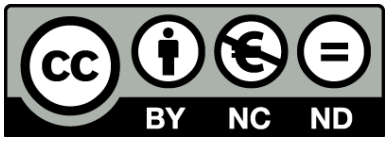
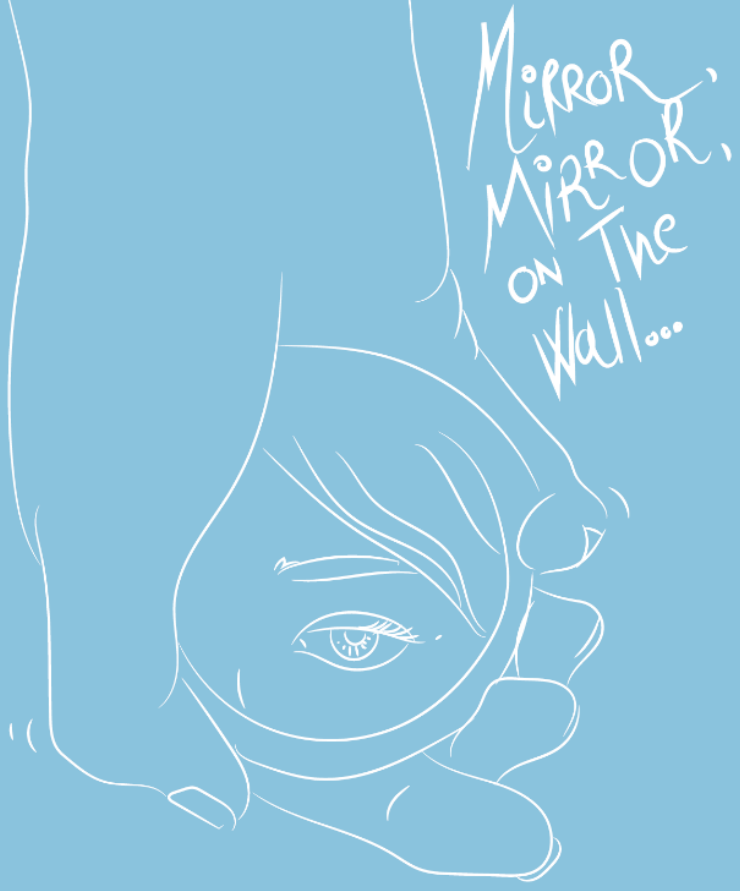
UNIVERSITAT DE BARCELONA

Social network sites use, body image disturbance and other psychological correlates during the COVID-19 pandemic

Helena Vall Roqué





PhD Thesis by
Helena Vall Roqué

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Thesis presented by

Helena Vall Roqué

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Supervised by

Dr. Carmina Saldaña

Dr. Ana Andrés

Clinical and Health Psychology Doctoral Program

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Author: Helena Vall Roqué

Director: Dr. Carmina Saldaña

Co-director: Dr. Ana Andrés

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CONTENTS

Preface

This thesis started before the COVID-19 pandemic hit the world. We started by developing and validating a Spanish version of the Physical Appearance Comparisons Scale-Revised (PACS-R) [Study 1], and by collecting data about SNSs use and body image-related variables. Two months after this data collection, the outbreak of the COVID-19 pandemic was the headline in all newspapers in the world. It did not take long until researchers started to claim that the pandemic and its associated lockdown were probably having a deep impact on SNSs use and mental health, and that it could lead to an increase in eating disorders and body image disturbance.

It seemed clear that we could not ignore the turbulent and historical times that we were living. Hence, only a few months after the pandemic outbreak, we decided to collect data again in order to examine emotional distress, disordered eating, SNSs use, body image disturbances and self-esteem [Studies 2 and 3].

Moreover, considering that several participants who completed the questionnaires in our first data collection had provided their emails to be contacted again if necessary, we decided that it would be relevant to contact them again and explore their trajectories throughout the pandemic. This allowed us to conduct a longitudinal study about the changes in Instagram use, body dissatisfaction and physical appearance comparisons throughout the COVID-19 pandemic, using the 'baseline' data that we had obtained before the pandemic outbreak [Study 4].

This thesis is presented for the Degree of Doctor by the University of Barcelona (International Doctor mention). Even though the thesis was carried out at the University of Barcelona, it was complemented by two research stays: at the University of Oslo (Norway) and at the University of Melbourne (Australia). The thesis follows the published papers format and includes four studies, which have been published in international peer-reviewed scientific journals. First, an introduction section is given, which provides an overview of the topics that

this thesis addresses. Then, the aims of the thesis are described, and the four studies are presented as individual chapters. Finally, a discussion is developed, and the main conclusions of the thesis are summarised.

Glossary of abbreviations

ACT	Acceptance and Commitment Therapy
BCS	Body Comparison Scale
BEECOM	Body, Eating, and Exercise Comparison Orientation Measure
BMI	Body Mass Index
CBT	Cognitive Behavioural Therapy
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
COVID-19	Coronavirus Disease 2019
DACS	Downward Appearance Comparison Scale
DASS-21	Depression, Anxiety and Stress Scales-21
DSM-5	Diagnostic and Statistical Manual of Mental Disorders-5
EAT-26	Eating Attitudes Test-26
ED	Eating Disorder
EDI-3	Eating Disorders Inventory-3
EFA	Exploratory Factor Analysis
GFI	Goodness-of-Fit Index
ICC	Intraclass Correlation Coefficient
INCOM	Iowa-Netherlands Comparison Orientation Measure
JCR	Journal of Citation Reports
KMO	Kaiser-Meyer-Olkin
LGBTQ+	Lesbian, Gay, Bisexual, Transgender, Queer and/or Questioning, and more
MBSRQ	Multidimensional Body-Self Relations Questionnaire
MW	Minimum Wage
NFI	Normed Fit Index
PACS	Physical Appearance Comparison Scale
PACS-R	Physical Appearance Comparison Scale-Revised
PACS-3	Physical Appearance Comparison Scale-3
RMSEA	Root Mean Square Error of Approximation
RSES	Rosenberg Self-Esteem Scale
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2

SATAQ-4	Sociocultural Attitudes Towards Appearance Questionnaire-4
SD	Standard Deviation
SEM	Structural Equation Modelling
SNS	Social Network Site
SPA	Self-assessed Physical Attractiveness
SRMR	Standardised Root Mean Square Residual
ULS	Unweighted Least Square
UPCS	Upward Physical Appearance Comparison Scale
USA	United States of America
VIF	Variance Inflation Factor
WHO	World Health Organization

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SUMMARY

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Summary

The COVID-19 pandemic has caused a global health crisis, and there has been considerable concern about its impact on mental health. Several authors have highlighted the potential negative impact of the pandemic and its associated lockdown on body image disturbance. Also, it has been suggested that the pandemic might have been linked with increased use of social network sites (SNSs), and it is known that (appearance-focused) SNSs use is a significant predictor of body image disturbance. Physical appearance comparison, in turn, is a key process that mediates the relationship between SNSs use and body image disturbance. However, research in this area is still limited, and very few studies have examined body image disturbance, appearance comparisons or SNSs use during the COVID-19 pandemic. Moreover, longitudinal studies with pre-pandemic data are scarce.

The aims of this thesis were: (1) to validate the Physical Appearance Comparison Scale-Revised (PACS-R) in a Spanish sample, (2) to examine the levels of depression, anxiety, stress, self-esteem, disordered eating, body dissatisfaction and drive for thinness during the first months of the pandemic, (3) to explore the changes in SNSs use, body dissatisfaction and appearance comparisons during the pandemic, (4) to determine whether Instagram use (frequency of use and appearance-focused use) was associated with body image disturbance and low self-esteem during the initial months of the pandemic, and (5) to explore whether there was a relationship between the changes in Instagram use throughout the pandemic and body dissatisfaction and appearance comparisons. A cross-cutting aim was to focus on young age groups and women, as these have been two of the most vulnerable collectives to the effects of the pandemic, and both body dissatisfaction and appearance-focused use of SNSs are especially prevalent in young people and women.

Four studies were conducted. The first three studies had a cross-sectional design and the fourth one a longitudinal design. The first study, which aimed to validate the Spanish PACS-R, involved 1405 participants aged 14-64, who completed the PACS-R along with measures of body image, eating disturbances, appearance-related sociocultural influences, self-esteem, and social comparison. The second and third studies were conducted during the

initial months of the pandemic and their objectives were to examine the levels of emotional distress and disordered eating (Study 2), to assess SNSs use, body image disturbance and self-esteem, and to explore whether SNSs use was associated with body image disturbance and low self-esteem (Study 3). A total of 2847 individuals aged 14-35 participated in the second study, and 2601 women aged 14-35 participated in Study 3. The fourth study aimed to determine the evolution of Instagram use, body dissatisfaction and appearance comparisons throughout the pandemic, and involved 272 Spanish women (16-70 years old) that were followed-up across four waves of assessment between November 2019 and July 2021.

The main findings of the thesis were the following ones: (1) the Spanish PACS-R has excellent psychometric properties, and it can be a useful tool to measure appearance comparisons among Spanish-speaking populations; (2) severe levels of depression, anxiety and stress were found in around one quarter of the sample during the initial months of the pandemic; (3) lockdown was associated with several perceived changes in different life domains; (4) following appearance-focused accounts on Instagram and a higher frequency of use of Instagram significantly predicted higher levels of drive for thinness during the initial months of the pandemic; (5) the frequency of use of SNSs and the number of women following appearance-focused accounts on Instagram might have increased with the pandemic, despite finding contradictory results; (6) body dissatisfaction and appearance comparisons significantly increased throughout the pandemic, even though these increases were not found to be significant for those with previous eating disorder risk; (7) no significant differences were found in body dissatisfaction and appearance comparisons depending on whether participants' frequency of Instagram use had changed or remained the same, or whether they had started, stopped or continued following appearance-focused accounts on Instagram during the pandemic.

These findings suggest that COVID-19 and its associated lockdown have had an impact on individuals' body image and on other psychological variables. The experiences of individuals with eating disturbances throughout the pandemic, and the relationship between the pandemic and SNSs use, might be complex and need further research.

Resum

La pandèmia de la COVID-19 ha provocat una crisi sanitària global, amb una conseqüent preocupació pel seu impacte en la salut mental de la població. Diversos/es autors/es també han destacat el potencial impacte negatiu d'aquesta pandèmia i del confinament pel que fa a les alteracions de la imatge corporal. A més, s'ha hipotetitzat sobre una possible relació entre la pandèmia i l'augment de l'ús de les xarxes socials, sabent que aquest (especialment un ús centrat en l'aparença) és un predictor significatiu de les alteracions de la imatge corporal. Així mateix, la comparació de l'aparença física és un dels processos clau que actua com a variable mediadora en la relació entre l'ús de xarxes socials i les alteracions de la imatge corporal. Tanmateix, la investigació en aquesta àrea encara és limitada i molt pocs estudis han examinat les alteracions de la imatge corporal, les comparacions de l'aparença física o l'ús de xarxes socials durant la pandèmia de la COVID-19. A més, els estudis longitudinals amb dades prèvies a la pandèmia són escassos.

Els principals objectius d'aquesta tesi van ser els següents: (1) validar l'escala de comparació de l'aparença física *Physical Appearance Comparison Scale-Revised* (PACS-R) en una mostra espanyola, (2) examinar els nivells de depressió, ansietat, estrès, autoestima, alteracions de la conducta alimentària, insatisfacció corporal i impuls per estar prim/a durant els primers mesos de la pandèmia, (3) explorar els canvis en l'ús de xarxes socials (especialment a Instagram), en la insatisfacció corporal i en les comparacions de l'aparença física durant la pandèmia, (4) determinar si l'ús d'Instagram (freqüència d'ús i ús centrat en l'aparença) estava associat amb alteracions de la imatge corporal i baixa autoestima durant els primers mesos de la pandèmia, i (5) explorar si hi havia una relació entre els canvis en l'ús d'Instagram al llarg de la pandèmia i la insatisfacció corporal i la tendència a la comparació de l'aparença física. Un objectiu transversal de la tesi va ser centrar-nos en persones joves i en dones, ja que aquests han estat dos dels col·lectius més vulnerables als efectes de la pandèmia, i tant la insatisfacció corporal com l'ús de les xarxes socials centrat en l'aparença física predominen en major grau entre els col·lectius joves i en dones que en altres grups de població.

S’han dut a terme quatre estudis. Els tres primers tenien un disseny transversal i el quart un disseny longitudinal. El primer estudi, que tenia com a objectiu crear i validar la versió espanyola de la PACS-R, va incloure una mostra de 1.405 persones d'entre 14 i 64 anys, que van completar la PACS-R i altres qüestionaris d'imatge corporal, alteracions alimentàries, influències socioculturals relacionades amb l'aparença, autoestima i comparació social. El segon i el tercer estudi es van dur a terme durant els mesos inicials de la pandèmia i els seus objectius van ser examinar els nivells de malestar emocional i alteracions alimentàries (estudi 2), indagar en l'ús de xarxes socials, les alteracions de la imatge corporal i l'autoestima, i explorar l’associació entre l'ús de xarxes socials i les alteracions de la imatge corporal i l’autoestima (estudi 3). Un total de 2.847 persones d'entre 14 i 35 anys van participar en el segon estudi, i 2.601 dones d'entre 14 i 35 anys van participar en el tercer. El quart estudi tenia com a objectiu determinar l'evolució de l'ús d'Instagram, la insatisfacció corporal i les comparacions de l’aparença física al llarg de la pandèmia, i va comptar amb una mostra de 272 dones espanyoles (16-70 anys) a les quals se les va avaluar en quatre moments temporals entre novembre de 2019 (abans de l'inici de la pandèmia) i juliol de 2021.

Les principals troballes de la tesi van ser les següents: (1) la versió espanyola de la PACS-R té excel·lents propietats psicomètriques, i pot ser una eina útil per mesurar les comparacions de l’aparença física en poblacions hispanoparlants; (2) es van trobar nivells greus de depressió, ansietat i estrès en aproximadament una quarta part de la mostra durant els primers mesos de la pandèmia; (3) el confinament es va associar a diversos canvis percebuts en diferents àrees vitals; (4) el seguiment de comptes centrats en l'aparença a Instagram i l’elevada freqüència d'ús d'Instagram van predir de manera significativa nivells elevats d'impuls per estar prim/a durant els primers mesos de la pandèmia; (5) la freqüència d'ús de les xarxes socials, així com el nombre de dones que segueixen comptes centrats en l'aparença a Instagram, podrien haver augmentat amb la pandèmia, tot i que es van trobar resultats contradictoris; (6) la insatisfacció corporal i les comparacions de l’aparença física van augmentar significativament al llarg de la pandèmia, tot i que no es va trobar que aquests augments fossin significatius per a aquelles persones amb risc previ de trastorn de la conducta alimentària; (7) no es van trobar

diferències significatives en la insatisfacció corporal i en les comparacions de l'aparença física en funció dels canvis en la freqüència d'ús d'Instagram o en el seguiment de comptes centrats en l'aparença al llarg de la pandèmia.

Els resultats suggereixen que la COVID-19 i el conseqüent confinament han tingut un impacte en la imatge corporal de la població i en altres aspectes psicològics. Les experiències de les persones amb alteracions de la conducta alimentària durant la pandèmia i la relació entre la pandèmia i l'ús de xarxes socials poden ser complexes i requereixen més investigació.

Resumen

La pandemia de COVID-19 ha provocado una crisis sanitaria global, y hay una considerable preocupación por su impacto en la salud mental de la población. Diversos/as autores/as han destacado el potencial impacto negativo de la pandemia y del confinamiento en las alteraciones de la imagen corporal. Además, se ha sugerido que la pandemia se podría relacionar con un aumento en el uso de redes sociales, y se sabe que el uso de redes sociales (especialmente un uso centrado en la apariencia física) es un predictor significativo de las alteraciones de la imagen corporal. Asimismo, la comparación de la apariencia física es uno de los procesos clave que actúa como variable mediadora en la relación entre el uso de redes sociales y las alteraciones de la imagen corporal. Sin embargo, la investigación en esta área es todavía limitada y muy pocos estudios han examinado las alteraciones de la imagen corporal, las comparaciones de la apariencia física o el uso de redes sociales durante la pandemia de COVID-19. Además, los estudios longitudinales con datos previos a la pandemia son escasos.

Los principales objetivos de esta tesis fueron los siguientes: (1) validar la escala de comparación de la apariencia física *Physical Appearance Comparison Scale-Revised* (PACS-R) en una muestra española; (2) examinar los niveles de depresión, ansiedad, estrés, autoestima, alteraciones de la conducta alimentaria, insatisfacción corporal e impulso por la delgadez durante los primeros meses de la pandemia, (3) explorar los cambios en el uso de redes sociales (especialmente Instagram), en la insatisfacción corporal y en las comparaciones de la apariencia física durante la pandemia, (4) determinar si el uso de Instagram (frecuencia de uso y uso centrado en la apariencia) se asoció con alteraciones de la imagen corporal y la baja autoestima durante los primeros meses de la pandemia, y (5) explorar si existía una relación entre los cambios en el uso de Instagram a lo largo de la pandemia y la insatisfacción corporal y la tendencia a la comparación de la apariencia física. Un objetivo transversal de la tesis fue centrarnos en personas jóvenes y en mujeres, ya que éstos han sido dos de los colectivos más vulnerables a los efectos de la pandemia, y tanto la insatisfacción corporal como el uso de las redes sociales

centrado en la apariencia física predominan en mayor medida entre los colectivos jóvenes y en mujeres que en otros grupos de población.

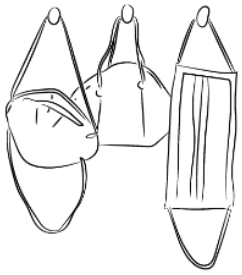
Se realizaron cuatro estudios. Los tres primeros tuvieron un diseño transversal y el cuarto un diseño longitudinal. El primer estudio, cuyo objetivo fue crear y validar la versión española de la PACS-R, incluyó una muestra de 1405 personas de entre 14 y 64 años, que completaron la PACS-R y otros cuestionarios de imagen corporal, alteraciones alimentarias, influencias socioculturales relacionadas con la apariencia, autoestima y comparación social. El segundo y tercer estudio se llevaron a cabo durante los meses iniciales de la pandemia y sus objetivos fueron examinar los niveles de malestar emocional y alteraciones alimentarias (estudio 2), indagar en el uso de redes sociales, las alteraciones de la imagen corporal y la autoestima, y explorar la asociación entre el uso de redes sociales y las alteraciones de la imagen corporal y la autoestima (estudio 3). Un total de 2847 personas entre 14 y 35 años participaron en el segundo estudio, y 2601 mujeres de entre 14 y 35 años participaron en el tercero. El cuarto estudio tuvo como objetivo determinar la evolución del uso de Instagram, la insatisfacción corporal y las comparaciones de la apariencia física a lo largo de la pandemia, y contó con una muestra de 272 mujeres españolas (16-70 años) a las que se las evaluó en cuatro momentos temporales entre noviembre de 2019 (antes del inicio de la pandemia) y julio de 2021.

Los principales hallazgos de la tesis fueron los siguientes: (1) la versión española de la PACS-R tiene excelentes propiedades psicométricas, pudiendo ser una herramienta útil para medir las comparaciones de la apariencia física en poblaciones hispanohablantes; (2) se encontraron niveles graves de depresión, ansiedad y estrés en aproximadamente una cuarta parte de la muestra durante los primeros meses de la pandemia; (3) el confinamiento se asoció a varios cambios percibidos en diferentes áreas vitales; (4) el seguimiento de cuentas centradas en la apariencia en Instagram y la elevada frecuencia de uso de Instagram predecieron de forma significativa niveles elevados de impulso por la delgadez durante los primeros meses de la pandemia; (5) la frecuencia de uso de las redes sociales, así como el número de mujeres que siguen cuentas centradas en la apariencia en Instagram, podrían haber aumentado con la pandemia, aunque se encontraron

resultados contradictorios; (6) la insatisfacción corporal y las comparaciones de la apariencia física aumentaron significativamente a lo largo de la pandemia, aunque no se halló que estos aumentos fueran significativos para aquellas personas con riesgo previo de trastorno de la conducta alimentaria; (7) no se encontraron diferencias significativas en la insatisfacción corporal y en las comparaciones de la apariencia física en función de los cambios en la frecuencia de uso de Instagram o de los cambios en el seguimiento de cuentas centradas en la apariencia a lo largo de la pandemia.

Los resultados sugieren que la COVID-19 y su confinamiento asociado han tenido un impacto en la imagen corporal de la población y en otros aspectos psicológicos. Las experiencias de las personas con alteraciones de la conducta alimentaria durante la pandemia y la relación entre la pandemia y el uso de redes sociales pueden ser complejas y requieren de mayor investigación.

INTRODUCTION



1. Introduction

1.1. Body image and social networks

1.1.1. Body image and body image disturbance

What is body image?

The term *body image* was first coined by Paul Schilder in his book *The image and appearance of the human body* (1935). He defined body image as "the picture of our body which we form in our mind" and argued that everyone had a potentially infinite number of separate body images (Schilder, 1935). Subsequently, Seymour Fisher published scientific papers and books on the *body boundary* construct (Fisher, 1970, 1986). Among other aspects, he considered the impact of behaviour, culture and personality on the phenomenon of body experience. Concurrently, Franklin Shontz (1969) aimed to integrate theory and data from various areas of experimental psychology, conceptualized body experience as multi-dimensional, and applied scientific findings to understand individuals with physical disabilities (Cash, 2004; Shontz, 1969, 1990).

Since then, several definitions have been proposed, and it is often difficult to capture the complexity of the concept in one simple explanation. Cash (2004) refers to body image as a multidimensional construct that encompasses perceptions, attitudes, feelings, beliefs and behaviours regarding one's appearance. Bell and Rushforth (2008), in turn, divide body image into two main elements: the perception of our body (how we *experience* our body, e.g., the evaluation of our size), and an emotional or attitudinal aspect (how we *feel* about our body). These two elements are connected and there are complex interactions between them.

Hence, current conceptualisations of body image tend to include: (1) perceptual aspects (accuracy with which individuals perceive their body size, weight and shape), (2) attitudinal and affective components (satisfaction and feelings that people have toward their appearance and body), (3) a cognitive dimension (thoughts and beliefs that individuals have concerning their appearance and body), and (4) behavioural elements (specific behaviours

related to body image, such as body checking and avoidance of mirrors and public situations) (Tatangelo et al., 2015).

Body image disturbance

Considering that the modern understanding of body image is of a construct with several components, *body image disturbance* can be defined as a dysfunction on any of these elements (perceptual, cognitive, affective or behavioural) (Cash, 2012; Farrell et al., 2006).

Different terms are used in the literature to refer to body image disturbance, such as *negative body image*, *body dissatisfaction* and *body image disorder*, and are often used interchangeably. According to Bell & Rushforth (2008), a *negative body image* can be defined as a discontent with or negative evaluation of some aspects of one's physical appearance, and it can range from mild feelings of unattractiveness to extreme obsession with physical appearance that impairs normal functioning. *Body dissatisfaction*, in turn, is the result of a discrepancy between the perceived and the ideal self, and does not take into consideration the impact this has for the individual in terms of psychosocial functioning or personal distress (Bell & Rushforth, 2008). Finally, the concept *body image disorder* was proposed by Thompson (1992) to refer to a persistent report of dissatisfaction, distress and concern related to appearance, which is associated with some degree of impairment in social relations, social activities or occupational functioning. However, this term has not been widely used in the literature nor is a formal diagnosis. In this thesis, we will generally use the term *body image disturbance* unless we are referring to a specific concept such as *body dissatisfaction*. Also, when referring to other authors' work, we will use the terms employed by the authors.

