 Helen Truby  <https://orcid.org/0000-0002-1992-1649>
 Tracy A. McCaffrey  <https://orcid.org/0000-0001-9699-3083>

REFERENCES

- Arnett J. Emerging adulthood: what is it, and what is it good for? *Child Dev Perspect.* 2007;1:68-73.
- Wood D, Crapnell T, Lau L, et al. Emerging adulthood as a critical stage in the life course. In: Halfon N, Forrest C, Lerner R, Faustman E, eds. *Handbook of Life Course Health Development.* Cham, Switzerland: Springer, 2018:123-143.
- Australian Bureau of Statistics. Consumption of sweetened beverages. Updated 2015. <http://www.abs.gov.au/ausstats/abs@.nsf/lookup/4364.0.55.007main+features7102011-12>. Accessed January 7, 2019.
- Nour M, Sui Z, Grech A, Rangan A. The fruit and vegetable intake of young Australian adults: a population perspective. *Public Health Nutr.* 2017;20:2499-2512.
- National Health Service Digital. Fruit and vegetables. Updated 2017. <http://healthsurvey.hscic.gov.uk/data-visualisation/data-visualisation/explore-the-trends/fruit-vegetables.aspx>. Accessed July 10, 2019.
- Bleich SN, Vercammen KA, Koma JW, Li Z. Trends in beverage consumption among children and adults, 2003-2014. *Obesity.* 2018;26:432-441.
- Fryar CD, Hughes JP, Herrick KA, Ahluwalia N. *Fast Food Consumption Among Adults in the United States, 2013-2016.* Hyattsville, MD: National Center for Health Statistics Data Brief; 2018:1-9.
- Gakidou E, Afshin A, Abajobir AA, et al. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet.* 2017;390:1345-1422.
- Perrin A. Social media usage: 2005-2015. Updated 2015. <http://www.pewinternet.org/2015/10/08/social-networking-usage-2005-2015/>. Accessed May 1, 2017.
- Kite J, Foley BC, Grunseit AC, Freeman B. Please like me: Facebook and public health communication. *PLoS One.* 2016;11:1-16.
- Capurro D, Cole K, Echavarría MI, Joe J, Neogi T, Turner AM. The use of social networking sites for public health practice and research: a systematic review. *J Med Internet Res.* 2014;16:E79.
- Klassen KM, Douglass CH, Brennan L, Truby H, Lim MSC. Social media use for nutrition outcomes in young adults: a mixed-methods systematic review. *Int J Behav Nutr Phys Act.* 2018;15:70.
- Thackeray R, Neiger BL, Hanson CL, McKenzie JF. Enhancing promotional strategies within social marketing programs: use of web 2.0 social media. *Health Promot Pract.* 2008;9:338-343.
- Waters RD, Burnett E, Lamm A, Lucas J. Engaging stakeholders through social networking: how nonprofit organizations are using Facebook. *Public Relat Rev.* 2009;35:102-106.
- Maher CA, Lewis LK, Ferrar K, Marshall S, Bourdeaudhuij DI, Vandelanotte C. Are health behavior change interventions that use online social networks effective? A systematic review. *J Med Internet Res.* 2014;16:E40.
- Freeman B, Kelly B, Vandevijvere S. Young adults: beloved by food and drink marketers and forgotten by public health? *Health Prom Int.* 2015;31:954-961.
- Mangold WG, Faulds DJ. Social media: the new hybrid element of the promotion mix. *Bus Horiz.* 2009;52:357-365.

18. Perloff RM. Social media effects on young women's body image concerns: theoretical perspectives and an agenda for research. *Sex Roles*. 2014;71:363-377.
19. Fardouly J, Vartanian LR. Social media and body image concerns: current research and future directions. *Curr Opin Psychol*. 2016;9:1-5.
20. Grogan S. Body image and health: contemporary perspectives. *J Health Psychol*. 2006;11:523-530.
21. Bucchianeri M, Neumark-Sztainer D. Body dissatisfaction: an overlooked public health concern. *J Public Ment Health*. 2014;13:64-69.