Body image disturbance is a core symptom of eating disorders. According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), body weight and shape disturbances are among the diagnostic criteria for anorexia nervosa and bulimia nervosa. To be diagnosed with anorexia nervosa, a person must display "disturbance in the way one's body weight or shape is experienced, undue influence of body shape and weight on

self-evaluation, or persistent lack of recognition of the seriousness of the current low body weight". In the case of bulimia nervosa, one of the diagnostic criteria is that "self-evaluation is unduly influenced by body shape and weight" (American Psychiatric Association, 2013). Body image disturbance also occurs in binge eating disorder (Ahrberg et al., 2011; Lewer et al., 2017), even though it is not considered a diagnostic criteria for the disorder, according to the DSM-5.

Body image disturbance is also experienced by individuals who do not have a psychological disorder. Estimates of the extent of body dissatisfaction among both men and women vary, but are consistently high. Fiske et al. (2014) reviewed seven studies examining the prevalence of body dissatisfaction among United States of America (USA) adults, and concluded that it ranged from 11% to 72% for women, and from 8% to 61% for men. Other studies have indicated that girls as young as five years of age have body dissatisfaction, as 40-50% of them report a desire to be thinner (Tatangelo et al., 2015). Similarly, Ricciardelli et al. (2007) reported that 47% of boys aged 8 to 11 years would like to have a thinner body. Calado et al. (2011), in turn, assessed body dissatisfaction in a Spanish sample of students aged 14 to 16 and found that 11.2% of the students scored above the body dissatisfaction cut-off point, and of these students, 24% were boys and 76% were girls.

A disturbed body image tends to precede and predict the development of disordered eating and eating disorders, therefore it is considered a key risk factor for eating disorders (Garner, 2002; Killen et al., 1996; Prnjak et al., 2021; Stice, 2002; Stice & Shaw, 2002), and it is also a predictor of relapse after successful treatment (Fairburn et al., 1993; Freeman et al., 1985). Moreover, body image disturbance has been found to predict disturbed eating, compensatory behaviours and binge eating (Farrell et al., 2006). Some studies have also linked body image disturbance with poor physical and psychosocial functioning (Wilson et al., 2013), depression (Jackson et al., 2014), anxiety (Rostampour et al., 2022), low self-esteem (Aparicio-Martinez et al., 2019; van den Berg et al., 2010), and quality of life impairment (Griffiths et al., 2017).

Even though body image disturbance affects individuals regardless of their gender identity, sexual orientation, age and ethnicity, some groups are more vulnerable than others. Some studies have compared men and women with respect to body image disturbances, and the vast majority of them report greater body dissatisfaction in women than in men (Ålgars et al., 2009; Demarest & Allen, 2000; Fallon et al., 2014; Lawler & Nixon, 2011; Quittkat et al., 2019; Tiggemann, 2004; Von Soest & Wichstrøm, 2009). However, the relationship between body image and gender is complex, and while women generally experience body image concerns specifically related to the desire for thinness, men tend to have muscularity-oriented body image concerns (Hoffmann & Warschburger, 2017; Murray et al., 2017; Murray & Touyz, 2012).

Body image disturbance also plays a relevant role in sexual and gender minority individuals. A systematic review (Jones et al., 2016) concluded that body dissatisfaction is core to the distress trans people experience, and this dissatisfaction might put some individuals at risk for disordered eating. Richburg & Stewart (2022) used an intersectional framework to investigate group differences among dimensions of gender identity within a sexual and gender minority sample, and concluded that cisnormativity (the assumption that an individual's sex assigned at birth will always align with their gender identity) was an influential factor for body image, and masculine but not feminine trait identification predicted body appreciation and drive for muscularity.

Regarding differences among sexual orientations, Dahlenburg et al. (2020) concluded in their systematic review and meta-analysis that lesbian women experience lower body dissatisfaction compared to heterosexual women, but more when compared to gay men, and gay men experience greater body image disturbance compared to heterosexual men.

With regards to age, some studies have suggested that body dissatisfaction is higher in adolescence or young adulthood than in older ages (Baker & Gringart, 2009; Bully & Elosua, 2011; Esnaola et al., 2010), or that youth are increasingly dissatisfied with their bodies as their body mass index (BMI) increases from middle school to young adulthood (Bucchianeri et al., 2013). Other studies have indicated that while body appreciation is positively

associated with age, body dissatisfaction remains relatively stable across the life span (Quittkat et al., 2019; Tiggemann, 2004; Tiggemann & McCourt, 2013), therefore these two constructs are not interchangeable. Quittkat et al. (2019) concluded that body dissatisfaction was unaffected by age in women, but age predicted a lower level of the importance of appearance (i.e., importance or investment put into being "good-looking") in men.

Differences in body image disturbances among racial and ethnic groups have also been found. White and Hispanic women seem to have greater body dissatisfaction than Black or African American women, although the difference has been reported to be small (Grabe & Hyde, 2006; Kronenfeld et al., 2010). However, contradictory findings have been found across studies, with some research suggesting no differences among racial groups in body dissatisfaction (DeLeel et al., 2009)

Considering the high prevalence and impact of body image disturbance across the population, it is of paramount importance to develop and implement prevention and treatment programmes, and to use validated assessment measures.

Several **prevention** programmes have emerged during the last decades. The prevention of body image disturbance and body dissatisfaction is often included in eating disorders prevention programmes and in integrated prevention programmes for obesity and eating disorders. School-based approaches are the most common ones, although ecological, activism and public policy approaches have also been used. When school-based programmes were first employed in the 1980s, they were mainly psychoeducational and provided information about nutrition and the harmful effects of unhealthy dieting, and tried to improve body image through the analysis of the cultural origins of female body ideals (Yager & O'Dea, 2008). As they were not found to be effective in improving body image concerns and behaviours, new interventions were created (Cuzzolaro & Fassino, 2018). Media literacy, self-esteem, cognitive dissonance, and cognitive-behaviour therapy approaches have been empirically supported to be effective prevention strategies (Harrer et al., 2020; Le et al., 2017; Lewis-Smith et al., 2023; Tatangelo et al., 2015; Watson et al., 2016). More specifically, regarding *universal*

prevention programmes, media literacy has been found to reduce body shape and weight worries in men and women (Le et al., 2017). Several authors suggest that schools should incorporate universal eating disorder prevention interventions into their curricula, which often include a core module on body image disturbances, as these interventions can improve children's body esteem, self-esteem, and internalization of appearance, although they might not significantly improve children's body satisfaction (Chua et al., 2020). In the case of *selective* prevention, cognitive dissonance interventions have been linked with reduced eating disorder symptoms in adolescent and young women. In contrast, some *indicated* prevention programmes have not been found to be effective in reducing eating disorders' risk factors (Cuzzolaro & Fassino, 2018). However, research in this field is still needed.

A whole variety of **assessments** are available to capture the different components of body image. However, several factors contribute to increasing the complexity of the evaluation of this construct. For example, body image experiences vary over time and depending on different situations. Also, age, gender and ethnicity, as mentioned previously, should be taken into consideration when assessing body image. Comprehensive lists of methods of assessment of body image disturbance can be found in Cuzzolaro & Fassino (2018) and Shroff et al. (2019). Table 1 provides a summary of some of the most widely used questionnaires or scales and their main characteristics. Other methods of assessment of body image include figure rating scales (Jayawardena et al., 2021), interview strategies (e.g., Fairburn & Cooper, 1993) , virtual reality methods (Ferrer-García & Gutiérrez-Maldonado, 2012), interactive computer programs such as the Body Image Assessment software (Ferrer-García & Gutiérrez-Maldonado, 2008) or optical distortion methods such as the distorting mirror technique (Gardner & Brown, 2011).

Table 1. Summary of some of the most widely used body image disturbance questionnaires.

Measure and authors	Description
Body Shape Questionnaire (Cooper et al., 1987)	34-item tool that measures adults' concerns related with body shape and size.
Assessment of Body-Image Cognitive Distortions (Jakatdar et al., 2006)	37-item measure that can be used to assess body image-related cognitive errors or distortions in different situations.
Multidimensional Body-Self Relations Questionnaire (Brown et al., 1990)	69-item self-report inventory that assesses the self-attitudinal aspects of body image, including evaluative, cognitive, and behavioural components.
Eating Disorders Inventory-3 (Garner, 2004)**: Body Dissatisfaction and Drive for Thinness scales**	The Eating Disorder Inventory is a self-report questionnaire used to assess the presence of eating disorders, and consists of 91 items organized into 12 primary scales. The Body Dissatisfaction scale contains 10 items that assess discontentment with the overall shape and with the size of those regions of the body of extraordinary concern to those with eating disorders, and the Drive for Thinness scale comprises 7 items that assess the desire to be thinner, concern with dieting, preoccupation with weight and fear of weight gain
Body-Image Ideals Questionnaire (Cash & Szymanski, 1995)	22-item scale that evaluates body image taking into account one's perceived discrepancy from and degree of investment in personal ideals on multiple physical attributes.
Body Image Disturbance Questionnaire (Cash et al., 2004)	7-item measure that assesses a broad array of aspects of body image disturbance.

Regarding **treatments**, the majority of therapies that aim to treat body image disturbance use cognitive and behavioural techniques (Farrell et al., 2006). According to a systematic review of interventions on body image and disordered eating outcomes among women in midlife (Lewis-Smith et al., 2016), the interventions that have demonstrated significant and sustained effects on body image disturbance are based on cognitive behavioural therapy (CBT) and acceptance and commitment therapy (ACT). Considering that body image disturbance involves a dysfunction in any of the affective, cognitive or behavioural components of body image, CBT approaches typically use techniques to address these disturbances (Thompson et al., 1999).

Various forms of CBT for body image disturbance have been found to be more effective than a non-specific treatment and than no treatment (Bhatnagar et al., 2013; Butters & Cash, 1987; Lewis-Smith et al., 2016, 2019; Mountford et al., 2015; Rosen et al., 1989; Shafran et al., 2009). These approaches often include cognitive restructuring and cognitive dissonance strategies, behavioural experiments, size perception training, exposure techniques, body functionality appreciation strategies, or the use of virtual reality (Alleva et al., 2015; Farrell et al., 2006; Ferrer-García & Gutiérrez-Maldonado, 2012; Lewis-Smith et al., 2019). Third-wave CBT approaches have also become increasingly popular forms of intervention for body image concerns (e.g., ACT, dialectical behavioural therapy, mindfulness) (Fogelkvist et al., 2020; Lewis-Smith et al., 2019; Stewart, 2004). Other approaches and methodologies have been used to tackle body image disturbance, such as fitness training, media literacy, self-esteem enhancement techniques, psychoeducation, multisensory approaches, feminist approaches, psychodynamic strategies, and antistigmatisation and radical acceptance procedures (Alleva et al., 2015; Cash & Pruzinsky, 2002; Cash & Smolak, 2011; Keizer et al., 2019; O'Dea, 2004; Thompson et al., 1999).

1.1.2. Social network sites (SNSs)

Definitions

The use of social media has grown substantially over the last decade, and it has transformed the way in which people communicate and interrelate in

society. The term *social media* is often used as an umbrella term that includes a variety of online platforms, including blogs, business networks, collaborative projects, enterprise social networks, forums, microblogs, photo sharing, products review, social bookmarking, social gaming, video sharing, virtual worlds and social network sites (SNSs), as described by Aichner et al. (2021). Hundreds of researchers have formulated quite varying definitions of social media, and there is no single or community accepted definition, which can make it difficult for researchers to interpret and apply research findings. A review of social media definitions proposed from 1994 to 2009 can be found in Aichner et al. (2021). For example, Bishop (2019) defined social media as "any online resource that is designed to facilitate engagement between individuals."

What seems clear is that SNSs are included within the umbrella of social media, even though some researchers use the two terms interchangeably. Kaplan & Haenlin (2010) indicate that there are various types of social media that need to be distinguished further, and propose a classification based on theories in the field of media research and social processes. They suggest that social media sites differ on their degree of "social presence" (the acoustic, visual, and physical contact that can be achieved between two communication partners), "media richness" (the amount of information that can be transmitted in a given time interval), and "self-presentation/self-disclosure" (the degree of self-disclosure required, and the type of self-presentation allowed). This leads to SNSs being classified as a subtype of social media that has high levels of self-presentation/self-disclosure, and medium levels of social presence and media richness. An extensive explanation on this can be found in Kaplan & Haenlin (2010).

According to Ellison & Boyd (2013), a SNS can be defined as "a networked communication platform in which participants 1) have uniquely identifiable profiles that consist of user-supplied content, content provided by other users, and/or system-level data; 2) can publicly articulate connections that can be viewed and traversed by others; and 3) can consume, produce, and/or interact with streams of user-generated content provided by their connections on the site." SNSs include sites such as Twitter, Facebook, and Instagram. Instant messaging platforms, in contrast, are generally not considered to be SNSs, as

their main objective is real-time communication among users, and they do not promote one-to-many interactions (e.g., sharing a public post for others to like and comment).

The terms *social network sites*, *social networks*, *social networking*, *online social networks* or *social networking sites* are often used as synonyms. In this thesis, the term *social network sites* will be used following Ellison & Boyd's (2013) rationale, as the term emphasizes that these are sites that enable individuals to articulate public lists of connections, and this ability is what differentiates SNSs from earlier forms of online interaction spaces. Also, the term *social network sites* highlights the role of the network (as a noun) as opposed to the practice of networking (as a verb).

Trends in SNSs use

The appealing features of SNSs have attracted billions of users worldwide. Using SNSs is a daily activity for many people, and users often spend multiple hours a day browsing and posting on their accounts (DataReportal, 2023).

According to DataReportal's report on social media statistics (2023), Facebook is the world's most widely used SNS, with 2.958 billion monthly active users. It is followed by Youtube (potential advertising reach of 2.514 billion users), Instagram (2 billion monthly active users) and TikTok (its ads can potentially reach 1.051 billion adults over the age of 18 each month).

The situation is similar in Spain: the most widely used SNS is Facebook (in terms of number of users), and it is followed by Instagram, Youtube, Twitter and TikTok. However, Facebook's popularity has dropped during the last years, especially among young people, and TikTok is becoming more popular every year. When people are asked about their preferences, Instagram is reported as the preferred SNS. Facebook, in turn, is the SNS that has been abandoned the most in 2022. Moreover, Instagram is the SNS with the highest frequency of use in Spain (68% of social media users use Instagram every day), followed by Facebook (65%), TikTok (59%) and Twitter (54%) (Acebes & Montanera, 2022).

There are significant differences in SNSs use across age groups. According to Acebes & Montanera's (2022) report, individuals that were between 18 and 24

years old in 2022 (*Generation Z*) are the ones that spend more time using SNSs in Spain. The SNS that they use the most is Instagram (96% of them use it), followed by Youtube (78%), Twitter (53%) and TikTok (45%). Instagram is also the most used SNS among Spanish *Millennials* (individuals aged 25-40 in 2022) and *Generation Alpha* (individuals aged 12-17 in 2022), but it is followed by Facebook in Millennials (70% of them use Facebook) and by TikTok in the case of Generation Alpha (77% of them use TikTok). People aged between 41 and 70 years old use Facebook to a greater extent compared to other age groups. Regarding gender differences, women tend to spend more time using SNSs than men (Acebes & Montanera, 2022; Mingoia et al., 2019; Murray et al., 2016), and they are more likely to use SNSs to search for information and compare themselves to others as opposed to men, who are more likely to look at other people's profiles to find friends (Haferkamp et al., 2012). Also, according to Marengo et al. (2018), women are more likely to use highly visual SNSs, such as Instagram and Snapchat, compared to men.

Considering Instagram's current popularity, it is worth reviewing some of its key characteristics. The main functionality of Instagram involves sharing photographs and short videos, and it provides users the chance to use various photo-enhancing filters. With these filters, users can manipulate their photographs to be more visually appealing. Instagram has a direct messaging function and allows users to "like" and comment on other users' videos and photographs. It also allows using "hashtags" (a word or phrase preceded by a hash sign to identify digital content on a specific topic), with captions that create links to user content. As a result, global sharing of specific items, categorized with hashtags, can occur instantaneously if the user profile is public. Finally, Instagram has a "search and explore" tab that shows videos and photographs from public profiles, based on the users' search history. This way, users are introduced to new content without having to search specifically for that content (Sherlock & Wagstaff, 2019).

As mentioned before, TikTok is a fast-growing SNS, especially popular among very young people. Even though it shares many similarities with Instagram, TikTok is solely focused on short-form videos. Anybody with a TikTok account can create video content that includes music, filters, and even visual effects.

Also, TikTok has a “for you” section where users can discover new content served up by the TikTok algorithm.

Hence, both Instagram and TikTok are visually oriented SNSs, in contrast with other SNSs such as Facebook or Twitter, which allow users to share images or videos, but this is not their main or only purpose.

Psychological impact of the use of SNSs

As SNSs are increasingly becoming an important part of millions of people’s everyday lives, warnings about the supposedly negative consequences are widespread. Several researchers have tried to shed light on the relationship between SNSs use and different mental health domains.

For example, the link between SNSs use and psychological well-being has been one of the studied areas. According to the review conducted by Erfani & Abedin (2018), the use of SNSs is both positively and negatively related to users’ psychological well-being. The review identified mediators (social capital, social support, perceived social support, self-esteem, and authentic self-presentation) through which SNSs can improve the psychological well-being of individuals, as well as areas that can negatively impact users’ psychological well-being (“injudicious access” and “overly casual access”). Appel et al. (2020), in contrast, concluded that the available meta-analytic evidence casts doubt on the assumption of substantial associations between SNSs use and well-being. Valkenburg (2022), in turn, conducted an umbrella review and found contradictory findings, concluding that well-being and ill-being components should be investigated as two separate continuums.

Frost & Rickwood (2017) indicated in their systematic review that Facebook use is associated with Facebook addiction, anxiety, depression, drinking cognitions and alcohol use, and other mental health problems. Across all domains, brooding, rumination, social comparison, and appearance comparison acted as mediators of poor mental health, and there seemed to be a trend of passive Facebook use predicting poorer mental health. However, they found that Facebook use could also be related with psychosocial

benefits, such as perceived emotional and social support, reduced feelings of isolation, enhanced wellbeing, and greater health and wellness satisfaction.

Other reviews and meta-analysis have suggested that the use of SNSs could be related to depressive symptoms, anxiety, loneliness, body image disturbance, poor sleep quality, poor mental health indicators, thoughts of self-harm and suicide, increased levels of psychological distress, cyberbullying, fear of missing out, and decreased life satisfaction (Keles et al., 2020; Sadagheyani & Tatari, 2021; Vahedi & Zannella, 2021), despite having mixed findings from individual studies, some of them showing positive effects of using SNSs. Appel et al. (2020) indicated that meta-analytic summaries show no strong linear link between the overall intensity of SNSs use and self-reported depression, loneliness, self-esteem, life satisfaction or school achievement. They did found, however, small to moderate associations between narcissism and SNSs use (Appel et al., 2020). Regarding self-esteem, which is an important predictor of well-being (Diener & Diener, 1995), research findings are mixed and ambiguous, since some studies report a positive association between SNSs use and self-esteem (Gonzales & Hancock, 2011; Valkenburg et al., 2006), whereas others find negative or insignificant relationships (Muench et al., 2015; Vogel et al., 2014). Krause et al. (2021) conducted a systematic review and developed a framework which states that self-esteem is affected by social comparison processes, social feedback processing, and self-reflective processes. As a result, when a SNS is used to compare oneself with others, it mostly results in decreases in users' self-esteem, whereas receiving positive social feedback from others or using SNSs to reflect on one's own self is mainly associated with benefits for users' self-esteem (Krause et al., 2021).

Considering these heterogeneous findings, researchers tend to conclude that SNSs are not "good" or "bad" *per se*, as the relationships are too complex for straightforward statements. The mental health consequences of using SNSs usually depend on several variables, such as how these sites are used (a passive use has been found to predict a decline in well-being), the type of SNS that is used (some studies support positive effects of Facebook use and an adverse impact of Instagram use), the quality of use (negative quality and problematic SNSs use have a stronger association with negative effects than

the quantity of SNSs use), sociodemographic issues (in the United States, the positive well-being effects of SNSs are experienced mainly by White, high-income populations, and the adverse effects of Instagram are observed on younger and Black populations), insomnia and other sleep-related factors, perceived social support, rumination, social comparison tendency, personal traits, and socio-cultural factors, among others (Appel et al., 2020; Erfani & Abedin, 2018; Frost & Rickwood, 2017; Jaidka, 2022; Keles et al., 2020; Masciantonio et al., 2021; Vahedi & Zannella, 2021; Valkenburg, 2022; Verduyn et al., 2021). Hence, understanding individual factors and mechanisms that comprise risk and protective factors is key to understand the associations between SNSs use and mental health consequences.

Moreover, it is often difficult to compare studies that analyse the psychological impact of SNSs use, as there are significant differences in their research design approaches. Also, studies are highly heterogeneous in what they measure exactly when they assess SNSs use. While some focus on the time spent on SNSs (in general or on a specific SNS, generally Facebook), others measure the frequency of checking SNSs, a combination of both aspects, or in some cases it is not clearly defined. Other studies measure variables such as the number of Facebook friends or the type of SNSs use (e.g., active vs. passive use). Furthermore, the majority of investigations employ single-item self-reports to assess SNSs use, which might lead to reduced accuracy and validity (Araujo et al., 2017; Scharkow, 2016). Hence, there is diversity in the operationalization and measurement of SNSs use. Finally, there are few longitudinal studies, and more inclusive sampling practices are needed, as several articles mainly focus on students and young people.

1.1.3. Relationship between SNSs use and body image disturbance

SNSs and body image disturbance: review of reviews

The use of SNSs, apart from being related to the above-mentioned aspects, has also been linked to body image and body image disturbance.

Hundreds of articles have been written during the last decade regarding this topic, and the literature on the subject is growing rapidly. Different reviews and meta-analyses have been published within the last few years (de Valle et al., 2021; Faelens et al., 2021; Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Ryding & Kuss, 2020; Saiphoo & Vahedi, 2019; Silva et al., 2020; Vandenbosch et al., 2022). This section aims to provide a review of reviews.

According to Saiphoo & Vahedi's (2019) findings in their meta-analytic review, there is a small, positive relationship between the use of social media (a term that in most studies is used a synonym for SNSs) and body image disturbance. As the authors discuss, social media use could not be as strongly associated with body image disturbance as traditional media, and this might be due to the fact that users may recognize that content on social media is idealized, or because of differences in the diversity of content between these mediums, among other factors. Nevertheless, the fact that the effect size is small does not mean that the finding is unimportant.

The following aspects were found to be significant moderators in the relationship between SNSs use and body image disturbance in Saiphoo & Vahedi's (2019) meta-analytic review:

- **Type of social media use**: an appearance-focused use of social media seems to be more strongly related to body image disturbance than general, non-specific social media use.
- **Dimensions of body image**: the association between SNSs and body image disturbance is stronger for the more specific elements of body image (cognitive and behavioural), compared to the general/evaluative dimension. The cognitive dimension of body image is often operationalized as appearance ideals, so this could suggest that SNSs are associated with thin-ideal internalization and with appearance-based comparisons. This is consistent with the tripartite influence model, which will be explained below. Similarly, the fact that the use of SNSs is linked with the behavioural dimension of body image could suggest that SNSs use is associated with disordered eating behaviours. These findings might indicate that using SNSs does not necessarily lead to directly feeling worse about one's body but to thinking or behaving

in different ways, which might then indirectly impact one's satisfaction with their body.

- **Age:** the relationship between SNSs use and body image disturbance is inversely correlated with age. Different mechanisms might explain this finding. For example, if older adults spend less time on SNSs, they might be less likely to compare themselves to content on SNSs, and therefore less likely to experience body image disturbance as a result. Other potential mechanisms are explained in Saiphoo & Vahedi (2019).
- **Country/Culture**: Saiphoo & Vahedi (2019) concluded that the relationship between SNSs use and body image disturbance was stronger in studies conducted in Australia, compared to those carried out in North America, Europe, and Asia. The authors indicated that Australia's population was almost entirely Caucasian at the time of conducting the review, and less diverse than other continents, and therefore this finding is likely related to ethnicity: individuals who identify as Caucasian are probably more influenced by SNSs compared to non-Caucasians.

Other reviews have also concluded that SNSs use is related to body image disturbance (de Valle et al., 2021; Faelens et al., 2021; Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Ryding & Kuss, 2020; Silva et al., 2020; Vandenbosch et al., 2022). This includes not only body dissatisfaction but also drive for thinness, weight and muscle dissatisfaction, internalization of the thin-ideal, body surveillance, self-objectification and appearance comparisons (Fardouly & Vartanian, 2016; Ryding & Kuss, 2020). Although early work indicated that a higher frequency of use and overall time spent on SNSs were linked with body image disturbance, a growing body of research suggests that it is appearance-based activities on social media which are the most important. More specifically, viewing appearance-ideal images and digitally edited images on SNSs can have a negative impact on individuals' body image (de Valle et al., 2021; Faelens et al., 2021; Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Ryding & Kuss, 2020; Silva et al., 2020; Vandenbosch et al., 2022). Other activities or types of SNSs use, such as online grooming behaviours (Fardouly & Vartanian, 2016), passive SNSs use (Ryding & Kuss,

2020), greater emotional investment or negative feedback seeking (Holland & Tiggemann, 2016) have been found to be related to body image disturbance.

Moreover, the need to consider the impact of each SNS separately has also been highlighted, as not all social media platforms impact people's body image in the same manner (Vandenbosch et al., 2022). While almost all studies before 2017 focused on Facebook, Instagram and Snapchat have been examined during the last years, and research on TikTok is beginning to be published. As Vandenbosch et al. (2022) point out, there are differences in the way people use different platforms, which have implications for body image. For instance, the use of photo-based platforms (e.g., Instagram or Snapchat) relates more consistently than more text-based platforms (e.g., Facebook or Twitter) to body image disturbances, and these relationships are similar across genders. Photo-based platforms might be worse for body image because they focus to a greater extent on physical appearance: they foster an environment where users are more likely to post appearance-focused content, and therefore are likely to view appearance-focused content. This leads to users having more opportunities to self-objectify (i.e., apply an observer's perspective to their own body), internalize appearance ideals, and make negative appearance comparisons (Vandenbosch et al., 2022). The first studies examining TikTok, a video-based platform, also suggest that regular use of TikTok might be harmful to women's body image, and body surveillance and appearance comparison mediate the relationship between TikTok use and body dissatisfaction (Bissonette Mink & Szymanski, 2022). More information about the role of appearance comparisons will be provided in the next sections.

SNSs have some unique features that are key in their relationship with body image disturbance. For example, some authors have started to address the impact of creating and posting self-images ('selfies') on SNSs, and have reported that taking and editing, but not posting, selfies might be harmful to body image. Also, 'likes' and comments on posted images might also play a significant role: it has been suggested that Instagram images with comments idealizing the portrayed appearance lead to increased body dissatisfaction (Vandenbosch et al., 2022).

The gender dimension should also be considered in the relationship between SNSs and body image disturbance. As explained in the section *'Trends in SNSs use'*, women tend to spend more time on SNSs and to use highly visual SNSs as opposed to men. This results in higher weight and appearance concerns and body dissatisfaction (Ryding & Kuss, 2020). Also, as indicated before, women are more likely to use SNSs to search for information and compare themselves, which might suggest that women use SNSs more frequently to seek and obtain certain gratification regarding appearance comparison (Ryding & Kuss, 2020). This aligns with Silva's et al. (2020) statement concluding that the female audience seems to be more susceptible to media influences on body satisfaction. However, most of the studies have focused on women samples, therefore gender differences might not be accurately reflected. Some studies show that the frequent use of SNSs predicts greater body image disturbance among men and women (Silva et al., 2020).

Some researchers have recently started to examine social media content that is supposedly aimed at promoting a more positive body image or a healthy lifestyle. This includes body-positive posts (content that is deliberately designed to be body positive, aimed at combating unattainable appearance ideals, promoting body acceptance, and encouraging body diversity), fitspiration posts (images and text aimed at promoting a healthy lifestyle through exercise and healthy eating), and the use of disclaimer labels or captions (used in some countries to point out that some images have been digitally altered and are unrealistic), among others. As Vandenbosch et al. (2022) describe in their article, exposure to fitspiration content has been linked with increased body dissatisfaction, disclaimer labels do not seem to be a useful approach for reducing the impact of idealized social media images, and viewing body-positive content has been found to improve body image in some studies, but others conclude that it might lead to increased self-objectification. Future research will probably shed light on the impact of other kinds of social media contents that are currently found in SNSs (especially Instagram and TikTok), such as body neutrality content (images and text that promote a "middle ground" between the polarising messages of loving or hating one's body).

It should be noted that empirical studies and reviews that have examined the link between SNSs use and body image disturbance have some limitations. For example, the terms social media and SNS are often used interchangeably, even though they are not the same, as it has been previously mentioned in this thesis. This might impact the conclusions drawn from the reviews. Also, due to the cross-sectional nature of many studies, causal inferences should be drawn with caution. Finally, because of the variety of measures employed in the studies (both for SNSs use and for body image disturbance), comparison between specific outcome variables might be difficult.

Mechanisms and theoretical formulations

Various theoretical models have been used to explain the relationship between sociocultural factors and body image, and researchers have increasingly used these theories to frame their research on SNSs and body image disturbance (Tylka et al., 2023). The aim of this section is to briefly review three of these models (the most widely known ones) and explain how they have been used to link SNSs use and body image. A more extensive explanation on this can be found in Tylka et al.'s (2023) recent article.

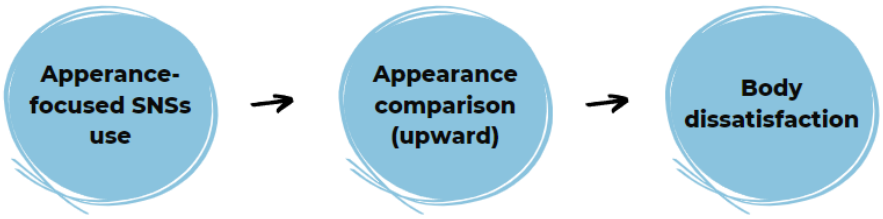
- **Social comparison theory** (Festinger, 1954)

Festinger's social comparison theory posits that people tend to search out standards to which they can compare themselves as a means to determine their own progress and standing in life (Festinger, 1954). These comparisons can be *upward* (comparisons to individuals one believes are better off than oneself), *downward* (comparisons to individuals one believes are worse off than oneself), or *lateral* (comparisons to individuals one believes are similar to oneself). It has been suggested that the social comparison theory might be useful to understand not only comparisons related to abilities and opinions, but also appearance comparisons, as there is a large drive to compare oneself to group norms in the case of body image (Heinberg & Thompson, 1992; Strahan et al., 2006; Taniguchi & Ebesu Hubbard, 2020). Taking into consideration that western societies promote beauty ideals that are unrealistic and unattainable for a great part of the population, individuals are likely to experience body dissatisfaction when they compare their bodies to

other people's bodies or to the standards of physical attractiveness. Several studies support the negative impact of appearance comparisons, especially upward appearance comparisons, on women's and men's body image (Fardouly & Vartanian, 2016; Myers & Crowther, 2009; Want, 2009). Figure 1 shows a simple representation of this theory.

As Tylka et al. (2023) indicate, upward social comparisons are likely to occur when people use SNSs, as individuals are exposed to ideal images that are often heavily edited and/or filtered and can be accessed at any time. SNSs provide the opportunity for rapid and numerous appearance-based comparisons, and for users to compare themselves with their peers in addition to celebrities and models. In fact, appearance-focused social media use has been conceptualized as a predictor of body and appearance comparisons. In turn, as it will be further explained in the section '*The role of appearance comparisons*', body/appearance comparison has been found to be a mediating or moderating variable in the relationship between SNSs use and body image disturbance.

Figure 1. Representation of social comparison theory as it relates to body image disturbance and SNSs use.



Note: Adapted from Tylka et al. (2023).

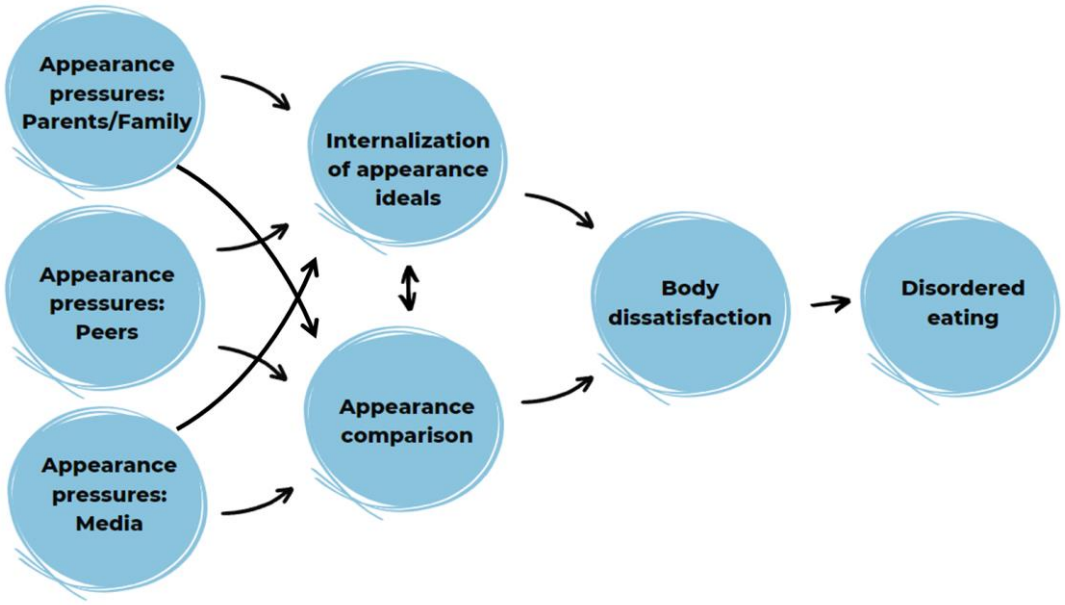
- **Tripartite influence model** (Thompson et al., 1999)

According to the tripartite influence model, appearance comparisons and internalization of appearance ideals act as mediating variables for the relationship between sociocultural influences (appearance-related pressures

from peers, parents, and media) and body dissatisfaction, eating disturbances, and other psychological outcomes (Thompson et al., 1999; see Figure 2). Research supports these conceptualized pathways with samples of various ages, genders, gender identities, sexual orientations, ethnicities, and countries (Tylka et al., 2023).

SNSs can be conceptualized as a social influence (social media appearance pressures), alongside the other social influences proposed in the model (appearance pressures from peers, parents, and traditional media). Then, appearance comparison and internalization of appearance ideals might act as mediators, associating social media appearance pressures and appearance-focused SNSs use to body dissatisfaction (Tylka et al., 2023). The applicability of the tripartite influence model in explaining the link between SNSs use and body image disturbance has been supported by several authors (de Valle et al., 2021; Jarman et al., 2021; Jung et al., 2022; Keery et al., 2004).

Figure 2. Representation of the tripartite influence model.



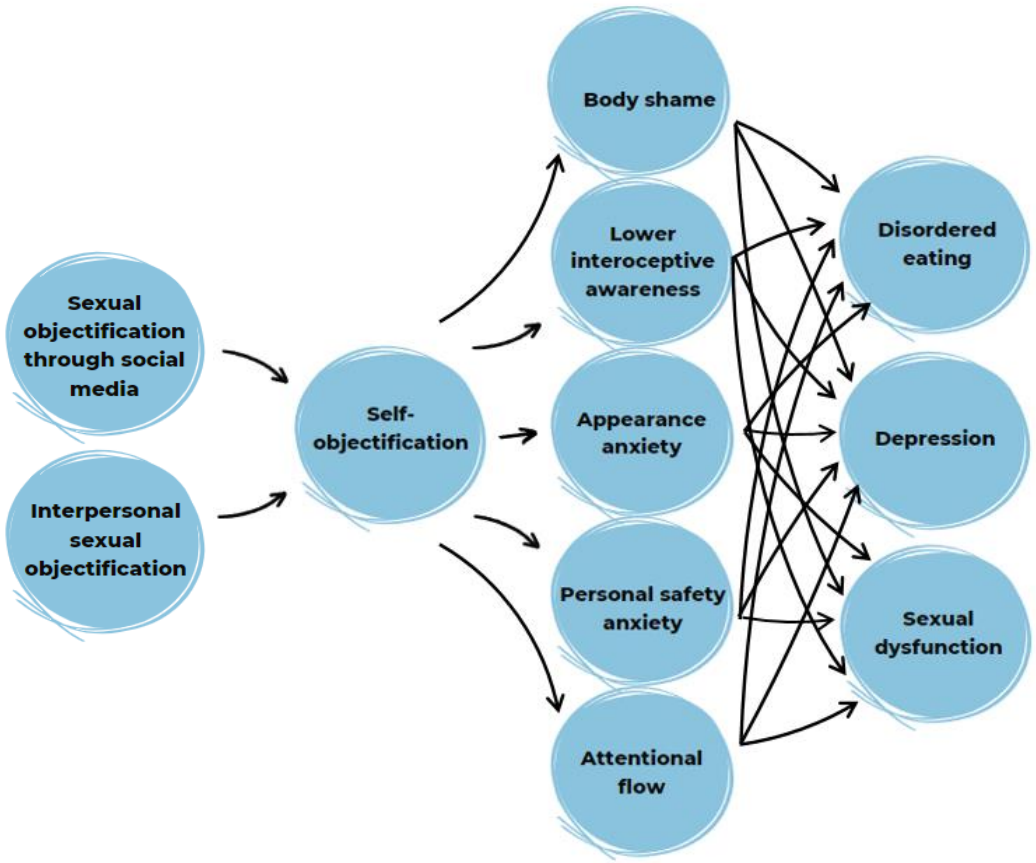
Note: Adapted from Thompson et al. (1999) and Tylka et al. (2023).

- **Objectification theory** (Fredrickson & Roberts, 1997)

Objectification theory posits that women are typically acculturated to internalize an observer's perspective as a primary view of their physical selves (Fredrickson & Roberts, 1997). Sexual objectification (i.e., when women are treated and perceived as mere objects) can occur through many forms (e.g., sexualized gazing, unsolicited sexualized commentaries, sexually objectifying media and pornography, sexual harassment and stalking, sexual violence, rape), and they all involve reducing girls and women to their physical appearance, treating them as objects that exist for the pleasure of others, and/or seeing their bodies and appearance as something that represents them. These experiences happen regularly in the lives of girls and women, and as a consequence many women interiorize this objectifying gaze and turn it on themselves, or eventually self-objectify (i.e., they view their own body as belonging less to them and more to others, valuing their own observable physical appearance attributes to a greater extent than other attributes, and monitoring how they look to others anticipating that they will be evaluated based on their appearance). Once self-objectification is in place, women might experience shame and anxiety about the body, and disruptions to bodily connection and mental concentration. This is then associated with an increased vulnerability to depressed mood, sexual dysfunction, and disordered eating (Tylka et al., 2023). Figure 3 displays the main variables involved in objectification theory.

Sexual objectification of women can be constantly found in all forms of media. It has been suggested that SNSs (especially highly visual SNSs) essentially require users to view themselves from a third-person perspective and anticipate how others will view and treat them, due to SNS's features of editing, manipulating, curating and posting pictures of oneself, and their "goal" of attracting followers (Tylka et al., 2023). Different studies have linked SNSs use (especially a photo-based use) and self-objectification among women and men (Cohen et al., 2018; Feltman & Szymanski, 2018; Hanna et al., 2017; Karsay et al., 2018).

Figure 3. Representation of objectification theory.



Note: Adapted from Tylka et al. (2023).

Other models have been proposed to explain the relationship between sociocultural factors and body image, and they have sometimes been used to describe the impact of SNSs use on body image. These include the dual pathway model (Stice et al., 1996), the developmental theory of embodiment (Piran, 2002, 2016, 2019), Cash's cognitive behavioural model (Cash & Pruzinsky, 2002; Cash & Smolak, 2011), the acceptance model of intuitive eating (Avalos & Tylka, 2006), cultivation theory (Gerbner & Gross, 1976), uses and gratifications theory (Katz et al., 1973), and the development of critical body awareness (Rodgers & Laveway, 2022). A detailed explanation of these models can be found in Tylka et al. (2023), Puccio et al. (2016) and Lewis-Smith et al. (2019).

The role of appearance comparisons

As it has been described in the previous section, several studies have reported that regularly comparing one's appearance to others (particularly to those who are seen as more attractive than oneself) often leads to body image disturbance (Fardouly & Vartanian, 2016; Myers & Crowther, 2009; Tylka et al., 2023; Want, 2009). Moreover, appearance social comparison has been conceptualized as a cognitive process particularly pertinent to SNSs, which mediates or moderates the relationship between SNSs use and body image disturbance, hence it accounts for the relationship between SNSs use and body image in women and men (Fardouly, Willburger, et al., 2018; Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Perloff, 2014; Ryding & Kuss, 2020; Silva et al., 2020; Tylka et al., 2023). It has been suggested that the body image of women who have a greater tendency to compare their bodies to others may be more negatively impacted by appearance-focused SNSs use (Tylka et al., 2023).

Appearance comparisons have been associated with self-objectification, drive for thinness, internalization of thin ideals, body surveillance, body shame, weight and muscle dissatisfaction, eating disturbances, thoughts of dieting and exercising, body dysmorphic disorder, negative affect, low self-esteem and decreased mood (Davison & McCabe, 2005; Fardouly et al., 2015, 2017; Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Ridolfi et al., 2011; Ryding & Kuss, 2020; Tylka & Sabik, 2010). Hence, it is key to consider the role of appearance comparisons in the context of SNSs and body image research. The speed and ease with which people connect to their peers on SNSs provides many opportunities for frequent and effortless social comparisons, and the drive for self-evaluation leads individuals to seek out comparisons with similar rather than dissimilar others (according to social comparison theory), therefore peers provide more important appearance-comparison targets than models or celebrities (Holland & Tiggemann, 2016).

While the association between appearance comparison tendency and body image disturbance has been consistently demonstrated in women, the findings are less consistent in men. For example, Halliwell & Harvey (2006) found that there was a significant correlation between peer comparison

tendency and body dissatisfaction both in adolescent boys and girls, but Humphreys & Paxton (2004) reported that the association was not significant among boys. Furthermore, the literature suggests that women tend to focus on their weight when they compare themselves, while men's comparisons are often related to muscularity (Fisher et al., 2002). Also, men seem to engage in fewer appearance comparisons compared to women, and the effect of these comparisons might be less associated with negative feelings about their body (Carlson Jones, 2004; Davison & McCabe, 2005, 2006; Myers & Crowther, 2009). It has been suggested that inconsistent findings among men could be due to the measures used, as most of the commonly used body dissatisfaction and disordered eating measures have been developed and validated in female samples. Therefore, differences across genders might be influenced by instrument bias (Darcy & Lin, 2012).

Given the importance of appearance comparisons in the context of SNSs use and body image disturbance, it is essential to have a measure to adequately assess one's tendency to engage in physical appearance comparisons. In this sense, some scales have been developed. For example, the Body Comparison Scale (BCS; Thompson et al., 1999) measures the frequency in which a person compares specific body sites to those of other individuals, and the Upward Physical Appearance Comparison Scale (UPCS) and Downward Appearance Comparison Scale (DACS) assess one's tendency to engage in upward and downward comparisons, respectively (O'Brien et al., 2009). Similarly, the Body, Eating, and Exercise Comparison Orientation Measure (BEECOM; Fitzsimmons-Craft et al., 2012) measures different comparison dimensions that tend to be associated with eating pathology. Finally, the Physical Appearance Comparison Scale (PACS; Thompson et al., 1991) is a 5-item scale that has been reported to be the most commonly used validated measure of appearance comparison (Myers & Crowther, 2009). It was revised by Schaefer & Thompson (2014), who developed the Physical Appearance Comparison Scale-Revised (PACS-R) to address the limitations of the original version, and validated the measurement in a sample of female college students. A few years later, Schaefer & Thompson (2018) developed an expanded version of the PACS-R that contains 27 items (PACS-3).

To our knowledge, only two Spanish adaptations of a physical appearance comparison instrument have been published. The first one was carried out by Alcaraz-Ibáñez et al. (2020), who adapted the PACS-R to be used in a Spanish adolescent sample. In this process, and in order to adapt the questionnaire to their target population, some vocabulary changes were conducted prior to the translation process (Alcaraz-Ibáñez et al., 2020). The second one was conducted by Senín-Calderón et al. (2020), who validated the PACS-R and the PACS-3 in a sample of young individuals from the south of Spain that were Instagram users. Hence, although these two adaptations have been published, there is a lack of evidence of the adequacy of scales measuring physical appearance comparison in wider age ranges in Spanish population.

1.2. The COVID-19 pandemic

1.2.1. The COVID-19 pandemic and its impact

In December 2019, several cases of an atypical pneumonia-like illness were found in adults within Wuhan city, in the Hubei region of China. After an initial analysis of the results of respiratory tests, experts stated that the cause of this outbreak was a novel coronavirus, which the World Health Organization (WHO) named as COVID-19, and the International Committee on Taxonomy of Viruses named as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). The virus moved swiftly from Wuhan to other Chinese cities and other countries all around the world (Siddiqui et al., 2022). On January 31, 2020, WHO's International Health Regulation Emergency Committee declared the disease outbreak a public health emergency of international concern. On March 11, 2020, after more than 118,000 cases in 114 countries and 4,291 deaths, the WHO declared COVID-19 a pandemic (Centers for Disease Control and Prevention, 2022). The rapid spread of the virus across the world resulted in several governments implementing drastic health measures, including lockdowns or "stay-at-home" orders, contact tracing, public events cancellations, public transport closures, closure of non-essential services, movement restrictions and travel restrictions (Castex et al., 2021).

In Spain, on March 14, 2020, a state of emergency was declared, placing the entire country in lockdown. All non-essential work activity was suspended, and the population was mandated to remain at home. After the initial six weeks, restrictions were gradually lifted. However, some health and social measures lasted for more than one year or are still in place at the time of writing this thesis (e.g., wearing a face mask in some indoor spaces). Several waves of coronavirus infections have been reported in Spain since the beginning of the pandemic, and according to the data provided by the Spanish Ministry of Health (Ministerio de Sanidad, 2023), a total of 13,845,825 COVID-19 cases have been notified in Spain, and 120,964 people have deceased due to the disease as of May 5, 2023.

Worldwide, over 765 million confirmed cases and over 6.9 million deaths have been reported (World Health Organization, 2023c). Hence, it is clear that the pandemic has posed a significant challenge to global health. As of time of writing, the pandemic is still ongoing even though the number of deaths has decreased significantly throughout the last year (World Health Organization, 2023c, 2023b) and restrictions have been gradually lifted all over the world (World Health Organization, 2023d).

Since the outbreak of the pandemic, several researchers and clinicians have expressed concern about its impact on mental health (Otu et al., 2020; World Health Organization - Regional Office for Europe, 2022). Thousands of studies have been published aiming to determine the mental health consequences of the pandemic. It has been suggested that the pandemic increased the prevalence of mental health problems such as depression, anxiety, distress and insomnia (Wu et al., 2021), and COVID-19 quarantines or lockdowns had varying impacts on anxiety, depression and psychological stress (Jin et al., 2021), suggesting that the psychological impact of COVID-19 lockdowns is highly heterogeneous (Prati & Mancini, 2021). Among other aspects, the pandemic has also been associated with worsening of psychiatric symptoms in patients with pre-existing psychiatric disorders, increased depressive symptoms, anxiety, psychological distress and poor sleep quality among health care workers, and with higher rates of trauma-associated symptoms in the general population (Kaubisch et al., 2022; Vindegaard & Benros, 2020).

However, these results should be cautiously interpreted as there are numerous methodological differences across studies.