22. Paxton SJ, Neumark-Sztainer D, Hannan PJ, Eisenberg ME. Body dissatisfaction prospectively predicts depressive mood and low self-esteem in adolescent girls and boys. *J Clin Child Adolesc Psychol*. 2006;35:539-549.
23. National Eating Disorders Collaboration. What is body image? <https://www.nedc.com.au/assets/Fact-Sheets/NEDC-Fact-Sheet-Body-Image.pdf>. Accessed 8 January 2019.
24. Wynne C, Comiskey C, McGilloway S. The role of body mass index, weight change desires and depressive symptoms in the health-related quality of life of children living in urban disadvantage: testing mediation models. *Psychol Health*. 2016;31:147-165.
25. Neumark-Sztainer D, Paxton SJ, Hannan PJ, Haines J, Story M. Does body satisfaction matter? Five-year longitudinal associations between body satisfaction and health behaviors in adolescent females and males. *J Adolesc Health*. 2006;39:244-251.
26. The National Eating Disorders Collaboration. Eating disorders prevention, treatment & management: An updated evidence review. Updated 2017. <https://www.nedc.com.au/assets/NEDC-Publications/Evidence-Reviewelectronic-complete-FINAL-compressed.pdf>. Accessed January 8, 2019.
27. Australian Bureau of Statistics. 8146.0—Household use of information technology, Australia, 2016–17. Updated 2018. <http://www.abs.gov.au/ausstats/abs@.nsf/mf/8146.0>. Accessed January 8, 2019.
28. Sensis. Sensis social media report. *Chapter 1 - Australians and Social Media*. Melbourne, Australia: Sensis; 2017.
29. Arroyo A, Harwood J. Exploring the causes and consequences of engaging in fat talk. *J Appl Commun Res*. 2012;40:167-187.
30. Lewallen J, Behm-Morawitz E. Pinterest or thinterest?: social comparison and body image on social media. *Soc Media Soc*. 2016;2:1-9.
31. Rodgers RF. The relationship between body image concerns, eating disorders and internet use, part II: an integrated theoretical model. *Adolesc Res Rev*. 2016;1:121-137.
32. Fredrickson BL, Roberts TA. Objectification theory. *Psychol Women Q*. 1997;21:173-206.
33. Morry M, Staska S. Magazine exposure: internalization, self-objectification, eating attitudes, and body satisfaction in male and female university students. *Can J Behav Sci*. 2001;33:269-279.
34. Daniel S, Bridges SK. The drive for muscularity in men: media influences and objectification theory. *Body Image*. 2010;7:32-38.
35. Ben B, Martin D. Dapper dudes: Young men's fashion consumption and expressions of masculinity. *Critl Stud Men Fashion*. 2015;2:5-21.
36. Tiggemann M, Zaccardo M. "Exercise to be fit, not skinny": the effect of fitspiration imagery on women's body image. *Body Image*. 2015;15:61-67.
37. Dejmancee T. "Food porn" as postfeminist play: digital femininity and the female body on food blogs. *Tel New Media*. 2016;17:429-448.
38. Calogero RM. Objectification theory, self-objectification, and body image. *Encyclopedia of Body Image and Human Appearance*. Academic Press: San Diego; 2012:574-580.
39. Holland G, Tiggemann M. A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image*. 2016;17:100-110.
40. Lombard C, Brennan L, Reid M, et al. Communicating health—Optimising young adults' engagement with health messages using social media: study protocol. *Nutr Diet*. 2018;75:509-519.
41. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med*. 2009;151(4):264-269.
42. National Center for Biotechnology Information. Appendix D: Quality Assessment Forms. Updated 2004. <https://www.ncbi.nlm.nih.gov/books/NBK35156/>. Accessed April 4, 2017.
43. Spencer L, Ritchie J, Lewis J, Dillon L. Quality in qualitative evaluation: a framework for assessing research evidence. Updated 2003. https://www.heacademy.ac.uk/system/files/166_policy_hub_a_quality_framework.pdf. Accessed April 7, 2017.