1.2.2. Impact of the pandemic on body image and disordered eating

Several authors have highlighted the potential impact of the COVID-19 pandemic and its associated lockdown on the development or exacerbation of body image disturbances and eating disorders psychopathology.

Schneider et al. (2023) recently conducted a systematic review of the experiences of body image, disordered eating, and eating disorders during the COVID-19 pandemic. Other systematic reviews and meta-analyses with similar aims have been carried out within the field since the pandemic started (Devoe et al., 2023; Gao et al., 2022; Goicochea et al., 2022; Haghshomar et al., 2022; Linardon et al., 2021; McLean et al., 2022; Miniati et al., 2021; Monteleone, Cascino, et al., 2021; Sideli et al., 2021).

In their review, Schneider et al. (2023) summarised the findings in this field and included a higher number of studies compared to other reviews previously published. However, it should be noted that Schneider et al.'s review, together with the vast majority of literature that examines the impact of the pandemic on body image, was not published yet when the studies that conform this thesis were conducted. In fact, the review itself, and some of the articles that will be mentioned hereinafter, cited some of this thesis's papers, therefore their work partly built on this thesis's findings. When the articles included in this thesis were conducted, very few empirical studies had been published tackling the impact of the pandemic on body image. Hence, the new findings that are included in the following paragraphs will be further discussed in the Discussion chapter, contextualizing them with this thesis's findings.

In general terms, the literature suggests that the COVID-19 pandemic has had a negative influence on body image and disordered eating. Regarding body image, increased shape and weight concerns, drive for thinness/muscularity, body and appearance dissatisfaction, and decreased self-esteem have been reported (e.g., Robertson et al., 2021; Schlegl, Maier, et al., 2020; Schneider et

al., 2023; Swami et al., 2021; Vall-Roqué et al., 2021a, 2021b; White, 2021). Worsened disordered eating behaviours (i.e., binge eating, dietary restriction and compulsive exercise) have also been reported (Corno et al., 2022; Scharmer et al., 2020; Schneider et al., 2023; Termorshuizen et al., 2020; Zhou & Wade, 2021). Moreover, it has been suggested that specific and general symptomatology and mental health outcomes worsened in individuals living with eating disorders (Devoe et al., 2023; Schneider et al., 2023).

In contrast, some studies have reported positive outcomes of the pandemic, such as a reduction in eating disorder symptomatology, more time to reflect on recovery and engage in self-care, greater motivation to recover, and more time to connect with family (McCombie et al., 2020; Schlegl, Maier, et al., 2020; Schneider et al., 2023; Termorshuizen et al., 2020; Zeiler et al., 2021). As Schneider et al. (2023) discuss, these positive outcomes might be related with the socioeconomic status of participants, reflecting that those with higher social privilege have incurred fewer financial pressures, and this might have facilitated engagement with self-care, recovery strategies, and social support.

According to Rodgers et al. (2020), a pathway by which the current pandemic could have increased eating disorders risk and symptoms could be through an increased consumption of media (particularly social media) due to social distancing measures. This would have happened through increased exposure to harmful eating and appearance-related content, as well as more general stressful or traumatic world events.

Several factors have been identified to contribute to worse outcomes during the pandemic. These include psychological distress, comorbidity, poor coping and emotion regulation strategies, female gender, increased time spent online, longer periods of social isolation and confinement, higher BMI, and higher body dissatisfaction and eating concerns before the pandemic (Baenas et al., 2020; Castellini et al., 2020; Coulthard et al., 2021; Haddad et al., 2020). In contrast, the following factors have been associated with better outcomes during the pandemic: adaptive coping mechanisms and emotion regulation strategies, social support, taking part in enjoyable activities, and maintaining daily routines (Baenas et al., 2020; Branley-Bell & Talbot, 2020; Giel et al., 2021; Schlegl, Maier, et al., 2020; Schlegl, Meule, et al., 2020; Schneider et al., 2023).

Most of the studies that have been published within this field during the last few years had a cross-sectional design, and several of them included samples of individuals with eating disorders instead of general population, therefore further research is still needed in order to disentangle the impact of the pandemic on body image disturbance and disordered eating.

1.2.3. Impact of the pandemic on SNSs use

The COVID-19 pandemic has led to many changes worldwide. Among other aspects, several governments imposed quarantine and lockdown measures on their populations, which led to a drastic reduction in interpersonal interactions. To alleviate the negative experiences of social distancing measures and social isolation, people spent more time online (Marciano et al., 2022).

This section aims to summarise the main findings that have been published regarding the impact of the pandemic on SNSs. As mentioned in the previous section, it should be noted that most of the literature that is included in the following paragraphs was not published when the studies of this thesis took place, and several articles cited this thesis's findings. Hence, it will be further discussed in the Discussion chapter in light of this thesis's findings.

Unsurprisingly, the pandemic (especially the lockdown phase) has been associated with an increase in the use of SNSs, with TikTok being the one with the greatest increase, particularly among adolescents and young adults (Cellini et al., 2020; Marciano et al., 2022; Pérez-Escoda et al., 2020; Rosen et al., 2022; Statista, 2023). Fumagalli et al. (2021) indicated that social media use increased at the beginning of the lockdown (March-April 2020), and Arend et al. (2021) found that more than 40% of their participants increased their daily time spent using social media.

As Hamilton et al. (2022) discuss, COVID-19 has probably magnified existing challenges and opportunities of social media use for individuals' wellbeing. While some studies have highlighted the positive side of using social media during the pandemic, others have concluded that SNSs use was associated with diminished well-being (Marciano et al., 2022). For example, Iqbal et al.

(2022) reported that excessive SNSs use during the pandemic was associated with depression, loneliness and social anxiety. Bellapigna et al. (2023), in turn, indicated that lacking structure, increased loneliness, negative concerns about body image and frequent social media use in the context of the pandemic were associated with increased social anxiety, depressive symptoms, and disordered eating symptoms. Masciantonio et al. (2021) concluded that the differences among SNSs should be considered as each SNS (and whether it was actively or passively used) had a different impact on psychological wellbeing during the pandemic.

Moreover, social media content specific to the COVID-19 pandemic emerged during the lockdown period, which often showcased low-weight individuals, appearance preoccupation and comparisons, and weight-normative assumptions, and promoted the diet culture and weight stigmatizing messages (Lucibello et al., 2021; Pearl, 2020). As mentioned previously in this thesis, being exposed to this kind of content is usually associated with body image disturbance (Faelens et al., 2021; Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Ryding & Kuss, 2020; Silva et al., 2020; Vandenbosch et al., 2022). Other content, in contrast, aimed to encourage acceptance and self-care, and included images or videos promoting body and appearance acceptance. Parcell et al. (2023) reported that exposure to body positive content was associated with improved body image and mood as compared to exposure to diet culture content.

In conclusion, an increased use of SNSs during the pandemic might have had an impact on body image and other psychological aspects, even though each SNS should probably be examined separately, and other specific aspects such as the type of SNSs use (e.g., appearance-focused or not) should be considered. Moreover, it must be noted that very few longitudinal studies have been published within this area, and many articles refer to social media instead of SNSs, therefore they include other platforms such as instant messaging platforms (e.g., Whatsapp, Telegram), that might have impacted people's mental health and body image in a different manner during the pandemic.

1.2.4. Sex and gender considerations

Even though the COVID-19 pandemic has affected all of us, it has been claimed that it has had a higher negative impact on women, contributing to increased gender inequality (e.g., Flor et al., 2022). In order to design effective interventions and policies, it is crucial to identify the differential impacts of the pandemic across categories of sex (the biological and physiological categorisation of an individual as female, male or intersex) and gender (a social construct that captures the characteristics of women, men, girls and boys that are socially constructed) (World Health Organization, 2023a).

Some studies have focused on indicators directly related to COVID-19 and have found sex differences in death rates and symptoms severity, with males having more severe symptoms and higher mortality than females (Roth et al., 2021; Takahashi et al., 2020). Others have examined how gender inequalities have been affected by the indirect social and economic effects of the pandemic worldwide. Flor et al. (2022) concluded in their comprehensive review that women have been hit much harder socially and economically than men: they were more likely to report employment loss, as well as forgoing work to care for others. Also, girls and women were more likely than boys and men to drop out of school for reasons other than school closures, and to report that gender-based violence had increased during the pandemic. These results suggest that pre-existing widespread inequalities between women and men intensified during the COVID-19 pandemic (Flor et al., 2022).

With regards to mental health, several studies have found that women were more likely to report adverse mental health outcomes (e.g., depression, anxiety, stress) than men across all populations during the pandemic (Gibson et al., 2021). In their systematic review on the impact of inequality on mental health outcomes during the pandemic, Gibson et al. (2021) also indicated that nonbinary and transgender participants had high levels of mental health symptoms (Alonzi et al., 2020; Liu et al., 2020). However, it should be noted that most pandemic research has been conducted with predominantly cisgender participants (Mikhail, 2023), and several studies used “sex” and “gender” interchangeably and did not specify whether they were assessing sex, gender, or gender identity.

In relation to body image and disordered eating, Schneider et al. (2023) indicated in their recent systematic review that self-identifying as a woman was a factor associated with worse outcomes during the pandemic. They concluded that pandemic-related stress was associated with eating disorder symptoms and perceived weight gain, and this association was stronger in women and individuals who identified as LGBTQ+ compared to cisgender and heterosexual men. In contrast, some studies also included in the review reported no effect of gender on body image or eating outcomes during COVID-19 (Kim et al., 2022; Puhl et al., 2020; Schneider et al., 2023).

1.2.5. Age considerations

Adolescence and young adulthood are developmental periods characterised by transitions and have often been linked with many challenges regarding mental health and wellbeing. Therefore, it is not surprising that some scholars have expressed concerns about the impact of the COVID-19 pandemic on youth mental health since the initial stages of the pandemic (e.g., Wang et al., 2020).

The majority of studies included in Gibson et al.'s (2021) systematic review suggested that younger age (i.e., being less than 35 years old) was associated with detrimental mental health outcomes of the pandemic, despite there were a few studies showing worse outcomes in middle or older age or reporting no differences in mental health based on age. Other articles have described similar findings, indicating that younger people (children, adolescents and/or emerging adults) were more vulnerable to or exhibited higher prevalence rates of stress, depression and anxiety symptoms, irritability, anger, sleep problems, self-harm behaviours and suicidal ideation during the pandemic (Dragioti et al., 2022; Nearchou et al., 2020; Panchal et al., 2021; Racine et al., 2021; Varma et al., 2021).

Findings are inconclusive regarding the effect of age on body image or disordered eating during the pandemic (Schneider et al., 2023). In this regard, some studies show younger age to be a risk factor and older age to be a protective factor (e.g., Ramalho et al., 2022), one study concludes that adolescents had a more pronounced reactivation of eating disorder

symptoms than children (Graell et al., 2020), and one study found no influence of age on the changes in eating disorder symptomatology and general psychopathology in people with an eating disorder during the pandemic (Monteleone et al., 2021).

1.3. Gaps in the literature that this research sought to address

The studies within this thesis took place because some specific gaps were identified in the literature. These are explained below.

First of all, when this thesis started, there was a lack of a Spanish validation of a physical appearance comparison questionnaire applied to a wide Spanish community sample. As mentioned in the section *'The role of appearance comparisons*', two studies had been recently published adapting the PACS-R to Spanish populations (Alcaraz-Ibáñez et al., 2020; Senín-Calderón et al., 2020). However, they focused on specific samples: in one case (Alcaraz-Ibáñez et al., 2020), some vocabulary changes were conducted prior to the translation process in order to target the questionnaire to an adolescent sample, and in the other case (Senín-Calderón et al., 2020), the sample consisted of young individuals from the south of Spain that were Instagram users. This is why Study 1 was conducted.

Then, the pandemic happened. When the first pandemic-related study of this thesis (Study 2) was conducted, articles examining the mental health consequences of the pandemic were starting to circulate (mainly cross-sectional research examining the level of anxiety, depression, and stress of the population during the first wave of the pandemic). However, only a small number of articles had been published examining self-esteem or eating disorder risk in Spanish samples during the first months of the pandemic. Also, most of the studies published in that moment did not assess the relationship between sociodemographic or COVID-19/lockdown-related variables (e.g., place of residence, relationship status, employment status, COVID-19 infection, loss of a significant person due to COVID-19, having a place to relax at home or not) and psychological outcomes.

Furthermore, when Study 2 took place, it had already been suggested by some authors that women and young individuals were two of the most vulnerable groups to the negative psychosocial effects of the pandemic (see sections 1.2.4 and 1.2.5). However, to our knowledge, no studies had addressed women's perceived changes in different life areas (e.g., eating habits, appearance concerns, physical activity, sleep, self-caring time, alcohol consumption, family relationships, etc.) during the first months of the pandemic. Moreover, there was a lack of scientific articles considering the multivariate effect of psychological wellbeing during lockdown on disordered eating symptoms and anxiety, stress, and depressive symptoms.

When the second pandemic-related study of this thesis (Study 3) was conducted, despite it was known that younger age was associated with detrimental mental health outcomes of the pandemic, few studies had considered the differences across different age groups within samples of adolescent and young individuals. Moreover, there was a lack of scientific studies examining how SNSs were being used during the pandemic (e.g., whether individuals were using SNSs more frequently or in an appearance-focused manner).

Also, even though the relationship between SNSs use (especially an appearance-focused use) and body dissatisfaction was already well-established (see section 1.1.3), no studies had assessed this relationship yet during the pandemic.

Finally, no longitudinal studies had been published examining the changes in body image disturbance, appearance comparisons, or Instagram use throughout the pandemic when this thesis was conducted. In this regard, to our knowledge, it had not been longitudinally assessed whether the pandemic had been associated with an appearance-focused use of SNSs. These are the main reasons why Study 4 was carried out. Moreover, very few scientific articles that aimed to longitudinally examine the changes in psychological variables throughout the pandemic included pre-pandemic data. In our study, our pre-pandemic data came from the PACS-R validation study (Study 1), which was conducted a few months before the pandemic

outbreak: in Study 1, several women provided their email address to be contacted later if necessary.

Considering that an appearance-focused SNSs use is linked to body dissatisfaction (e.g., Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Sherlock & Wagstaff, 2019), an increase in the (appearance-focused) use of SNSs during the pandemic could have led to an increase in body dissatisfaction. Furthermore, taking into consideration that appearance comparisons play a mediating role in the link between SNSs use and body image disturbance (e.g., Fardouly et al., 2018; Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Perloff, 2014; Ryding & Kuss, 2020; Saiphoo & Vahedi, 2019; Silva et al., 2020), an increase in SNSs use throughout the pandemic could be related to an increase in (media-related) appearance comparisons, which could lead to increased body image disturbance. Considering that during the lockdown period people were presumably not engaging in socialising and could not compare themselves in-person with their peers, they might have increased their comparisons on SNSs, and it is known that social media comparisons tend to be focused on the beauty ideal and can be particularly harmful (Fardouly et al., 2017), which might have led to increased body dissatisfaction. To our knowledge, these aspects were gaps in the literature that had not been addressed yet when Study 3 and Study 4 took place.

As Saiphoo & Vahedi (2019) discuss, SNSs use has traditionally been measured as time spent on SNSs or total exposure to SNSs, which could include a wide range of behaviours when using SNSs and might not be comprehensive enough in understanding body image behaviours when a person uses SNSs, therefore research should attempt to separate appearance-focused and non-appearance focused use of SNSs to tease apart their potentially separate relationships with body image disturbance. That is the reason why Study 3 and Study 4 specifically differentiated appearance-focused versus non-appearance-focused Instagram use.

Also, as indicated by several academics in the field of body image (e.g., Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Ryding & Kuss, 2020), research in this area has focused on Facebook for many years, and it should

investigate more image-based SNSs, such as Instagram or Tiktok, in order to test their impact on appearance comparisons and body image disturbance. That is why Instagram use was specifically examined in Studies 3 and 4, and Tiktok use was assessed in Study 3.

Moreover, some empirical or review articles in the field of SNSs and body image refer to 'social media' instead of SNSs, which is an umbrella term that often includes a variety of online platforms (see section 1.1.2). This might lead to confusion when interpreting the results of these studies, as the effects of SNSs use are different from the effects of using other platforms such as instant messaging platforms (Sarman & Tuncay, 2023). Hence, this is another reason for focusing on specific SNSs in Studies 3 and 4.

Finally, as it has been previously mentioned, it should be considered that research investigating the effects of the COVID-19 pandemic on body image disturbance and eating disturbances is growing rapidly. Hence, some of the gaps in the literature that were addressed with this thesis have been gradually studied during the last few years, partly building on this thesis' findings.

AIMS

2. Aims

2.1. General aims

Taking into account the gaps in the literature mentioned in the previous section, the main aims of this thesis were the following ones: (1) to validate a scale for assessing physical appearance comparisons in Spanish populations, (2) to examine the levels of distress, disordered eating and body image disturbance during the first months of the pandemic, (3) to explore changes in SNSs use, body image and appearance comparisons during the pandemic, and (4) to examine the relationship between SNSs use (and its changes throughout the pandemic) and body image disturbance and low self-esteem.

A cross-cutting aim within this thesis was to focus on younger age groups and women. As it has been explained in the Introduction chapter, these have been two of the most vulnerable collectives to the effects of the pandemic, and both body dissatisfaction and an increased appearance-focused use of SNSs are more prevalent among younger people and women than in other population groups. Hence, Studies 3 and 4 included women only, and some parts of Study 2 were highly focused on women. In turn, Study 2 and Study 3 included adolescents and young people only.

2.2. Specific objectives

At a more specific level, the objectives of this thesis were the following ones: (1) to validate the PACS-R in a Spanish sample (Study 1), (2) to examine the levels of depression, anxiety, stress, self-esteem, disordered eating, body dissatisfaction and drive for thinness during the first months of the pandemic (Studies 2 and 3), (3) to explore the changes in SNSs use (especially Instagram), body dissatisfaction and appearance comparisons during the pandemic (Studies 3 and 4), (4) to determine whether SNSs use was associated with body image disturbance and low self-esteem during the initial months of the pandemic (Study 3), and (5) to explore whether there was a relationship between the changes in Instagram use throughout the pandemic and body dissatisfaction and appearance comparisons (Study 4).

The first study of this thesis aimed to validate the PACS-R in a Spanish mixed-gender community sample. Its specific objectives were the following ones:

- To test the questionnaire's internal structure.
- To analyse the questionnaire's reliability in terms of internal consistency and test-retest.
- To assess the questionnaire's convergent validity with regard to body dissatisfaction, eating disturbances, appearance-related sociocultural pressures, social comparison and self-esteem.
- To test the questionnaire's predictive utility by examining the measure's ability to predict scores on theorized outcome variables (i.e., body dissatisfaction and eating disturbances), over and above measures of sociocultural influence and BMI.

The main objective of Study 2 was to determine the psychological status of a community sample of Spanish adolescents and young people during the first months of the pandemic, in terms of depression, anxiety, stress, self-esteem, and disordered eating, and to examine women's perceived changes in some life areas since the pandemic outbreak. More specifically, Study 2 had the following objectives:

- To determine the levels of depression, anxiety, stress, self-esteem, and disordered eating (dieting, bulimia and food preoccupation, and oral control) in a community sample of Spanish adolescents and young people during the first months of the pandemic.
- To assess the relationship between sociodemographic or COVID-19/lockdown-related variables (e.g., gender, place of residence, relationship status, employment status, COVID-19 infection, loss of a significant person due to COVID-19, having a place to relax at home or not) and psychological outcomes.
- To examine women's perceived changes in different life areas (eating habits, physical activity, sleep, self-caring time, alcohol, tobacco and other drugs consumption, family, friends, couple and sexual relationships, appearance concerns, health concerns, concerns about one's future, anxiety, feelings of sadness, feelings of

loneliness, feeling of autonomy) during the first months of the pandemic (lockdown period).

- To examine the multivariate effect of psychological wellbeing during lockdown on disordered eating symptoms and anxiety, stress, and depressive symptoms.

The third study aimed to examine the levels of body dissatisfaction, drive for thinness, self-esteem and SNSs use during the initial months of the pandemic, and to explore whether SNSs use was associated with body image disturbance and low self-esteem in adolescent and young women. Its specific objectives are listed below:

- To determine the levels of self-esteem, body dissatisfaction and drive for thinness in a community sample of Spanish adolescent and young women during the first months of the pandemic.
- To explore whether there were differences between age groups in the frequency of use of SNSs (Instagram, Youtube, TikTok, Twitter and Facebook) and in the proportion of women following appearance-focused accounts on Instagram in the pandemic context.
- To determine whether there were changes in the frequency of SNSs use and in the type of accounts followed on Instagram (appearance-focused vs. non-appearance-focused) before and during lockdown.
- To examine whether there was a statistically significant relationship between the use of Instagram (in terms of frequency of use and appearance-focused use or not) and self-esteem, body dissatisfaction and drive for thinness in the pandemic context.
- To determine whether SNSs use could act as a predictor of drive for thinness in the pandemic context.

Finally, Study 4 was conducted with the main objective of determining the evolution of Instagram use, body dissatisfaction and appearance comparisons throughout the pandemic in a women sample. It had two specific objectives:

- To longitudinally explore changes in Instagram use (in terms of frequency of use and appearance-focused use or not), body dissatisfaction and physical appearance comparisons throughout the pandemic (in four time points, with the first one being two months

before the pandemic started), both in the whole women sample and in two subgroups: those at risk of having an eating disorder and those without eating disorder risk.

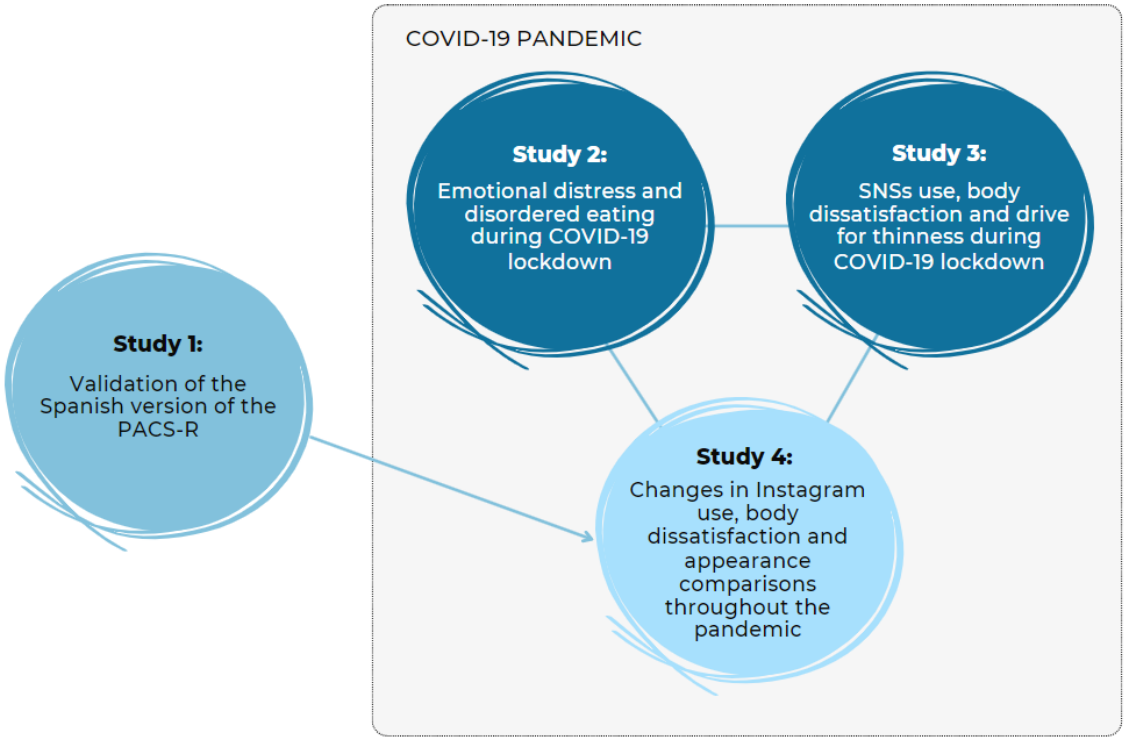
- To determine whether there was a relationship between the changes in Instagram use throughout the pandemic and body dissatisfaction and appearance comparisons.

STUDIES

3. Studies

This thesis is composed by four studies, which are visually represented in Figure 4. As explained before, Study 1 (PACS-R validation in a Spanish sample) was conducted a few months before the pandemic outbreak. The validated Spanish version of the PACS-R was intended to be used in a study where the role of appearance comparison in the relationship between appearance-focused use of SNSs and body image disturbance would be explored in depth. However, considering the profound impact that the pandemic was having on everybody's lives, and potentially on eating patterns and body image, the objectives of this thesis were re-assessed, and we decided to focus on the pandemic impact.

Figure 4. Visual representation of the studies that form this thesis.



Note. PACS-R: Physical Appearance Comparison Scale-Revised.

As several participants of Study 1 had provided their emails in the survey for the test-retest and to be contacted again if necessary, we sent them an email inviting them to take part in a longitudinal study that would examine the changes in appearance comparisons and body image-related variables throughout the pandemic, using their data collected for Study 1 as pre-pandemic "baseline" data. Hence, Study 1 allowed us to conduct Study 4, which lasted for 19 months and involved four measurement points (pre-pandemic and 2, 9 and 15 months after the pandemic outbreak in Spain).

Studies 2 and 3 were conducted two months after the pandemic outbreak in Spain and had a cross-sectional design. We first conducted Study 2 aiming to gain a broad understanding of the psychological status of a community sample of Spanish adolescents and young people during the first months of the pandemic, in terms of depression, anxiety, stress, self-esteem, and disordered eating, and to examine women's perceived changes in some life areas since the pandemic outbreak. After observing the "big picture", Study 3 was conceived with narrower objectives in mind: we aimed to delve into the levels of body dissatisfaction, drive for thinness, self-esteem and SNSs use (including different platforms) during the initial months of the pandemic, and to explore whether SNSs use (especially an appearance-focused use) was associated with body image disturbance and low self-esteem in adolescent and young women.

Hence, while longitudinal data for Study 4 was being collected approximately every 6 months, Studies 2 and 3 were carried out. The findings from Studies 2 and 3 were very helpful to conceptualize the results of Study 4.

Finally, it should be noted that approval to conduct all the studies was granted by the Bioethics Committee of the University of Barcelona (IRB00003099; see Appendix 1).

The four studies are presented in the next sections. Each of them was published as a scientific article in a peer-reviewed international journal, and their content is presented below as it was published. Studies 1 and 2 were published both in English and in Spanish aiming to reach a broader (Spanish-speaking) audience. A Spanish abstract of each study can be found in Appendix 2.

STUDY 1

3.1. Study 1: Validation of the Spanish version of the Physical Appearance Comparison Scale-Revised (PACS-R)

Published as:

Vall-Roqué, H., Andrés, A., & Saldaña, C. (2022). Validation of the Spanish version of the Physical Appearance Comparison Scale-Revised (PACS-R): Psychometric properties in a mixed-gender community sample. *Behavioral Psychology/Psicología Conductual, 30*(1), 269-289. https://doi.org/10.51668/bp.8322114n

Vall-Roqué, H., Andrés, A., & Saldaña, C. (2022). Validación española de la "Escala de Comparación de la Apariencia Física" (PACS-R): Propiedades psicométricas en una muestra comunitaria de hombres y mujeres. *Behavioral Psychology/Psicología Conductual, 30*(1), 269-289. https://doi.org/10.51668/bp.8322114s

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Validation of the Spanish version of the Physical Appearance Comparison Scale-Revised (PACS-R): Psychometric properties in a mixed-gender community sample

Helena Vall-Roqué[1], Ana Andrés[2] & Carmina Saldaña[1]

[1] Department of Clinical Psychology and Psychobiology, Faculty of Psychology, Universitat de Barcelona, Barcelona, Spain.

[2] Faculty of Psychology, Education Sciences and Sport, Ramon Llull University, Barcelona, Spain.

Corresponding author: Helena Vall-Roqué. Department of Clinical Psychology and Psychobiology, Faculty of Psychology, Universitat de Barcelona, Passeig Vall d'Hebron, 171, 08035 Barcelona, Spain.

Abstract

The objectives of this study were to examine the validity and reliability of the Spanish version of the Physical Appearance Comparison Scale-Revised (PACS-R) and to assess its ability to predict body dissatisfaction and disordered eating in a community sample in Spain. A total of 1405 participants (83.6% women; aged 14-64) completed the Spanish PACS-R along with measures of body image, eating disturbances, appearance-related sociocultural influences, self-esteem, and social comparison. Exploratory and confirmatory factor analyses supported the original one-dimensional factor structure for the 11-item Spanish version of the PACS-R. Women had significantly higher PACS-R scores than men. Internal consistency of the measure was excellent, and results showed good test-retest reliability and convergent validity in men and women. Regression analyses demonstrated the utility of the scale in predicting body dissatisfaction and disordered eating in both genders. Results suggest that the Spanish PACS-R has excellent psychometric properties, therefore it might be a useful tool to measure appearance comparisons among Spanish speaking populations.

Keywords

PACS-R, appearance comparison, body image, measurement, Spanish validation, psychometric properties.

INTRODUCTION

Festinger's social comparison theory posits that people tend to search out standards to which they can compare themselves as a means to determine their own progress and standing in life (Festinger, 1954). It has been suggested that this theoretical framework might be useful to understand not only comparisons related to abilities and opinions, but also physical appearance comparisons, as there is a large drive to compare oneself to group norms in the case of body image (Strahan et al., 2006; Taniguchi & Ebesu Hubbard, 2019). Taking into consideration that Western societies promote beauty ideals that are unrealistic and unattainable for a great part of the population, people are likely to experience body dissatisfaction when they compare their bodies to the standards of physical attractiveness (Wasilenko et al., 2007).

According to the tripartite influence model (Thompson, Heinberg, et al., 1999), appearance comparisons and internalization of appearance ideals act as mediating variables for the relationship between sociocultural pressures, body dissatisfaction and eating disturbances. Several studies have indicated the role of appearance social comparison as a cognitive process that mediates the relationship between sociocultural factors and body dissatisfaction (Strahan et al., 2006; van den Berg & Thompson, 2007; Want, 2009), and the tendency to engage in appearance comparisons has been consistently associated with a negative body image (Fardouly et al., 2015b; Keery et al., 2004; Myers & Crowther, 2009) and eating disorders (Alcaraz-Ibáñez, 2017; Thompson, Coovert, et al., 1999). Even though the aetiology of eating disorders is complex and multiple models have been suggested (Moreno-Encinas et al., 2021), appearance comparisons might play a key role in the development of eating disturbances.

Furthermore, research has demonstrated significant relationships between appearance comparisons and a number of psychosocial variables, such as negative affect, low self-esteem, self-objectification, body surveillance, body shame, drive for thinness and internalization of thin ideals (Davison & McCabe, 2005; Engel et al., 2013; Fardouly et al., 2015a; Ridolfi et al., 2011; Tiggemann & Miller, 2010; Tylka & Sabik, 2010).

While the association between appearance comparison tendency and body dissatisfaction has been consistently demonstrated in women, the findings are less consistent in men. For example, Halliwell & Harvey (2006) found that there was a significant correlation between peer comparison tendency and body dissatisfaction both in males and females, but Humphreys & Paxton (2004) reported that the association was not significant among boys. Furthermore, the literature suggests that females tend to focus on their weight when they compare themselves, while males' comparisons are often related to muscularity (Fisher et al., 2002). Also, men seem to engage in fewer appearance comparisons compared to women, and the effect of these comparisons might be less associated with negative feelings about their body (Carlson Jones, 2004; Davison & McCabe, 2005, 2006; Myers & Crowther, 2009). It has been suggested that inconsistent findings among men could be due to the measures used, as most of the commonly used body dissatisfaction and disordered eating measures have been developed and validated in female samples. Therefore, differences across genders might be influenced by instrument bias (Darcy & Lin, 2012).

Given the importance of appearance comparisons in the context of body image and eating disturbances, it is essential to have a measure to adequately assess one's tendency to engage in physical appearance comparisons. In this sense, some scales have been developed. For example, the Body Comparison Scale (BCS; Thompson, Heinberg, et al., 1999) measures the frequency in which a person compares specific body sites to those of other individuals, and the Upward Physical Appearance Comparison Scale (UPCS) and Downward Appearance Comparison Scale (DACS) assess one's tendency to engage in upward and downward comparisons, respectively (O'Brien et al., 2009). Similarly, the Body, Eating, and Exercise Comparison Orientation Measure (BEECOM; Fitzsimmons-Craft et al., 2012) measures different comparison dimensions that tend to be associated with eating pathology. Finally, the Physical Appearance Comparison Scale (PACS; Thompson et al., 1991) is a 5-item scale that has been reported to be the most commonly used validated measure of appearance comparison (Myers & Crowther, 2009). It was revised by Schaefer & Thompson (2014), who created the Physical Appearance Comparison Scale-Revised (PACS-R) to address the limitations of the original

version, and validated the measurement in a sample of female college students. Recently, Schaefer and Thompson (2018) developed an expanded version of the PACS-R that contains 27 items (PACS-3).

To our knowledge, only two Spanish adaptations of a physical appearance comparison instrument have been published. The first one was recently conducted by Alcaraz-Ibáñez et al. (2020), who adapted the PACS-R to be used in a Spanish adolescent sample. In this process, and in order to adapt the questionnaire to their target population, some vocabulary changes were conducted prior to the translation process (Alcaraz-Ibáñez et al., 2020). The second one was recently conducted by Senín-Calderón et al. (2020), who validated the PACS-R and the PACS-3 in a sample of young individuals from the south of Spain that were users of the social network Instagram. However, there is a lack of evidence of the adequacy of scales measuring physical appearance comparison in wider age ranges in Spanish population.

The main objective of the present study was to validate the PACS-R in a Spanish mixed-gender community sample. The specific aims were: a) to test its internal structure, b) to analyse its reliability in terms of internal consistency and test-retest, c) to assess its convergent validity with regard to body dissatisfaction, eating disturbances, appearance-related sociocultural pressures, social comparison tendency and self-esteem, and d) to test its predictive utility by examining the measure's ability to predict scores on theorized outcome variables (i.e., body dissatisfaction and eating disturbances), over and above measures of sociocultural influence and body mass index (BMI). We hypothesized that the internal structure of PACS-R in its Spanish version would show a single-factor structure and would have adequate indices on internal consistency and stability. We also theorised that the PACS-R would be positively correlated with measures of body dissatisfaction, eating pathology, social comparison tendency, internalization of appearance ideals, and appearance-related sociocultural pressures, and that it would be negatively correlated with measures of self-esteem and self-assessed attractiveness. Finally, we hypothesized that the questionnaire would be able to adequately predict body dissatisfaction and disordered eating.

METHOD

Participants

A total of 2,439 participants from a community sample participated in the present study. Participants that did not live in Spain, those who presented uncompleted data, and those who were older than 65 years old or younger than 14 years old (n= 1,034) were excluded from the analyses, yielding the final sample of 1405 participants.

1,175 participants were women (83.6%), 220 were men (15.7%), and 10 identified themselves as nonbinary (0.7%). Participants ranged in age from 14 to 64, with a mean age of 26.49 years (SD= 11.52). Mean sample BMI was 22.93 kg/m2 (SD= 4.43). Regarding the educational level, most of the participants had completed secondary (48.3%) and higher (42%) education. Furthermore, 44.5% of the sample did not have any income, 19.8% had an average income below the minimum wage (MW), 23.7% had an average income that ranged between 1 and 2 times the MW, and 12% had an income of 3 times or more the MW. Finally, 51.7% of the sample reported to be single, 31.5 % were in a stable partnership, 14.5% were married or in a civil partnership, and 2.3% were separated, divorced or widowed.

Instruments

a) *Ad hoc Sociodemographic Questionnaire*. Participants self-reported their age, gender, place of residence, educational level, average income, civil status, height and weight. Height and weight measures were used to calculate BMI.

b) *Physical Appearance Comparison Scale-Revised* (PACS-R; Schaefer & Thompson, 2014). The PACS-R is an 11-item questionnaire that measures the tendency to compare one's physical appearance to others in a broad array of social settings. Responses are rated on a 5-point Likert-type scale ranging from "Never" to "Always". Higher scores indicate higher levels of general appearance comparison. Psychometric evaluations of the original English version of the PACS-R indicate that the questionnaire has a single factor structure, and excellent internal

consistency (Cronbach's alpha of .97) and convergent validity with measures of body satisfaction, eating pathology, sociocultural influences on appearance, and self-esteem in college females (Schaefer & Thompson, 2014). For the present study, the PACS-R was backtranslated into Spanish according to Beaton et al. (2000). First, the PACS-R was translated into Spanish by a psychologist highly proficient in English. In order to ensure the "experiential" and "conceptual" equivalence of words as indicated by Beaton et al. (2020), special attention was paid to the word 'gym' (Item 11), as the sample included underage individuals. Since 14-year-old individuals are allowed to go to the gym in Spain and it is common for them to do so, the term 'gym' was kept in the Spanish translation. Second, a back translation in English was performed by a second independent translator to ensure item contents reflected those of the original English version. One of the authors of the original PACS-R English version reviewed the back-translation and reported it to be accurate.

c) *Multidimensional Body-Self Relations Questionnaire* (MBSRQ; Cash, 1990) adapted to Spanish by Botella et al. (2009). The Self-assessed Physical Attractiveness (SPA) subscale of the Spanish version of the MBSRQ was used. It contains 3 items that measure the perceived attractiveness of one's body or appearance. Higher scores indicate higher self-assessed attractiveness. The MBSRQ has been shown to be a four-factor reliable and valid measure of body image in Spanish samples, with a Cronbach's alpha of .89 for the whole questionnaire and .84 for the SPA subscale (Botella et al., 2009).

d) *Sociocultural Attitudes Towards Appearance Questionnaire* (SATAQ-4; Schaefer et al. 2015), adapted to Spanish by Llorente et al. (2015). The SATAQ-4 is a 22-item questionnaire that measures the degree of endorsement of western cultural standards of appearance. Responses are rated on a 5-point scale from "Completely disagree" to "Completely agree". Higher scores indicate greater appearance-related sociocultural influence. Both the original and the Spanish version of the SATAQ-4 have five subscales: thin-ideal internalization, athletic-ideal internalization, family pressure, peer pressure, and media pressure to attain the ideal appearance. The five subscales were used in this study.

The SATAQ-4 has exhibited good psychometric properties in Spanish samples, with Cronbach's alphas ranging between .88 and .97 among the scales (Llorente et al., 2015).

e) *Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1965), and adapted to Spanish by Martín-Albo et al. (2007). The RSES is a widely used 10-item questionnaire that assesses global self-esteem and general feelings of self-worth with a 4-point Likert scale, ranging from "Strongly disagree" to "Strongly agree". Higher scores indicate higher self-esteem. The scale has been shown to have a one-factor structure and satisfactory levels of internal consistency (Cronbach's alpha of .85) in Spanish samples (Martín-Albo et al., 2007).

f) *Iowa-Netherlands Comparison Orientation Measure* (INCOM; Gibbons & Buunk, 1999), adapted to Spanish by Buunk et al. (2005). The INCOM assesses individual differences in social comparison orientation. The measure consists of 11 items that are rated on a 5-point Likert scale ranging from "I disagree strongly" to "I agree strongly", and higher scores indicate higher levels of social comparison. Both the original and the Spanish version have a two-factor structure (one scale related to ability-related comparisons, and the other one related to comparisons based on opinions), and the measure has good psychometric properties (Cronbach's alpha of .80) in Spanish samples (Buunk et al., 2005).

g) *Eating Disorders Inventory-3* (EDI-3; Garner, 2004), adapted to Spanish by Elosua et al. (2010). The Drive for Thinness (DT) and Body Dissatisfaction (BD) subscales were applied. The DT subscale comprises 7 items that assess the desire to be thinner, concern with dieting, preoccupation with weight and fear of weight gain. The BD subscale consists of 10 items that assess discontentment with the overall shape and with the size of those regions of the body of extraordinary concern to those with eating disorders. Responses of both subscales are rated on a 6-point Likert scale, ranging from "Never" to "Always". Both scales have an adequate internal consistency: DT has been reported to have alpha values of .92 and .64 in Spanish women and men respectively, and BD's alpha values were .90 and .67 in Spanish women and men (Elosua et al., 2010).

h) *Eating Attitudes Test-26* (EAT-26; Garner et al., 1982), adapted to Spanish by Castro et al. (1991). The EAT-26 is a 26-item self-report questionnaire that measures disordered eating behaviour and attitudes. Items are presented in a 6-point Likert scale ranging from "Never" to "Always", and higher scores indicate higher levels of eating disturbances. It has three subscales: dieting, bulimia and food preoccupation, and oral control. The questionnaire has been reported to have adequate psychometric properties, and the alpha reliability coefficient in a Spanish sample was .93 (Castro et al., 1991).

Procedure

The study was approved by the University of Barcelona's Bioethics Commission. Parental consent was not requested, as the Spanish law states that it is only required for individuals under 14 years old for this type of studies (Organic Law 3/2018 for Data Protection and guarantee of Digital Rights, articles 6 and 7).

Participants were recruited through various social media platforms (Twitter, Instagram and Facebook). Respondents to study advertisements clicked on a web link that took them to an online secure internet-based website. All participants gave their informed consent before completing questionnaire measures. Participants had the option to provide their email address and a code to be contacted one month later to fulfil the questionnaires again in order to conduct a retest. Participants did not receive compensation for their participation.

Data analyses

Descriptive and exploratory analyses and comparisons of means were performed using SPSS Version 20.0 statistical software, and AMOS 23.0 software (IBM, USA) was used for the confirmatory factor analysis (CFA).

A cross-validation was conducted. Participants were randomly assigned to two groups: sample 1 (n= 703) and sample 2 (n= 702). Means comparisons

using Student's t tests revealed no statistically significant differences between the two samples in terms of age or BMI. The chi-square test showed no statistical differences in the proportion of men and women in the two samples.

First, Kaiser-Meyer-Olkin (KMO) and Barlett's tests were used to determine if the data were appropriate for factor analysis. Kaiser (1974) indicated that KMO values in the .80-.90 range or higher are "ideal", and values greater than .70 are adequate or "middling". An exploratory factor analysis (EFA) using principal axis factoring and Promax oblique rotation was conducted to data obtained from sample 1. The following strategies were used in order to determine the number of underlying factors: eigenvalues equal to or greater than 1.0 (Guttman, 1954; Kaiser, 1960), examination of the scree plot (Cattell, 1966), and Horn's parallel analysis (Horn, 1965; Zwick & Velicer, 1986). The items' factor loadings were calculated, and they were deemed to be acceptable if they reached .30 (Floyd & Widaman, 1995).

Second, the factor structure of the questionnaire was confirmed with a CFA that was applied to sample 2. Prior to conducting the CFA, the multivariate normality assumption was tested by calculating Mardia's estimate for multivariate kurtosis (Mardia, 1970). Values above 5.0 for Mardia's normalised estimate are indicative of non-normal data (Bentler, 2005). Since the data were found to be multivariate non-normal, the unweighted least square (ULS) estimation method was applied, and the following goodness-of-fit indices were obtained: goodness-of-fit index (GFI), normed fit index (NFI), comparative fit index (CFI), standardised root mean square residual (SRMR) and root mean square error of approximation (RMSEA). The cut-off values to determine a good model fit were the following ones: equal or higher than .95 for CFI (Hu & Bentler, 1999), equal or higher than .90 for GFI and NFI (Jackson et al., 2009), and equal or lower than .05 for SRMR (Hu & Bentler, 1999). For the RMSEA, values of .05 and lower are considered to represent good fit, values from .05 to .08 represent acceptable fit, and values from .08 to .10 represent marginal fit (Browne & Cudeck, 1993).

Third, a reliability analysis was conducted in samples 1 and 2 for men and women separately, by means of Cronbach's alpha and McDonald's omega.

Item discrimination was assessed via the corrected item-total correlations, applying the criteria of Nunnally and Bernstein (1994). The average PACS-R score was calculated separately for men and women of the whole sample, and an independent-samples t-test was conducted to determine whether there were significant differences in the PACS-R score between genders. It should be noted that nonbinary participants (n= 10) were not included in the analyses that were performed separately for men and women or that assessed differences between genders, due to the small sample size of individuals who reported identifying themselves as nonbinary. The effect size was assessed by Hedges' g and 95% confidence interval, and it was interpreted according to Cohen's criteria (Cohen, 1988). Moreover, the one-month test-retest reliability of the PACS-R scores was examined in a subset of the overall sample (n= 165; 80% women) via intraclass correlation coefficients. Correlations of .70 or higher indicate good test-retest reliability (Crocker & Algina, 2008).

Fourth, Pearson's correlations were used in men and women from the whole sample separately to assess the relationships between the PACS-R and other theoretically related variables.

Finally, using the tripartite influence model as a theoretical framework, hierarchical multiple regression analyses were performed within men and women samples separately to evaluate the PACS-R as a predictor of theorized outcome variables (body dissatisfaction and eating disturbances), controlling for internalization of the thin and muscular ideals, appearance-related pressures and BMI. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, homoscedasticity and multicollinearity. Multicollinearity was deemed to be a concern if the variance inflation factor (VIF) coefficient was greater than 10 or tolerance values were less than .10 (Belsley et al., 1980; Hair et al., 2010).

RESULTS

Internal structure

An EFA was performed to data from sample 1 (n= 703). KMO and Barlett's tests indicated the adequacy of data for factor analysis, KMO= .960, χ^2 (55, n= 703)= 8741.934; p< .001. Based on the number of eigenvalues that were greater than or equal to 1.0, the examination of the scree plot, and the results from the parallel analysis, a one-factor solution emerged.

Communalities ranged between .516 and .838, and the percentage of explained variance was 73.26%. The corresponding factor loadings of these items were acceptable, since they reached .30 in all cases, as shown in Table 1.

A CFA was then performed with sample 2 (n= 702) to test the one-factor structure previously obtained. The assessment of multivariate normality indicated that the data did not fit multivariate normality, as Mardia's estimate for multivariate kurtosis was 50.785.

The CFA using all 11 items indicated good model fit according to goodness of fit indices and SRMR, χ^2 (df= 44, n= 702)= 142.606, CFI= .998, GFI= .998, NFI= .998, SRMR= .033, and marginal fit according to the RMSEA (RMSEA= .057). Standardised regression weights ranged from .693 to .929.

Table 1. Factor loadings of the PACS-R questionnaire in a mixed-gender sample.