44. Barry B, Martin D. Fashionably fit: Young Men's dress decisions and appearance anxieties. *Textile*. 2016;14:326-347.
45. Ahadzadeh AS, Sharif SP, Ong FS. Self-schema and self-discrepancy mediate the influence of Instagram usage on body image satisfaction among youth. *Comput Human Behav*. 2017;68(8-16):8-16.
46. Arroyo A, Brunner SR. Negative body talk as an outcome of friends' fitness posts on social networking sites: body surveillance and social comparison as potential moderators. *Appl Commun Res*. 2016;44:216-235.
47. Barry CT, Reiter SR, Anderson AC, Schoessler ML, Sidoti CL. "Let me take another selfie": Further examination of the relation between narcissism, self-perception, and Instagram posts. *Psychol Pop Media Cult*. 2017;6(1):48-60.
48. Cohen R, Newton-John T, Slater A. The relationship between Facebook and Instagram appearance-focused activities and body image concerns in young women. *Body Image*. 2017;23:183-187.
49. Cohen R, Newton-John T, Slater A. 'Selfie'-objectification: the role of selfies in self-objectification and disordered eating in young women. *Comput Human Behav*. 2018;70:68-74.
50. Eckler P, Kalyango Y, Paasch E. Facebook use and negative body image among US college women. *Women Health*. 2017;57:249-267.
51. Fardouly J, Willburger B, Vartanian LR. Instagram use and young women's body image concerns and self-objectification: testing mediational pathways. *New Media Soc*. 2018;20:1380-1395.
52. Fardouly J, Pinkus RT, Vartanian LR. The impact of appearance comparisons made through social media, traditional media, and in person in women's everyday lives. *Body Image*. 2017;20:31-39.
53. Fardouly J, Vartanian LR. Negative comparisons about one's appearance mediate the relationship between Facebook usage and body image concerns. *Body Image*. 2015;12:82-88.
54. Feltman CE, Szymanski DM. Instagram use and self-objectification: the roles of internalization, comparison, appearance commentary, and feminism. *Sex Roles*. 2018;78:311-324.

55. Hanna E, Ward LM, Seabrook RC, et al. Contributions of social comparison and self-objectification in mediating associations between facebook use and emergent adults' psychological well-being. *Cyberpsychol Behav Soc Netw*. 2017;20:172-179.
56. Hendrickse J, Arpan LM, Clayton RB, Ridgway JL. Instagram and college women's body image: investigating the roles of appearance-related comparisons and intrasexual competition. *Comput Human Behav*. 2017;74:92-100.
57. Howard LM, Heron KE, MacIntyre RI, Myers TA, Everhart RS. Is use of social networking sites associated with young women's body dissatisfaction and disordered eating? A look at black-white racial differences. *Body Image*. 2017;23:109-113.
58. Hummel AC, Smith AR. Ask and you shall receive: desire and receipt of feedback via Facebook predicts disordered eating concerns. *Int J Eat Disord*. 2015;48:436-442.
59. Kim JW, Chock TM. Body image 2.0: associations between social grooming on Facebook and body image concerns. *Comput Human Behav*. 2015;48:331-339.
60. Lee H-R, Lee H, Choi J, Kim J, Han H. Social media use, body image, and psychological well-being: a cross-cultural comparison of Korea and the United States. *J Health Commun*. 2014;19:1343-1358.
61. Manago AM, Ward LM, Lemm KM, Reed L, Seabrook R. Facebook involvement, objectified body consciousness, body shame, and sexual assertiveness in college women and men. *Sex Roles*. 2015;72:1-14.
62. Smith AR, Hames JL, Joiner TE. Status update: maladaptive Facebook usage predicts increases in body dissatisfaction and bulimic symptoms. *J Affect Disord*. 2013;149:235-240.
63. Wagner C, Aguirre E, Sumner EM. The relationship between Instagram selfies and body image in young adult women. *First Monday*. 2016;21(9). <https://doi.org/10.5210/fm.v21i9.6390>
64. Walker M, Thornton L, De Choudhury M, et al. Facebook use and disordered eating in college-aged women. *J Adolesc Health*. 2015; 57:157-163.