		Communalities	Factor loadings
Item 1	Cuando estoy en público, comparo mi apariencia física con la apariencia de los demás [When I'm out in public, I compare my physical appearance to the appearance of others]	0.674	0.821
Item 2	Cuando conozco a una persona nueva (de mi mismo sexo), comparo el tamaño de mi cuerpo con el tamaño de su cuerpo [When I meet a new person (same sex), I compare my body size to his/her body size]	0.765	0.874
Item 3	Cuando estoy en el trabajo o en el colegio, comparo mi forma del cuerpo con la forma del cuerpo de los demás [When I'm at work or school, I compare my body shape to the body shape of others]	0.802	0.896
Item 4	Cuando estoy en público, comparo mi grasa corporal con la grasa corporal de los demás [When I'm out in public, I compare my body fat to the body fat of others]	0.808	0.899
Item 5	Cuando estoy comprando ropa, comparo mi peso con el peso de los demás [When I'm shopping for clothes, I compare my weight to the weight of others]	0.709	0.842
Item 6	Cuando estoy en una fiesta, comparo la forma de mi cuerpo con la forma del cuerpo de los demás [When I'm at a party, I compare my body shape to the body shape of others]	0.745	0.863
Item 7	Cuando estoy con un grupo de amigos/as, comparo mi peso con el de los demás [When I'm with a group of friends, I compare my weight to the weight of others]	0.769	0.877
Item 8	Cuando estoy en público, comparo el tamaño de mi cuerpo con el tamaño del cuerpo de los demás [When I'm out in public, I compare my body size to the body size of others]	0.838	0.915
Item 9	Cuando estoy con un grupo de amigos/as, comparo el tamaño de mi cuerpo con el tamaño del cuerpo de los demás [When I'm with a group of friends, I compare my body size to the body size of others]	0.815	0.903
Item 10	Cuando estoy comiendo en un restaurante, comparo mi grasa corporal con la grasa corporal de los demás [When I'm eating in a restaurant, I compare my body fat to the body fat of others]	0.618	0.786
Item 11	Cuando estoy en el gimnasio, comparo mi apariencia física con la apariencia de los demás [When I'm at the gym, I compare my physical appearance to the appearance of others]	0.516	0.718
Eigenvalues			8.315

Internal consistency

Internal consistency of PACS-R was excellent. In sample 1, Cronbach's alpha for the scale was .956 among men and .967 among women. In sample 2, Cronbach's alpha was .958 among men and .965 among women. McDonald's omega was .958 for men and .968 for women in sample 1, and .960 for men and .966 for women in sample 2. All items in the PACS-R exhibited corrected item-total correlations of .71 or higher in sample 1, and .68 or higher in sample 2 (table 2).

Item means ranged from 0.89 to 2.03 in sample 1, and from 0.80 to 2.03 in sample 2 (Table 2). The average PACS-R score in the whole sample was 1.13 (SD= 0.98) for men and 1.58 (SD= 1.16) for women. The *t*-test revealed that there was a significant difference in scores for men and women, *t* (343.32)= -6.04, p< .001. The magnitude of the differences in the means was small (Hedges' g= .40).

Table 2. Item descriptive statistics and corrected item-total correlations for PACS-R in a mixed-gender sample.

Item	M (SD)		Item-total correlation	
	Sample 1	Sample 2	Sample 1	Sample 2
1	2.03 (1.20)	2.03 (1.21)	.807	.799
2	1.73 (1.36)	1.75 (1.37)	.858	.847
3	1.73 (1.36)	1.71 (1.32)	.878	.877
4	1.39 (1.38)	1.31 (1.33)	.882	.862
5	1.20 (1.38)	1.18 (1.33)	.828	.816
6	1.68 (1.39)	1.60 (1.36)	.848	.838
7	1.39 (1.33)	1.32 (1.33)	.860	.847
8	1.47 (1.32)	1.49 (1.35)	.898	.909
9	1.48 (1.33)	1.46 (1.34)	.885	.874
10	0.89 (1.24)	0.80 (1.18)	.775	.765
11	1.76 (1.41)	1.82 (1.39)	.707	.681

Test-retest reliability

The test-retest reliability for the PACS-R was good, with an intraclass correlation coefficient of *r*= .892 (p< .001). The average PACS-R scores of the subset of the sample that completed the questionnaire twice (*n*= 165) were 1.54 (SD= 1.12) at first administration of the questionnaire, and 1.52 (SD= 1.12) at second administration.

Convergent validity

A correlation analysis showed significant associations between the PACS-R scores and the examined variables in the hypothesized directions in both genders (see table 3). As expected, the PACS-R was significantly positively correlated with measures of body dissatisfaction, drive for thinness, disordered eating behaviours, social comparison tendency, internalization of appearance ideals, and appearance-related pressures from family, peers, and the media. The PACS-R was significantly negatively correlated with measures of perceived physical attractiveness and self-esteem. The only relationship that was not statistically significant was the correlation between the PACS-R and the oral control subscale of the EAT-26 in men. Correlations between the PACS-R and convergent measures were generally stronger within the women sample compared to the men sample.

Finally, the correlation between the PACS-R and BMI was found to be statistically significant both in men and women, although the correlation coefficients were low (men: $r = .14$, $p < .05$; women: $r = .08$, $p < .01$).

Table 3. Correlations and descriptive statistics for all study variables.

Question-naire	Subscale	M (SD)	Correlation with PACS-R
MBSRQ	Self-assessed physical attractiveness	3.15 (0.99) / 2.98 (1.02)	- .47*** / - .60***
SATAQ-4	Internalization: Thin	2.55 (1.02) / 2.83 (1.13)	.60*** / .69***
	Internalization: Muscular	2.61 (0.95) / 2.24 (0.92)	.41*** / .40***
	Pressures: Family	1.99 (1.07) / 2.06 (1.07)	.44*** / .31***
	Pressures: Peers	1.62 (0.81) / 1.59 (0.84)	.41*** / .38***
	Pressures: Media	2.49 (1.38) / 3.17 (1.39)	.54*** / .46***
INCOM	Total score	35.49 (9.15) / 37.18 (8.61)	.51*** / .54***
RSES	Total score	31.93 (6.33) / 28.48 (6.75)	- .43*** / - .58***
EDI-3	Drive for thinness	6.05 (6.21) / 9.13 (8.04)	.65*** / .68***
	Body dissatisfaction	9.48 (8.74) / 13.78 (9.63)	.61*** / .64***
EAT-26	Total score	5.73 (6.35) / 9.08 (11.80)	.56*** / .60***
	Dieting	3.55 (4.35) / 5.40 (7.33)	.58*** / .63***
	Bulimia and food preoccupation	1.02 (1.77) / 1.65 (2.98)	.45*** / .53***
	Oral control	1.16 (1.90) / 2.03 (3.18)	.13 / .28***

Note. Means and correlation coefficients appear before the backlash for men and after for women. MBSRQ: Multidimensional Body-Self Relations Questionnaire; SATAQ-4: Sociocultural Attitudes Towards Appearance Questionaire-4; INCOM: Iowa-Netherlands Comparison Orientation Measure; RSES: Rosenberg Self-Esteem Scale; EDI-3: Eating Disorders Inventory-3; EAT-26: Eating Attitudes Test-26; M: Mean; SD: Standard Deviation; PACS-R = Physical Appearance Comparison Scale-Revised.
****p < .001*

Multiple regression analyses

Results from the hierarchical multiple regression analyses using the women and men samples can be found in tables 4 and 5 respectively. Multicollinearity was judged to not be a problem in any of the samples (women sample: tolerance ≥ 0.39, VIF ≤ 2.59; men sample: tolerance ≥ 0.40, VIF ≤ 2.50), and the other preliminary analyses ensured no violation of the assumptions of normality, linearity and homoscedasticity.

Regarding the women sample, results from step 2 in the analyses indicated that the PACS-R was a significant predictor of body dissatisfaction (β = 0.37, p < .001) and disordered eating (β = 0.28, p < .001). After controlling for internalization of appearance ideals, appearance pressures and BMI, the PACS-R accounted for 6.5% of the variance in body dissatisfaction, and the total variance explained by the model as a whole was 57.5% (F(7, 1162) = 224.42, p < .001). The PACS-R also accounted for 3.2% of the variance in disordered eating after controlling for internalization of appearance ideals, appearance pressures, BMI and body dissatisfaction, and the total variance explained by the whole model was 45.2% (F(8, 1161) = 119.87, p < .001). The PACS-R was the strongest predictor of body dissatisfaction and disordered eating, as it was observed when the standardized regression coefficients in step 2 of the regression analyses were compared.

Table 4. Hierarchical regression analysis predicting body dissatisfaction and disordered eating in women.

Variable	Step 1			Step 2		
	R^2	Δ F	β	R^2	Δ F	β
Criterion variable:						
Body dissatisfaction						
SATAQ4-TI			0.56***			0.36***
SATAQ4-MI			- 0.09**			- 0.10***
SATAQ4-FP			0.10***			0.09**
SATAQ4-PP			0.09**			0.04
SATAQ4-MP			0.05*			0.01
BMI			0.27***			0.27***
PACS-R						0.37***
	0.51	201.43***		0.58	178.22***	
Criterion variable:						
Disordered eating						
SATAQ4-TI			0.30***			0.20***
SATAQ4-MI			0.06*			0.04
SATAQ4-FP			0.01			0.01
SATAQ4-PP			0.09**			0.07*
SATAQ4-MP			- 0.006			- 0.05
BMI			- 0.15***			- 0.12***
EDI3-BD			0.37***			0.27***
PACS-R						0.28***
	0.42	120.34***		0.45	68.01***	

Note. *SATAQ4-TI: Thin Ideal Internalization subscale of the Sociocultural Attitudes Towards Appearance Questionaire-4; SATAQ4-MI: Muscular Ideal Internalization subscale of the Sociocultural Attitudes Towards Appearance Questionaire-4; SATAQ4-FP: Family Pressures subscale of the Sociocultural Attitudes Towards Appearance Questionaire-4; SATAQ4-PP: Peer Pressures subscale of the Sociocultural Attitudes Towards Appearance Questionaire-4; SATAQ4-MP: Media Pressures subscale of the Sociocultural Attitudes Towards Appearance Questionaire-4; BMI: Body Mass Index; PACS-R: Physical Appearance Comparison Scale-R; EDI3-BD: Body Dissatisfaction subscale of the Eating Disorders Inventory-3.*

**p < .05; **p < .01; ***p < .001*

In the men sample, the PACS-R was also a significant predictor of body dissatisfaction (β = 0.40, $p < .001$) and disordered eating (β = 0.31, $p < .001$) in step 2. The PACS-R accounted for 7.5% of the variance in body dissatisfaction after controlling for internalization of appearance ideals, appearance pressures and BMI, and the total variance explained by the model as a whole was 59.1% ($F(7, 211) = 43.61$, $p < .001$). Similarly, the PACS-R accounted for 3.8% of the variance in disordered eating after controlling for internalization of appearance ideals, appearance pressures, BMI and body dissatisfaction, and the total variance explained by the model was 42.3% ($F(8, 210) = 19.23$, $p < .001$). The PACS-R was the strongest predictor of body dissatisfaction and the second strongest predictor of disordered eating.

Table 5. Hierarchical regression analysis predicting body dissatisfaction and disordered eating in men.

Variable	Step 1			Step 2		
	R^2	Δ F	β	R^2	Δ F	β
Criterion variable: **Body dissatisfaction**						
SATAQ4-TI			0.35***			0.23***
SATAQ4-MI			- 0.16**			- 0.23***
SATAQ4-FP			0.26***			0.18**
SATAQ4-PP			0.10			0.09
SATAQ4-MP			0.18**			0.04
BMI			0.16**			0.18***
PACS-R						0.40***
	0.52	37.71***		0.59	38.74***	
Criterion variable: **Disordered eating**						
SATAQ4-TI			0.39***			0.33***
SATAQ4-MI			0.14*			0.07
SATAQ4-FP			0.05			0.03
SATAQ4-PP			0.01			0.02
SATAQ4-MP			- 0.002			- 0.09
BMI			- 0.04			- 0.01
EDI3-BD			0.22**			0.10
PACS-R						0.31***
	0.39	18.83***		0.42	13.95***	

Note. SATAQ4-TI: Thin Ideal Internalization subscale of the Sociocultural Attitudes Towards Appearance Questionaire-4; SATAQ4-MI: Muscular Ideal Internalization subscale of the Sociocultural Attitudes Towards Appearance Questionaire-4; SATAQ4-FP: Family Pressures subscale of the Sociocultural Attitudes Towards Appearance Questionaire-4; SATAQ4-PP: Peer Pressures subscale of the Sociocultural Attitudes Towards Appearance Questionaire-4; SATAQ4-MP: Media Pressures subscale of the Sociocultural Attitudes Towards Appearance Questionaire-4; BMI: Body Mass Index; PACS-R: Physical Appearance Comparison Scale-R; EDI3-BD: Body Dissatisfaction subscale of the Eating Disorders Inventory-3.

**p < .05; **p < .01; ***p < .001*

DISCUSSION

The primary objective of this study was to validate the PACS-R in a mixed-gender Spanish community sample. In order to assess its psychometric properties, we first evaluated the underlying latent structure through principal axis factoring and Promax oblique rotation EFA with a first split-half of the sample, which was later assessed through CFA with the second half of the sample. The analyses indicated that a one factor solution was the best fit for the data, replicating the original single-factor structure described by the original authors (Schaefer & Thompson, 2014).

The study's results support the reliability and validity of the Spanish version of the PACS-R in women and men. Internal consistency and test-retest reliability were excellent in both subsamples. Furthermore, Spanish PACS-R scores had good patterns of convergent validity in both genders: as hypothesized, appearance comparison tendency was significantly associated with self-assessed physical attractiveness, internalization of appearance ideals, appearance-related sociocultural pressures, social comparison tendency, self-esteem, drive for thinness, body dissatisfaction and disordered eating in the expected directions. The relationship between appearance comparison and oral control was however different according to gender. While we found the expected positive association in women, the association in men did not reach significance. The oral control subscale includes items that relate to self-control of eating and the perceived pressure from others to gain weight (Garner et al., 1982). Differences found between men and women could suggest that physical appearance comparison is directly related to restrictive eating among women, whereas it is not necessarily focused on eating control to achieve a thin ideal among men. Correlations were generally weaker among men, consistent with previous literature suggesting a significant but smaller impact of appearance comparisons among males (Carlson Jones, 2004; Davison & McCabe, 2005). However, this was not the case for internalisation of the muscular ideal and perceived pressures to attain the beauty ideal, where the correlations were stronger for men. This might be related to the fact that muscularity-oriented comparisons seem to play a key role in men's body image (Fatt et al., 2019; Lavender et al., 2017), even though future research

could examine the reasons for the stronger associations between appearance comparison and perceived pressures to attain the ideal appearance in men.

Regression analyses indicated that the physical appearance comparison measured through PACS-R significantly predicts body dissatisfaction and disordered eating when controlling for other theorized predictors, both in men and women. Hence, we replicated the adequate predictive ability described by the original authors (Schaefer & Thompson, 2014).

Regarding gender differences, our results revealed that men engage in fewer appearance comparisons than women, which is consistent with previous literature (e.g. Davison & McCabe, 2006). Our findings also indicated that the Spanish PACS-R is able to assess physical appearance comparisons in both men and women. Interestingly, the results from the regression analyses revealed that beta-regression coefficients in the men subsample were higher compared to the ones observed in the women subsample. The higher a beta-coefficient is, the higher is the contribution of the covariate (PACS-R score in this case) to the mean predicted value of the criterion variables (body dissatisfaction and disordered eating). Hence, even though female validated measures were used, PACS-R scores might predict to a higher extent body dissatisfaction and disordered eating in men than in women, which seem to contradict the literature stating that physical comparisons in men are less associated with negative feelings about their body. Further research could shed light on this. Moreover, future studies should delve into the differences in physical appearance comparisons between genders, as men's body image concerns could be related to muscularity, which makes the body-related pressures more complex.

Furthermore, it should be noted that our sample included participants from a wide range of ages. While the original version of the PACS-R and its expanded version (PACS-3) included samples of undergraduate students, our study's participants' ages ranged between 14 and 64. This might have practical implications, suggesting that the Spanish PACS-R is a useful tool not only for adolescents but also for older populations.

This study has several limitations, basically related to the sampling procedure. First, it has to be noted that women constituted the majority of the sample

(83.6%), which might have had an impact on the results found in the present study. In this regard, results have been presented according to gender, but it is a limitation that needs to be taken into consideration. Second, as participants' recruitment was conducted online, the sample of the present study is not representative of the Spanish population. Third, even though this research reported the prevalence of participants who did not identify within the gender binary system as recommended by Cameron and Stinson (2019), these participants were not included in the statistical analyses that were conducted separately for men and women, as previously mentioned.

Further research should examine the psychometric properties of the tool in both clinical samples and more diverse populations, in order to test its psychometric properties in other Spanish-speaking samples, countries, and ethnic groups.

In conclusion, this research indicates that the translated version of the PACS-R might be a useful tool to assess physical appearance comparison tendency in Spanish populations in both men and women and across a wide range of ages. The scale provides clinicians and researchers with a valid and reliable instrument to assess appearance comparisons, and it has the ability to predict body dissatisfaction and disordered eating, which are widely recognised as important risk factors for developing an eating disorder.

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APPENDIX A: Spanish translation of the PACS-R

La gente a veces compara su apariencia física con la de los demás. Esto puede significar una comparación del peso, del tamaño del cuerpo, de la forma del cuerpo, de la grasa del cuerpo o de la apariencia en general. Por favor, pensando en cómo te comparas con los demás generalmente, utiliza la siguiente escala para puntuar con qué frecuencia realizas este tipo de comparaciones.

Nunca	Pocas veces	A veces	A menudo	Siempre
0	**1**	**2**	**3**	**4**

1.	Cuando estoy en público, comparo mi apariencia física con la apariencia de los demás	0	1	2	3	4
2.	Cuando conozco a una persona nueva (de mi mismo sexo), comparo el tamaño de mi cuerpo con el tamaño de su cuerpo	0	1	2	3	4
3.	Cuando estoy en el trabajo o en el colegio, comparo mi forma del cuerpo con la forma del cuerpo de los demás	0	1	2	3	4
4.	Cuando estoy en público, comparo mi grasa corporal con la grasa corporal de los demás	0	1	2	3	4
5.	Cuando estoy comprando ropa, comparo mi peso con el peso de los demás	0	1	2	3	4
6.	Cuando estoy en una fiesta, comparo la forma de mi cuerpo con la forma del cuerpo de los demás	0	1	2	3	4
7.	Cuando estoy con un grupo de amigos/as, comparo mi peso con el de los demás	0	1	2	3	4
8.	Cuando estoy en público, comparo el tamaño de mi cuerpo con el tamaño del cuerpo de los demás	0	1	2	3	4
9.	Cuando estoy con un grupo de amigos/as, comparo el tamaño de mi cuerpo con el tamaño del cuerpo de los demás	0	1	2	3	4
10.	Cuando estoy comiendo en un restaurante, comparo mi grasa corporal con la grasa corporal de los demás	0	1	2	3	4
11.	Cuando estoy en el gimnasio, comparo mi apariencia física con la apariencia de los demás	0	1	2	3	4

STUDY 2

3.2. Study 2: The impact of COVID-19 pandemic and lockdown measures on eating disorder risk and emotional distress among adolescents and young people in Spain

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The impact of COVID-19 pandemic and lockdown measures on eating disorder risk and emotional distress among adolescents and young people in Spain

Helena Vall-Roqué[1], Ana Andrés[2] & Carmina Saldaña[1]

[1] Department of Clinical Psychology and Psychobiology, Faculty of Psychology, Universitat de Barcelona, Barcelona, Spain.

[2] Faculty of Psychology, Education Sciences and Sport, Ramon Llull University, Barcelona, Spain.

Corresponding author: Helena Vall-Roqué. Department of Clinical Psychology and Psychobiology, Faculty of Psychology, Universitat de Barcelona, Passeig Vall d'Hebron, 171, 08035 Barcelona, Spain.

Abstract

This cross-sectional study aimed to determine the impact of COVID-19 lockdown on emotional distress and disordered eating in a community sample of Spanish youngsters. A total of 2847 participants (95% women; aged 14-35) completed depression, anxiety, stress, self-esteem, and disordered eating measures. Given the small proportion of men and as significant differences were found between genders in several variables, most results were only reported for women. Severe levels of depression, anxiety and stress were found in 30.8%, 25.4% and 20.5% of the sample, respectively. Sleep quality, eating habits, appearance concerns, preoccupation about one's future, health concerns and other life domains were also affected by lockdown. Younger age, being single, being unemployed, not having contracted COVID-19 or not being sure about it, having a loved one infected or deceased due to coronavirus, and not having a place to relax at home were significantly associated with psychological distress and disordered eating. A structural equation model confirmed the direct influence of lockdown-related variables into psychopathology symptoms. The findings of this study suggest that COVID-19 and its associated lockdown might have a significant effect on psychological wellbeing and eating disturbances.

Keywords

COVID-19, disordered eating, depression, anxiety, stress, emotional distress.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by acute respiratory syndrome coronavirus-2 (SARS-CoV-2) that spreads rapidly, posing a significant threat to global health. Even though the disease started as an epidemic mainly limited to China, it was declared a pandemic the 11th March 2020 by the World Health Organization (WHO).

The current study was conducted in Spain, which was the third country in the world with more deaths recorded per 100,000 inhabitants when the data for this research was collected, in mid-May (John Hopkins Coronavirus Resource Center, 2020).

Consequently, a great amount of the Spanish population has been forced to remain at home for at least 6 weeks, as the Spanish cabinet declared a state of emergency on 14 March, placing the entire country in lockdown. On 28 April, the Spanish government announced a four-phase lockdown exit strategy for the country which started the 2nd of May. This plan was divided into four phases, which were gradually implemented according to the epidemiological situation of each province. The de-escalation plan started 10 days before the data for this research was collected.

According to the review conducted by Brooks et al. (2020), quarantines are associated with negative psychological effects including post-traumatic stress symptoms, confusion, and anger. Several research articles that have been published within the last three months have stated that the COVID-19 outbreak and its associated quarantine might be linked to anxiety, depression, stress, post-traumatic stress disorder and disturbed sleep (Cao et al., 2020; Liang et al., 2020; Rajkumar, 2020). Furthermore, it has been suggested that the most vulnerable collectives might be women and young individuals (Liu et al., 2020; Ozamiz-Etxebarria, Dosil-Santamaria, Picaza-Gorrochategui, & Idoiaga-Mondragon, 2020; Sun et al., 2020; Wang et al., 2020).

The relationship among variables related to the lockdown and their effect on psychological distress and psychopathology symptoms is complex. A few studies have applied structural equation modeling (SEM) to analyse the effect of variables related to the lockdown due to COVID-19 on diverse settings. Some of these studies are focused on predicting the compliance of population

with prevention guidelines, or the effect of the lockdown on tourism, or customer behavioural intentions in stores (Plohl & Musil, 2020; Rukini & Maziriri, 2020; Zhu & Deng, 2020), while others have focused on the analysis of the lockdown in psychological variables. Specifically, these studies have been carried out in China, aiming to analyze the mediation effect of alexithymia on mental health problems (Tang, Hu, Yang & Xu, 2020), or the impact of social capital into psychological distress and quality of sleep during the lockdown (Xiao, Zhang, Kong, Li, & Yang, 2020). Finally, other studies have focused on the role of social support and resilience on the prevention of psychological distress of Chinese health care staff (Hou et al., 2020; Xiao et al., 2020).

However, there is a lack of studies considering the multivariate effect of the psychological impact of the lockdown on psychological distress and eating disorder risk. Moreover, only a few studies have been conducted in Spain, and the effects of COVID-19 outbreak and its associated lockdown on emotional distress and disordered eating are still largely unknown. For instance, Ozamiz-Etxebarria et al. (2020) found low levels of depression, anxiety and stress in a Northern Spanish sample when the COVID-19 outbreak had recently emerged in Spain. On the contrary, Odriozola-González, Planchuelo-Gómez, Irurtia, & de Luis-García (2020) reported that 20-35% of their sample exhibited high levels of depression, anxiety, and stress.

This study aimed to determine the impact of COVID-19 lockdown on depression, anxiety, stress, self-esteem, and disordered eating in a community sample of Spanish adolescents and young people.

METHOD

Participants

A total of 3378 participants from a community sample participated in the present study. Participants that did not live in Spain, those presenting missing data in the sociodemographic questions or in the COVID-related items, women who reported to be pregnant, and those who were older than 35 years old or younger than 14 years old (n= 531) were excluded from the analyses, yielding the final sample of 2847 participants. 2709 participants were women

(95.15%), 128 were men (4.50%), and 10 identified themselves as nonbinary (0.35%).

Instruments

a) *Ad hoc demographic questionnaire*. Participants self-reported their age, gender, place of residence (city/town in Spain, rural area in Spain, or outside Spain), employment situation, relationship status, height, and weight. Height and weight measures were used to calculate body mass index (BMI).

b) *COVID-19 and lockdown-related information ad hoc questionnaire*. Participants were asked whether they had contracted COVID-19, whether they had any relative or close person who had suffered the virus and if any loved one had deceased due to COVID-19. Those who had suffered the loss of a close person due to COVID-19 also indicated whether they had had the chance to say goodbye.

   Participants that were enrolled in an academic course reported whether they had experienced any of a list of changes (problems with online lectures, increase in assignments, decrease in assignments, increase in course disorganization). Moreover, a 5-point Likert scale ranging from “has changed a lot to worse” to “has changed a lot to better” was used to assess the degree in which the following aspects of participants’ life had changed since the lockdown began: eating habits, physical activity, appearance concerns, sleep quality, self-caring time, health concerns, own’s future concerns, feelings of anxiety, sadness, loneliness and autonomy, consumption of alcohol, tobacco and other drugs, and family, friends, couple and sexual relationships. Higher scores indicated that participants thought that these areas had changed to better since the lockdown began.

   Finally, participants were asked to indicate whether they felt they had a place for themselves in their homes where they could relax.

c) *Depression, Anxiety and Stress Scales-21* (DASS-21; Lovibond & Lovibond, 1995), adapted to Spanish by Bados, Solanas, & Andrés (2005). The DASS-21 is a self-report questionnaire that measures symptoms of

depression, anxiety, and stress in both clinical and non-clinical samples. Items are presented in a 4-point Likert scale ranging from “Did not apply to me at all” to “Applied to me very much, or most of the time”. It has three 7-item-subscales: depression, anxiety, and stress. The questionnaire has been reported to have acceptable internal reliability in Spanish samples, with Cronbach’s alphas of .84, .70 and .82 for the depression, anxiety, and stress subscales, respectively (Bados et al., 2005). Cronbach’s alphas in the current study were .90, .83, and .82 for the depression, anxiety, and stress subscales, respectively. Cronbach’s alpha for the whole scale was 0.93.

d) *Eating Attitudes Test-26* (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982), adapted to Spanish by Castro, Toro, Salamero, & Guimerá (1991). The EAT-26 is a 26-item self-report questionnaire that measures disordered eating behavior and attitudes. Items are presented in a 6-point Likert scale ranging from “Never” to “Always”, and higher scores indicate higher levels of eating disturbances. It has three subscales: dieting, bulimia and food preoccupation, and oral control. The questionnaire has been shown to have adequate psychometric properties, and the alpha reliability coefficient in a Spanish sample was .93 (Castro et al., 1991). Cronbach’s alpha in the current study was .90.

e) *Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1965), adapted to Spanish by Martín-Albo, Núñez, Navarro, & Grijalvo (2007). The RSES is a widely used 10-item questionnaire that assesses global self-esteem and general feelings of self-worth with a 4-point Likert scale, ranging from “Strongly disagree” to “Strongly agree”. Higher scores indicate higher self-esteem. The scale has been reported to have a one-factor structure and satisfactory levels of internal consistency (Cronbach’s alpha of .85) in Spanish samples (Martín-Albo et al., 2007). Cronbach’s alpha in this study was .91.

Procedure

The study was approved by the University of Barcelona's Bioethics Commission. All measures were administered online through a secure internet-based website. Participants gave their informed consent before completing questionnaire measures, and they did not receive compensation for their participation. In the case of under-aged participants, parental consent was not requested as the Spanish law states that it is only required for individuals under 14 years old for this type of studies (Organic Law 3/2018 for Data Protection and guarantee of Digital Rights, articles 6 and 7).

A cross-sectional web-based survey design was adopted. Participants were recruited through social networking sites from 12 May until 17 May. When the data was collected, Spanish population were allowed to engage in individual sport activities, including going for a walk, for a limited time per day. In 26 provinces (comprising 51% of the Spanish population), from 11 May it was also permitted to visit friends and family living in the same province, still with social distancing measures.

Data analysis

All data were analyzed using SPSS v. 20 and AMOS v. 20. Participants were divided into two age categories: generation Z, which comprised individuals that were aged from 14 to 24, and generation Y, which included participants that were between 25 and 35 years old. Generational cohorts were established based on Francis & Hoefel (2018) and Duffy et al. (2018).

Cut off scores for the DASS-21, the RSES and the EAT-26 were taken from Gale (2015), Isomaa, Väänänen, Fröjd, Kaltiala-Heino, & Marttunen (2013), and Garner et al. (1982), respectively.

Descriptive statistics (frequency, percentages, mean, and standard deviation) were used for assessing the sociodemographic characteristics of the sample, the COVID-19 and lockdown-related variables and the mental health status of participants. Chi-square tests of independence were performed to examine the relation between gender and categorical variables, and *t* Student tests

were conducted to explore the relationship between gender and the scores in all psychological variables.

Mean comparisons were conducted through Student's *t* tests and one-way ANOVAs in order to assess whether the sociodemographic and COVID-19 variables were significantly associated with each psychological variable. If Levene's test of homogeneity of variance was violated, the Brown-Forsyth statistic was reported. Statistically significant effects from the one-way ANOVAs were followed up by Tukey post hoc tests when data met the homogeneity of variances assumption, and by Games-Howell post hoc tests when homogeneity of variances' assumption was violated.

Structural equation modelling was conducted. Data did not fit multivariate normality according to Bentler (2005) cut-off value for Mardia's normalized estimate. Therefore, the unweighted least squares (ULS) estimation method was applied. Several goodness-of-fit indices were calculated: chi-square test, goodness-of-fit index (GFI), comparative fit index (CFI; Bentler, 1990), normed fit index (NFI; Bentler & Bonet, 1980), and the standardized root mean square residual (SRMR; Jöreskog & Sörbom, 1986). The cut-off values to determine a good fit were equal or higher than 0.90 for GFI, CFI and NFI (Jackson, Gillaspy & Purc-Stephenson, 2009), and equal or lower than 0.08 for SRMR (Hu & Bentler, 1999).

Descriptive analyses considering COVID-19 variables and psychological status of participants were conducted with the whole sample. However, taking into consideration the small proportion of men in the sample, the significant differences found between men and women in a number of sociodemographic and psychological variables, and the differential psychological impact of COVID-19 in men and women reported in the literature (e.g. Liu et al., 2020; Sun et al., 2020; Wang et al., 2020), only women were included in the results regarding the perceived changes due to COVID-19, the ANOVAs and the structural equation model.

RESULTS

Descriptive statistics

Participants ranged in age from 14 to 35, with a mean age of 24.08 years (SD= 5.04) in women and 22.79 years (SD= 4.62) in men. 1678 women (61.9% of the women subsample) and 99 men (77.3% of the men subsample) were aged between 14 and 24, and 1031 women and 29 men were aged between 25 and 35. Mean sample BMI was 23.80 kg/m^2 (SD= 5.07) in women, and 24.26 kg/m^2 (SD= 4.89) in men. The frequencies and percentages of the other sociodemographic and COVID-19-related variables are reported in table 1.

Chi-square tests of independence were performed to examine the relation between gender and sociodemographic and COVID-19-related variables. Statistically significant differences were found between genders in the following variables: employment status (χ^2= 13.43, p< .05), current and pre-lockdown relationship status (χ^2= 15.33, p< .001, and χ^2= 16.77, p< .001, respectively), and feeling of having a place to relax at home (χ^2= 8.81, p< .01).

Table 1. Participants' sociodemographic, COVID-19 and lockdown-related descriptive statistics divided by age group and gender.

	Women		Men	
	Aged 14-24 No. (%)	Aged 25-35 No. (%)	Aged 14-24 No. (%)	Aged 25-35 No. (%)
Place of residence				
City or town in Spain	1028 (61.3)	621 (60.2)	56 (56.5)	15 (51.7)
Rural area in Spain	650 (38.7)	410 (39.8)	43 (43.4)	14 (48.3)
Employment status				
Not working (e.g. student)	1220 (72.7)	167 (16.2)	76 (76.8)	4 (13.8)
Employee / Self-employed	244 (14.3)	541 (52.4)	12 (12.1)	16 (55.2)
Temporary leave	13 (0.8)	44 (4.3)	1 (1)	2 (6.9)
Unemployed	120 (7.2)	158 (15.3)	9 (9.1)	6 (20.7)
Other	85 (5.1)	121 (11.7)	1 (1)	1 (3.4)
Current relationship status				
Single	892 (53.2)	230 (22.3)	65 (65.7)	10 (34.5)

In a relationship / Married	772 (46)	793 (76.9)	34 (34.3)	19 (65.5)
Other	14 (0.8)	8 (0.8)	-	-
Relationship status before lockdown				
Single	839 (50)	215 (20.9)	63 (63.6)	10 (34.5)
In a relationship / Married	820 (48.9)	806 (78.2)	35 (35.4)	19 (65.5)
Other	19 (1.1)	10 (1)	1 (1)	-
Infected with COVID-19				
Yes	39 (2.3)	35 (3.4)	2 (2)	-
No	1252 (74.6)	708 (68.7)	77 (77.8)	22 (75.9)
Not sure	387 (23.1)	288 (27.9)	20 (20.2)	7 (24.1)
Loved one infected with COVID-19				
Yes	622 (37.1)	401 (38.9)	36 (36.4)	8 (27.6)
No	852 (50.8)	505 (49)	51 (51.5)	15 (51.7)
Not sure	204 (12.2)	125 (12.1)	12 (12.1)	6 (20.7)
Loved one deceased due to COVID-19				
Yes	183 (10.9)	117 (11.3)	8 (8.1)	2 (6.9)
No	1495 (89.1)	914 (88.7)	91 (91.9)	27 (93.1)
If a loved one deceased: could say goodbye				
Yes	1 (0.5)	7 (6)	-	-
No	182 (99.5)	110 (94)	8 (100)	2 (100)
Own space to relax at home				
Yes	1263 (75.3)	627 (60.8)	84 (84.8)	21 (72.4)
No	415 (24.7)	404 (39.2)	15 (15.2)	8 (27.6)

Note: Percentages are presented per column.

Psychological status of participants

Means and standard deviations of the scores in each psychological questionnaire are shown in Table 2, together with mean comparisons between the scores of men and women. It should be noted that sample sizes differ among questionnaires as not all participants completed all measures. DASS-21 was fulfilled by 2512 women and 112 men, RSES by 2360 women and 104 men, and EAT-26 by 2402 women and 108 men. Significant differences between genders were found in dieting and bulimia and food preoccupation.

Table 3 shows the frequencies and percentages of participants' psychological status' levels. Significant differences between men and women were found in eating disturbances.

Table 2. Mean scores of psychological measures and comparisons between men and women's scores.

	Range	Women *M (SD)*	Men *M (SD)*	*t*	Hedges' *g* [95% CI]
Depression	0-42	16.15 (10.84)	17.61 (11.40)	1.389	
Anxiety	0-42	10.42 (9.25)	9.05 (7.67)	-1.825	
Stress	0-42	17.05 (9.23)	16.71 (8.85)	-0.376	
Self-esteem	10-40	27.52 (6.48)	27.67 (6.56)	0.242	
Dieting	0-39	5.78 (6.64)	3.53 (4.46)	-4.996***	.34 [.15; .54]
Bulimia and food preoccupation	0-18	1.57 (2.55)	1.10 (1.52)	-3.036**	.19 [-.01; .38]
Oral control	0-21	2.01 (2.73)	1.54 (2.95)	-1.760	

*Notes: Sample sizes differ among questionnaires as not all participants completed all measures. DASS-21 was fulfilled by 2512 women and 112 men, RSES by 2360 women and 104 men, and EAT-26 by 2402 women and 108 men. *p< .05; **p< .01; ***p< .001.*

Table 3. Frequencies and percentages of participants' psychological status categories and differences between genders.

Variables/levels	Women *n* (%)	Men *n* (%)	Total *n* (%)	χ^2
Depression				χ^2 (4, 2624)= 8.19, *p*= .085
No evidence	805 (32)	29 (25.9)	834 (31.8)	
Mild	385 (15.3)	21 (18.8)	406 (15.5)	
Moderate	554 (22.1)	24 (21.4)	578 (22)	
Severe	303 (12.1)	8 (7.1)	311 (11.9)	
Extremely severe	465 (18.5)	30 (26.8)	495 (18.9)	
Anxiety				χ^2 (4, 2624)= 9.01, *p*= .061
No evidence	1137 (45.3)	51 (45.4)	1188 (45.3)	
Mild	222 (8.8)	10 (8.9)	232 (8.8)	
Moderate	507 (20.2)	32 (28.6)	539 (20.5)	
Severe	215 (8.6)	10 (8.9)	225 (8.6)	
Extremely severe	431 (17.2)	9 (8)	440 (16.8)	
Stress				χ^2 (4, 2624)= 2.48, *p*= .648
No evidence	1162 (46.3)	50 (44.6)	1212 (46.2)	
Mild	396 (15.8)	21 (18.8)	417 (15.9)	
Moderate	434 (17.3)	23 (20.5)	457 (17.4)	
Severe	360 (14.3)	12 (10.7)	372 (14.2)	
Extremely severe	160 (6.4)	6 (5.4)	166 (6.3)	
Self-esteem				χ^2 (1, 2464)= 0.06, *p*= .813
Adequate or high	1592 (67.5)	69 (66.3)	1661 (67.4)	
Low	768 (32.5)	35 (33.7)	803 (32.6)	
Eating disorders risk				χ^2 (1, 2510)= 8.81, *p*= .003**
Low risk	2076 (86.4)	104 (96.3)	2180 (86.9)	
High risk	326 (13.6)	4 (3.7)	330 (13.1)	

*Notes: Percentages are presented per column. Sample sizes differ among questionnaires as not all participants completed all measures. *p< .05; **p< .01; ***p< .001.*

Perceived changes due to COVID-19 and its associated lockdown in women

As mentioned in the Methods section, from this point onward only women are included in the analyses. At an academic level, 38.1% of women reported that they were currently not studying. From the other respondents, 48.69% had experienced problems with the online lectures (e.g., connectivity issues), 61.58% considered that there had been an increase in assignments since the lockdown began (e.g., homework), 9.96% had experienced a decrease in assignments, 73.87% reported an increase in the courses' disorganization, and 10.38% indicated that they had not experienced significant changes. Table 4 shows the frequencies and percentages of the participants' perceived changes in several life domains.

Table 4. Women's perceived changes in different areas of life since quarantine began.

	Changed to worse since lockdown began *n* (%)		No changes since lockdown began *n* (%)		Changed to better since lockdown began *n* (%)	
Age group	**14-24**	**25-35**	**14-24**	**25-35**	**14-24**	**25-35**
Eating habits	749 (44.6)	478 (46.3)	416 (24.8)	252 (24.4)	513 (30.5)	301 (29.2)
Physical activity	668 (39.8)	447 (43.4)	274 (16.3)	228 (22.1)	736 (43.9)	356 (34.6)
Sleep	1210 (72.1)	706 (68.4)	299 (17.8)	250 (24.2)	169 (10)	75 (7.3)
Self-caring time	425 (25.4)	309 (30)	258 (15.4)	179 (17.4)	995 (59.3)	543 (52.6)
Alcohol consumption	59 (3.5)	73 (7.1)	1121 (66.8)	816 (79.1)	498 (29.7)	142 (13.8)
Tobacco consumption	132 (7.9)	152 (14.7)	1357 (80.9)	825 (80)	189 (11.3)	54 (5.2)
Other drugs consumption	33 (2)	26 (2.5)	1570 (93.6)	993 (96.3)	75 (4.5)	12 (1.2)
Family relationships	437 (26)	212 (20.6)	638 (38)	446 (43.3)	603 (35.9)	373 (36.1)
Friends relationships	353 (21)	202 (19.6)	953 (56.8)	569 (55.2)	372 (22.2)	260 (25.2)
Couple relationship	268 (16)	210 (20.4)	1169 (69.7)	549 (53.2)	241 (14.3)	272 (26.4)
Sexual relationships	665 (39.6)	373 (36.2)	916 (54.6)	496 (48.1)	97 (5.8)	162 (15.7)
Appearance concerns	819 (48.8)	468 (45.4)	557 (33.2)	411 (39.9)	302 (18)	152 (14.7)
Health concerns	854 (50.9)	625 (60.6)	615 (36.7)	310 (30.1)	209 (12.4)	96 (9.3)

Concerns about one's future	1235 (73.6)	783 (76)	293 (17.5)	196 (19)	150 (9)	52 (5.1)
Anxiety	1226 (73)	768 (74.5)	366 (21.8)	215 (20.9)	87 (5.1)	48 (4.7)
Feelings of sadness	1349 (80.4)	798 (77.4)	269 (16)	200 (19.4)	60 (3.6)	33 (3.2)
Feelings of loneliness	1015 (60.5)	520 (50.5)	601 (35.8)	474 (46)	62 (3.7)	37 (3.6)
Feeling of autonomy	597 (35.6)	470 (45.6)	854 (50.9)	470 (45.6)	227 (13.5)	92 (8.8)

Note: Percentages are presented per row and per age group.

Relationship between sociodemographic and COVID-19/lockdown-related variables and psychological status in women

One-way ANOVA and *t*-test results are shown in Table 5. The analyses revealed that the younger age group had significantly higher levels of depression, anxiety, stress and oral control, and significantly lower levels of self-esteem, than the older group. Place of residence did not have a significant association with any psychological variable. Employment situation was significantly related to depression, anxiety, stress, self-esteem, and oral control. *Post-hoc* analyses indicated that participants who were not working (e.g., students) scored significantly higher in depression, anxiety, stress, and oral control, and significantly lower in self-esteem, compared to those who were employees or self-employed. Similarly, those who reported to be unemployed showed significantly higher levels of depression, anxiety, and stress, and a lower self-esteem, than participants that were employed or self-employed. Significant differences were found in depression, self-esteem, and oral control across relationship statuses. *Post-hoc* analyses revealed that those who reported to be single had significantly higher scores in depression and oral control, and significantly lower scores in self-esteem, compared to those who were in a relationship or married. The same significant associations were found regarding pre-lockdown relationship status.

Having contracted or not COVID-19 (or not being sure about it) had a significant impact on depression, anxiety, stress, dieting, and bulimia and food preoccupation. *Post-hoc* analyses revealed that participants that were not

sure about whether they had contracted the virus or not had significantly higher levels of anxiety, stress, dieting and bulimia and food preoccupation in comparison to those who had not contracted COVID-19, and significantly higher levels of stress and depression than those who had indeed suffered COVID-19. Furthermore, those who reported that had not been infected with coronavirus scored significantly higher in stress compared to those who had suffered the virus. Having a loved one that had suffered the virus only had a significant effect on anxiety and oral control. Specifically, according to *post-hoc* analyses, those who reported that a significant other had contracted the virus showed significantly higher levels of anxiety and oral control than those who did not have a loved one who had been infected with the virus. Moreover, participants that were not sure about whether a loved one had suffered coronavirus scored significantly higher in the oral control scale in comparison to those who did not have a significant person that had contracted the virus. Significant differences were found in anxiety, stress, dieting, bulimia and food preoccupation, and oral control depending on whether participants had experienced the loss of a significant person due to COVID-19. Finally, participants that stated that did not have a place at home to relax exhibited significantly higher levels of depression, anxiety, stress, dieting, bulimia and food preoccupation, and significantly lower levels of self-esteem, compared to those who considered that did have that space.

Table 5. Mean comparisons in psychological measures in women according to sociodemographic/COVID-19-related variables.