65. Niu G, Sun L, Liu Q, Chai H, Sun X, Zhou Z. Selfie-posting and young adult women's restrained eating: the role of commentary on appearance and self-objectification. *Sex Roles*. 2019;80(2):1-7.
66. Strubel J, Petrie TA, Pookulangara S. "Like" me: shopping, self-display, body image, and social networking sites. *Psychol Pop Media Cult*. 2018;7:328-344.
67. Veldhuis J, Alleve JM, Bij de Vaate AJD, Keijer M, Konijn EA. Me, my selfie, and I: the relations between selfie behaviors, body image, self-objectification, and self-esteem in young women. *Psychol Pop Media Cult*. 2018;1-17. <https://doi.org/10.1037/ppm0000206>
68. Hayes M, van Stolk-Cooke K, Muench F. Understanding Facebook use and the psychological affects of use across generations. *Comput Human Behav*. 2015;49:507-511.
69. Xiaojing A. Social networking site uses, internalization, body surveillance, social comparison and body dissatisfaction of males and females in mainland China. *Asian J Commun*. 2017;27:616-630.
70. Butkowski CP, Dixon TL, Weeks K. Body surveillance on Instagram: examining the role of selfie feedback investment in young adult women's body image concerns. *Sex Roles*. 2019;81:385-397.
71. Grover A, Grover A, Foreman J, Foreman J, Burckes-Miller M, Burckes-Miller M. "Infecting" those we care about: social network effects on body image. *Int J Pharm Healthc Mark*. 2016;10:323-338.
72. Baker N, Ferszt G, Breines JG. A qualitative study exploring female college students' Instagram use and body image. *Cyberpsychol Behav Soc Netw*. 2019;22:277-282.
73. Vaterlaus JM, Patten EV, Roche C, Young JA. Gettinghealthy: the perceived influence of social media on young adult health behaviors. *Comput Human Behav*. 2015;45:151-157.
74. Brown Z, Tiggemann M. Attractive celebrity and peer images on Instagram: effect on women's mood and body image. *Body Image*. 2016;19:37-43.
75. Simpson CC, Mazzeo SE. Skinny is not enough: a content analysis of fitspiration on Pinterest. *Health Commun*. 2017;32:560-567.
76. Carrotte ER, Prichard I, Lim MSC. "Fitspiration" on social media: a content analysis of gendered images. *J Med Internet Res*. 2017; 19(3):e95.
77. Harper B, Tiggemann M. The effect of thin ideal media images on women's self-objectification, mood, and body image. *Sex Roles*. 2008;58:649-657.
78. Festinger L. A theory of social comparison processes. *Hum Relat*. 1954;7:117-140.
79. Myers TA, Crowther JH. Social comparison as a predictor of body dissatisfaction: a meta-analytic review. *J Abnorm Psychol*. 2009; 118:683-698.
80. Hoffman SJ, Tan C. Following celebrities' medical advice: meta-narrative analysis. *BMJ*. 2013;347:F7 151.
81. Royne LM. Marketing for public health: we need an app for that. *J Consumer Aff*. 2011;45:1-6.
82. Wood-Barcalow NL, Tylka TL, Augustus-Horvath CL. "But I like my body": positive body image characteristics and a holistic model for young-adult women. *Body Image*. 2010;7:106-116.
83. Slater A, Varsani N, Diedrichs PC. #fitspo or #loveyourself? The impact of fitspiration and self-compassion Instagram images on women's body image, self-compassion, and mood. *Body Image*. 2017;22:87-96.
84. Slater A, Cole N, Fardouly J. The effect of exposure to parodies of thin-ideal images on young women's body image and mood. *Body Image*. 2019;29:82-89.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

How to cite this article: Rounsefell K, Gibson S, McLean S, et al. Social media, body image and food choices in healthy young adults: A mixed methods systematic review. *Nutrition & Dietetics*. 2020;77: 19–40. <https://doi.org/10.1111/1747-0080.12581>