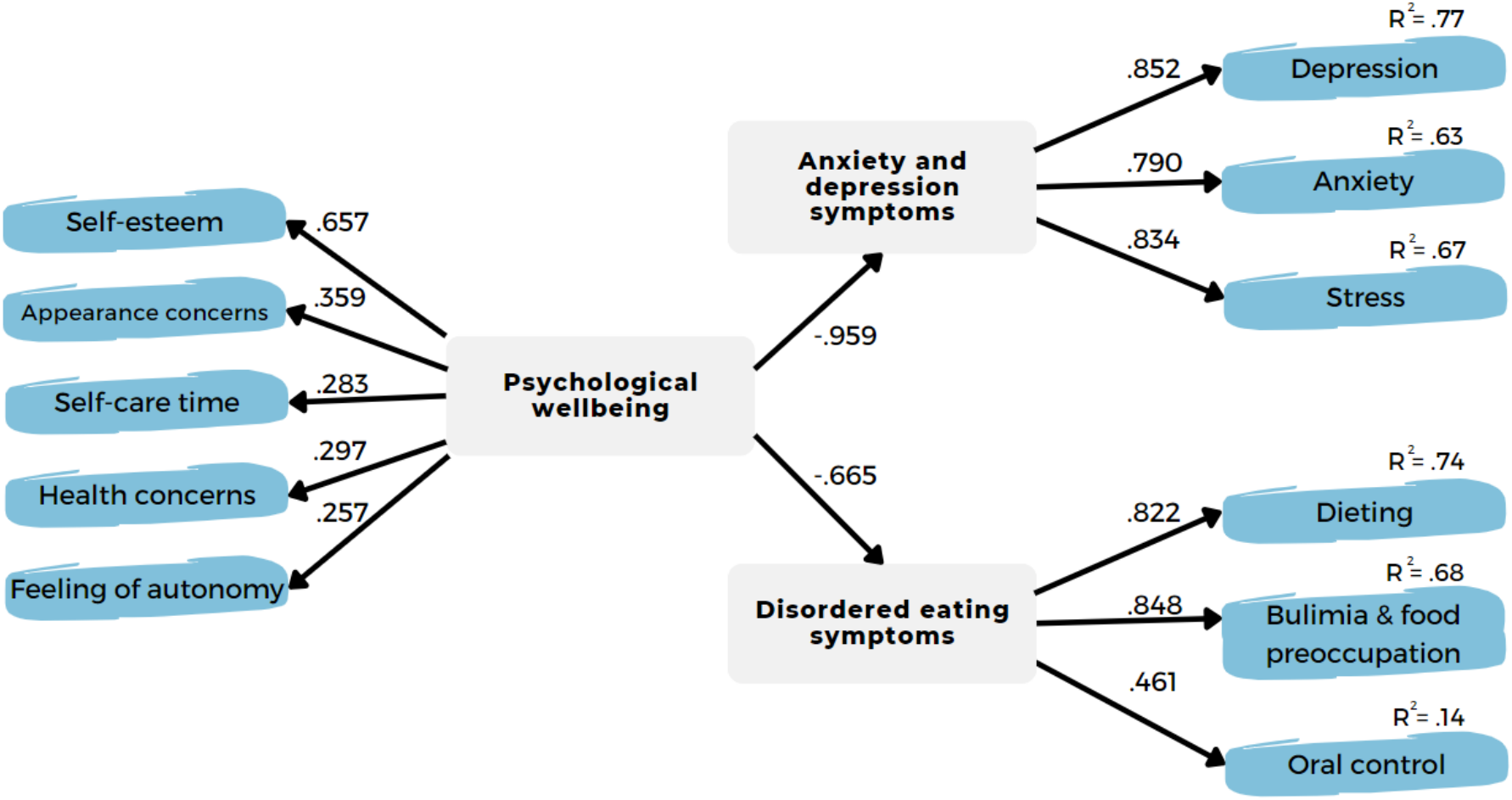
	Depression		Anxiety		Stress		Self-esteem		Dieting		Bulimia and food preoccupation		Oral control	
	M (SD)	*t*/ANOVA	*M (SD)*	*t*/ANOVA	*M (SD)*	*t*/ANOVA	*M (SD)*	*t*/ANOVA	*M (SD)*	*t*/ANOVA	*M (SD)*	*t*/ANOVA	*M (SD)*	*t*/ANOVA
Age group[a]		9.01***		4.47***		4.74***		-6.52***		1.37		-1.02		5.73***
14-24 years old	17.64 (10.88)		11.05 (9.46)		17.74 (9.22)		26.85 (6.42)		5.95 (6.85)		1.54 (2.52)		2.25 (2.96)	
25-35 years old	13.71 (10.31)		9.38 (8.81)		15.92 (9.14)		28.62 (6.42)		5.50 (6.25)		1.62 (2.59)		1.62 (2.25)	
Place of residence[a]		-.91		.79		.76		.99		.72		1.82		.51
City or town	15.99 (10.77)		10.54 (9.30)		17.20 (9.21)		27.61 (6.48)		5.86 (6.62)		1.65 (2.63)		2.03 (2.74)	
Rural area	16.40 (10.94)		10.23 (9.17)		16.81 (9.26)		27.37 (6.48)		5.64 (6.67)		1.46 (2.41)		1.97 (2.72)	
Relationship status[b]		22.52***		1.70		1.08		14.99***		1.48		.51		3.53*
Single	17.67 (11)		10.79 (9.38)		17.07 (9.34)		26.67 (6.38)		6.07 (7.09)		1.63 (2.68)		2.21 (3.07)	
Relationship/Married	15.07 (10.62)		17.17 (9.18)		17.07 (9.17)		28.14 (6.49)		5.56 (6.27)		1.53 (2.44)		1.87 (2.43)	
Other	15.18 (8)		8.59 (6.35)		13.76 (6.67)		27.13 (6)		6.19 (7.8)		1.94 (3.3)		2.06 (3.32)	
Pre-lockdown relationship status[b]		11.8***		.25		.87		12.89***		1.29		.53		4.35*
Single	17.34 (10.96)		10.53 (9.36)		16.78 (9.32)		26.78 (6.36)		6.02 (7.12)		1.61 (2.65)		2.21 (3.09)	
Relationship/Married	15.32 (10.68)		10.33 (9.19)		17.2 (9.18)		28.04 (6.51)		5.6 (6.3)		1.54 (2.47)		1.88 (2.46)	
Other	19.69 (10.71)		11.31 (8.71)		18.31 (8.97)		24.75 (5.91)		6.62 (6.81)		1.96 (2.95)		2.19 (2.62)	
Employment status[b]		31.38***		6.64***		9.33***		21.63***		1.23		1.44		3.28*
Not working	17.95 (10.98)		11.14 (9.63)		17.88 (9.21)		26.6 (6.53)		5.91 (6.83)		1.54 (2.51)		2.15 (2.89)	
Employee/Self-employed	12.72 (9.75)		9.03 (8.76)		15.36 (9.09)		29.38 (6.1)		5.36 (6.18)		1.46 (2.36)		1.74 (2.43)	
Temporary leave	15.74 (10.75)		10.11 (8.87)		17.3 (8.44)		26.88 (6.66)		6.78 (7.43)		2.1 (2.96)		1.64 (3.06)	
Unemployed	17.92 (11.24)		10.85 (8.45)		17.82 (9.07)		26.82 (6.28)		6.15 (6.74)		1.83 (2.84)		1.92 (2.47)	
Other	14.59 (9.91)		10.27 (9.08)		16.66 (9.53)		27. 89 (6.26)		5.64 (6.54)		1.73 (2.86)		2.29 (2.83)	
Contracted COVID-19[b]		3.19*		14.18***		12.11***		1.77		3.43*		3.98*		.10
Yes	13.48 (10.88)		10.06 (8.84)		13.88 (8.83)		27.61 (6.36)		6.53 (6.43)		2 (3.04)		1.95 (2.43)	
No	16.04 (10.73)		9.85 (0.94)		16.71 (9.05)		27.66 (6.49)		5.56 (6.5)		1.49 (2.44)		1.97 (2.73)	
Not sure	16.76 (11.09)		12.11 (9.71)		18.39 (9.61)		27.08 (6.44)		6.32 (6.99)		1.78 (2.76)		2.14 (2.77)	
Loved one infected[b]		2.19		7.05**		1.44		.90		.64		1.49		3.19*
Yes	15.58 (10.74)		10.9 (9.46)		17.14 (9.47)		27.73 (6.39)		5.79 (6.62)		1.62 (2.53)		2.15 (2.92)	
No	16.47 (10.8)		9.76 (8.97)		16.8 (9.03)		27.42 (6.53)		5.67 (6.52)		1.49 (2.5)		1.87 (2.54)	
Not sure	16.64 (11.25)		11.6 (9.55)		17.77 (9.27)		27.23 (6.56)		6.16 (7.13)		1.75 (2.79)		2.17 (2.82)	
Loved one deceased[a]		.75		2.63*		2.75*		.40		2.44*		2.32*		2.75**
Yes	16.55 (10.75)		11.65 (9.61)		18.41 (9.68)		27.71 (6.14)		6.65 (7.65)		1.91 (2.75)		2.52 (3.34)	
No	16.1 (10.85)		10.26 (9.2)		16.88 (9.16)		27.49 (6.52)		5.66 (5.49)		1.53 (2.52)		1.95 (2.63)	
Place to relax at home[a]		-7.16***		-7.18***		-9.99***		6.15***		-3.98***		-4.01***		-1.62
Yes	15.17 (10.58)		9.55 (8.8)		15.87 (8.91)		28.02 (6.37)		5.43 (6.41)		1.44 (2.4)		1.96 (2.6)	
No	18.46 (11.08)		12.47 (9.95)		19.84 (9.38)		26.31 (6.57)		6.59 (7.08)		1.9 (2.84)		2.14 (3)	

Notes: [a]= Means comparison conducted through Students' *t* test; [b]= Means comparison conducted through ANOVA. *p< .05; **p< .01; ***p< .001.

Psychological impact of the lockdown on anxiety, depression, and disordered eating in women

Structural equation modelling was applied to test a model in which the psychological impact of the lockdown was related to disordered eating symptomatology, as well as anxiety and depression symptoms. The proposed model included three latent variables - psychological wellbeing, eating symptoms, and anxiety and depression symptoms - which were the result of several indicators (Figure 1). The latent variable named psychological wellbeing gathered those variables related to the lockdown and that had a direct impact on participants' wellbeing, such as self-care time, appearance concerns, health concerns, and feeling of autonomy. Self-esteem was also considered as an indicator of the psychological impact of the lockdown, being considered as a protective factor for the negative psychological impact of the lockdown. As it can be seen in Figure 1, these indicators had a positive weight into the psychological impact latent variable, since higher values in every one of these indicators were related to higher participant's wellbeing and therefore a lower impact of lockdown. It has to be noted that self-esteem had the highest regression weight into the psychological impact latent variable indicating its key role as a protective factor against the psychological impact of the lockdown. The proposed model states that the psychological impact of the lockdown has a direct effect on two other latent variables: anxiety and depression, and disordered eating symptoms, being regression weights -.959, and -.665, respectively. Therefore, a lower psychological wellbeing was directly related to higher symptomatology of anxiety, depression, and disordered eating. Regression weights of anxiety and depression indicators ranged from .790 and .852, and from .461 to .848 in the disordered symptoms latent variable. It has to be noted that dieting and bulimia and food preoccupation were the subscales that obtained the higher regression weights regarding disordered eating. This model showed a good fit to data (χ^2[41]= 402416.999, GFI= .997, CFI= .990, NFI= .990, SRMR= .055), indicating that the psychological impact of the lockdown had a direct effect on anxiety and depression, as well as in eating symptomatology.

Figure 1. Structural equation modelling relating the impact of psychological wellbeing during lockdown on anxiety, depression, and disordered eating symptoms.



DISCUSSION

The aim of this study was to explore the impact of COVID-19 and its associated lockdown on depression, anxiety, stress, self-esteem, and disordered eating in a community sample of Spanish adolescents and young people.

Significant differences were found in disordered eating between men and women, which aligns with previous literature (e.g., Elgin & Pritchard, 2006, González et al., 2018), being women those who were at a higher risk for developing an eating disorder. Moreover, men and women also differed in several sociodemographic and COVID-19 related variables, including employment situation, their relationship status, and their feeling of having a place where they could relax at home.

It is well-known that the strict isolation measures in hospitals due to COVID-19 have had a significant psychological impact on both patients and their families. Accordingly, the present study found that the vast majority of people who had suffered the loss of a loved one due to coronavirus, had not had the chance of saying goodbye to them. This should be taken into consideration as it might result in complicated grief, and new rituals for honoring death in times of coronavirus could be implemented as a mitigating strategy.

Furthermore, the results of this research indicated that around one quarter of the sample were experiencing severe or extremely severe levels of depression, anxiety, and stress. These results are in line with the ones reported by Odriozola-González et al. (2020), but they differ from the ones obtained by Wang et al. (2020) and Ozamiz-Etxebarria et al. (2020), who reported much lower levels of depression, anxiety, and stress in Chinese and Northern Spanish samples, respectively. This discrepancy could be explained by the fact that these two studies were conducted in the initial phases of the COVID-19 outbreak, when people were probably still not aware of the pandemic's scope, and lockdown measures were just being implemented, and therefore psychological distress was not as profound.

From our results, it seems clear that lockdown has had an impact on many life domains. The majority of women reported a deterioration in sleep quality, which goes in accordance with other recently published studies (Huang & Zhao, 2020). Similarly, almost half of the women indicated that their eating

habits and appearance concerns had worsened since lockdown began. Health concerns, preoccupation about one's own future, anxiety and feelings of sadness and loneliness had also worsened since the beginning of lockdown.

On the contrary, more than half of the sample reported that they were spending more time caring for themselves. As Spanish population was forced to stay at home most of the time when the data was collected, this possibly allowed people to have more time to do self-caring activities that they could not do before.

Surprisingly, a considerable proportion of women, especially the youngest ones, indicated that they were doing more physical activity at that time than before lockdown. This could be related to the fact that when participants completed the survey it was allowed to go out only to engage in individual sports activities, after several weeks of total confinement. Hence, it is possible that adolescents and young adults took advantage of that and started exercising more than they used to before the pandemic. It should also be noted that many other women indicated that they were exercising less at that time than before lockdown.

Moreover, confinement has had an impact on social relations on nearly half of the sample, in some cases improving family, friends and couple relationships, and in some other cases deteriorating them.

In accordance with other authors (e.g., Ozamiz-Etxebarria et al., 2020), the present study found that the youngest participants (generation Z) were more depressed and distressed than the older ones (generation Y or *Millennials*). In alignment with this result, 62% of students felt that there had been an increase in assignments since lockdown began. Therefore, young students might have experienced additional stress due to the need to adapt to the new online educational environment. This should be taken into consideration and, as suggested by Ozamiz-Etxebarria et al. (2020), teaching institutions might have to implement prevention and intervention programs to mitigate the emotional impact of the pandemic and its associated lockdown.

Unlike the findings reported by Cao et al. (2020), that indicated that living in urban areas was a protective factor against anxiety, the place of residence did not seem to have an impact on psychological distress in our sample. This

difference might be partly due to cultural differences, as the imbalance of resources between urban and rural areas in Spain is much less pronounced than in China.

Participants that were unemployed were more depressed, anxious, and stressed, and had a lower self-esteem, than those who had a job. This finding goes in accordance with the well-documented fact that unemployment is associated with psychological distress and feelings of worthlessness (Farré, Fasani, & Mueller, 2018), and is of paramount importance as unemployment has surged as a result of the coronavirus pandemic.

Surprisingly, women that were not sure about whether they had been infected with the virus or not were more depressed and stressed in comparison to participants who had suffered COVID-19. Similarly, women that had not been infected with coronavirus were more stressed than those who had indeed suffered the virus. One possible explanation for these findings is that people who have recovered from the virus might be less worried about the health-damaging consequences of COVID-19. Also, especially during the first weeks of the outbreak, Spain faced coronavirus-testing shortages, therefore many people did not know whether they were infected or not, which could have led to an increase in emotional distress.

It was also found that women who had suffered the loss of a close person due to COVID-19 were more distressed and showed greater eating disturbances. This goes in accordance with the literature (Bennett, Greene, & Schwartz-Barcott, 2013; Goldbacher et al., 2012; Loth, van den Berg, Eisenberg, & Neumark-Sztainer, 2008), as stressful life events have been reported to be positively associated with disordered eating behaviors, and emotional eating has been defined as eating in response to emotional cues often as a way of coping with negative emotions. In this regard, grief may affect psychological wellbeing and lead to disturbed eating.

Moreover, emotional distress and eating disturbances were more prevalent in women who considered that did not have a place at home where they could relax. This should be taken into consideration as it might suggest a higher lockdown burden for lower income families.

A structural equation model including both COVID-19-related variables and psychological measures was tested in order to analyze the multivariate relationship between these variables. Results showed that the psychological impact of the lockdown in terms of variables that were related to participants' wellbeing had a direct effect on disordered eating and emotional distress (anxiety, depression, and stress). As expected, a higher psychological impact of the lockdown-related variables and lower self-esteem were directly related to higher levels of emotional distress and disordered eating in women. Therefore, this model confirms the direct influence of lockdown-related variables into psychopathology symptoms, in terms of disordered eating, and emotional distress.

The current study has several limitations that should be noted. First, part of the results included women only, as they constituted the majority of the sample. Therefore, further research should aim at examining the impact of lockdown on men. Second, even though this research reported the prevalence of participants who did not identify within the gender binary system as recommended by Cameron and Stinson (2019), these individuals were not included in the statistical analyses that were conducted separately for men and women due to their small sample size. Third, causality cannot be assumed among variables as the study had a cross-sectional design.

It should also be taken into consideration that when the study was conducted there was greater freedom of movement in Spain compared to the initial weeks of lockdown. Hence, data collection does not correspond with the contagious peak.

In conclusion, considering that COVID-19 has triggered the largest enforced isolation in living human history, early strategies are needed in order to tackle the adverse psychological effects derived from the pandemic and its associated confinement. Furthermore, it has been suggested that factors such as inadequate supplies and information, boredom, stigma and financial loss can have a negative psychological effect, and young people, individuals from disadvantaged backgrounds, and people with lower educational qualifications seem to be especially vulnerable (Brooks et al., 2020). Therefore,

all these aspects should be carefully considered when designing plans and programs to help mitigate the psychological consequences.

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STUDY 3

3.3. Study 3: The impact of COVID-19 lockdown on social network sites use, body image disturbances and self-esteem among adolescent and young women

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The impact of COVID-19 lockdown on social network sites use, body image disturbances and self-esteem among adolescent and young women

Helena Vall-Roqué[1], Ana Andrés[2] & Carmina Saldaña[1,3]

[1] Department of Clinical Psychology and Psychobiology, Faculty of Psychology, Universitat de Barcelona, Barcelona, Spain.

[2] Faculty of Psychology, Education Sciences and Sport, Ramon Llull University, Barcelona, Spain.

[3] Institute of Neurosciences, Universitat de Barcelona, Barcelona, Spain.

Corresponding author: Helena Vall-Roqué. Department of Clinical Psychology and Psychobiology, Faculty of Psychology, Universitat de Barcelona, Passeig Vall d'Hebron, 171, 08035 Barcelona, Spain.

Abstract

Objective: This study aimed to determine the impact of COVID-19 lockdown on social network sites (SNS) use and to explore whether SNS use is associated with body image disturbances and low self-esteem.

Methods: A total of 2601 women living in Spain aged 14–35 years completed questionnaire measures of SNS use, self-esteem, body dissatisfaction and drive for thinness. In the survey, participants were asked about their use of SNS at the moment of answering the survey and before lockdown.

Results: A statistically significant increase was found in the frequency of use of all studied SNS (Instagram, YouTube, TikTok, Twitter and Facebook) during lockdown, as well as in the number of women following appearance-focused Instagram accounts. Moreover, significant relationships were found between the frequency of Instagram use and body dissatisfaction, drive for thinness and low self-esteem in the younger age group (14–24), and between the frequency of Instagram use and drive for thinness in the older age group (25–35). Following appearance-focused accounts on Instagram was related to body dissatisfaction and drive for thinness in the younger group, and only to drive for thinness in the older group (25–35). Following appearance-focused accounts on Instagram and a higher frequency of use of Instagram significantly predicted higher levels of drive for thinness.

Conclusion: These results suggest that lockdown has had an impact on SNS use, and this might be linked to increased drive for thinness and eating disorder risk among adolescent and young women.

Keywords

COVID-19, social networks, body image, self-esteem, eating disorders.

INTRODUCTION

The novel coronavirus disease 2019 (COVID-19) pandemic has posed a significant threat to the global health system worldwide. As stated by the United Nations' report, "although the COVID-19 crisis is, in the first instance, a physical health crisis, it has the seeds of a major mental health crisis as well, if action is not taken" (United Nations 2020).

Several research articles have reported that the COVID-19 outbreak and its associated quarantine might be linked to anxiety, depression, stress, post-traumatic stress disorder and disturbed sleep (e.g. Cao et al. 2020; Liang et al. 2020; Rajkumar 2020). Furthermore, it has been suggested that the pandemic could also have a significant impact on eating disorder risk and symptoms (Rodgers et al. 2020).

The current study was conducted in Spain, which was the third country in the world with more deaths recorded per 100,000 inhabitants when the data for this research was collected, in mid-May (John Hopkins Coronavirus Resource Center 2020). On 14 March, the entire country was placed in strict lockdown, and the Spanish population had to remain at home for at least 6 weeks. On 28 April, the Spanish government announced a lockdown exit strategy for the country, as the number of new cases and deaths in the country showed a decreasing trend. This de-escalation plan started 10 days before the data for this research was collected.

Given the mandated social isolation, the use of social media might have increased during lockdown (Cellini, Canale, Mioni and Costa 2020), and it has been suggested that the use of social networks, especially an appearance-focused use, is linked to body dissatisfaction (Cohen, Newton-John and Slater 2017; Fardouly and Vartanian 2016; Holland and Tiggemann 2016; Sherlock and Wagstaff 2019) and low self-esteem (Liu and Baumeister 2016; Woods and Scott 2016).

Taking into consideration that social networks play a crucial role in adolescents' and young individuals' lives (Gioia, Griffiths and Boursier 2020; O'Keeffe and Clarke-Pearson 2011), and that body image problems and low self-esteem are more prevalent among girls than boys (O'Dea and Caputi 2001; Magee and Upenieks 2019), special attention should be paid to these

groups. Furthermore, women and young individuals are two of the most vulnerable groups to the negative psychosocial effects of COVID-19 (Ozamiz-Etxebarria, Dosil-Santamaria, Picaza-Gorrochategui and Idoiaga-Mondragon 2020; Sun et al. 2020; Wang et al. 2020).

The aim of the present study was to examine the impact of COVID-19 lockdown on social network sites (SNS) use and to explore whether SNS use was associated with body image disturbances and low self-esteem in adolescents and young women. We hypothesized that there would have been a significant increase in the frequency of use of SNS and in the amount of people following appearance-focused Instagram accounts during lockdown, and that the frequency of use of Instagram and following appearance-focused accounts would be positively associated with body dissatisfaction, drive for thinness and low self-esteem. Finally, we theorized that following appearance-focused accounts on Instagram and a higher frequency of use of Instagram would predict higher levels of drive for thinness.

METHOD

Participants and procedure

A total of 3378 participants from the general population were recruited to participate in a web-based, cross-sectional survey. Inclusion criteria included living in Spain, being between 14 and 35 years old, and being a woman. As the creation of study subgroups was based on age ranges and the other main independent variables of the study were related to SNS usage, participants who did not report their age or did not answer SNS items were excluded from subsequent analyses (n = 261). A further 257 participants were excluded as they indicated that they did not live in Spain, and those who were younger than 14 or older than 35 (n = 128), men and participants who identified their gender as "other" (n = 129) were excluded. Furthermore, women who indicated that they were pregnant (n = 2) were also excluded from subsequent analyses (due to the changes often experienced in body image and self-esteem during pregnancy; Fuller-Tyszkiewicz, Skouteris, Watson and Hill 2013; Inanir, Cakmak, Nacar, Guler and Inanir 2015). This resulted in a final sample of 2601 women.

A cross-sectional and retrospective design was adopted: in the survey, participants were asked to report their use of SNS at the time of answering the survey and before lockdown. Data were collected from the period of May 12 until May 17, 2020. At that time, Spanish population were allowed to engage in individual sport activities for a limited time per day. In 26 provinces (comprising 51% of the Spanish population), from the 11th of May on it was also permitted to visit friends and family living in the same province, still with social distancing measures.

Participants were recruited through various social media platforms (Twitter, Instagram and Facebook) and through personal contacts of the research team. Study advertisements outlined that the researchers were interested in understanding the impact of COVID-19 and its associated lockdown on SNS use and mental health.

Respondents to study advertisements clicked on a web link that took them to an online secure internet-based website. Participants gave their informed consent before completing questionnaire measures, and they did not receive compensation for their participation.

The study was approved by the University's Bioethics Commission. Parental consent was not requested as the Spanish law states that it is only required for individuals under 14 years old for this type of studies (Organic Law 3/2018 for Data Protection and Guarantee of Digital Rights, articles 6 and 7).

Measures

Sociodemographic information. Participants self-reported their age, gender, place of residence, employment situation, relationship status, height, and weight. Height and weight measures were used to calculate body mass index (BMI).

COVID-19 and lockdown-related information. Participants indicated whether they or a close person had contracted COVID-19, and if they had a loved one that had deceased due to COVID-19. Participants also reported if they felt they had a place in their homes where they could relax. All this information was assessed using closed-ended questions.

SNS use. Likert-scale self-report items assessed the frequency of use of Instagram, Youtube, TikTok, Twitter and Facebook at the time of answering the survey and before lockdown (*I do not have an account on this social network*, *Never/Almost never*, *Less than 1 hour/day*, *1-2 hours/day*, *2-3 hours/day*, *3-4 hours/day*, *More than 4 hours/day*). For each social network, answers were grouped into categories based on whether participants exhibited a low, moderate, or high use: *Spends less than 1h/day*, *spends between 1h-2h/day*, and *spends more than 2h/day*. The same categories for each SNS were established for the frequency of use of social networks before lockdown.

Two multiple answer questions queried which type of accounts individuals followed on Instagram at the time of completing the survey and before lockdown, provided that they had an Instagram account. Answers to these questions were recategorized into "following appearance-focused accounts" and "not following appearance-focused accounts". Participants who indicated that they followed fashion, clothing brands, weight-loss tips or diets, beauty, or fitness accounts were included in the first category. Those who did not follow any of the mentioned accounts were included in the second group. Individuals who did not have an Instagram account were not included in any of the categories.

Eating Disorders Inventory-3 (EDI-3; Garner 2004; adapted to Spanish by Elosua, López-Jáuregui and Sánchez-Sánchez, 2010). The Drive for Thinness and Body Dissatisfaction subscales were applied. The former comprises 7 items that assess the desire to be thinner, concern with dieting, preoccupation with weight and fear of weight gain. The latter consists of 10 items that assess discontentment with the overall shape and with the size of those regions of the body of extraordinary concern to those with eating disorders. Responses of both subscales are rated on a 6-point Likert scale, ranging from "Never" to "Always". Both scales have an adequate internal consistency: drive for thinness has been reported to have alpha values of .92 in Spanish women, and body dissatisfaction's alpha values were .90 in Spanish women (Elosua et al. 2010).

Rosenberg Self-Esteem Scale (RSES; Rosenberg 1965; adapted to Spanish by Martín-Albo, Núñez, Navarro and Grijalvo 2007). The RSES is a widely used 10-item questionnaire that assesses global self-esteem and general feelings of self-worth with a 4-point Likert scale, ranging from "Strongly disagree" to "Strongly agree". Higher scores indicate higher self-esteem. The scale has been shown to have a one-factor structure and satisfactory levels of internal consistency (Cronbach's alpha of .85) in Spanish samples (Martín Albo et al. 2007).

Data analysis

Participants were divided into two age categories: generation Z, which comprised individuals that were aged from 14 to 24, and generation Y/*Millennials*, which included participants that were between 25 and 35 years old. Generational cohorts were established based on Francis and Hoefel (2018) and Duffy, Shrimpton, Clemence, Thomas, Whyte-Smith and Abboud (2018).

Data was analyzed using SPSS version 25. Descriptive statistics (frequency, percentages, mean, and standard deviation) were used for assessing the sociodemographic and COVID-19-related characteristics of the sample, the SNS use variables, and the mental health status of participants. Chi-square tests of independence were performed to examine the relation between age groups and categorical variables, and Student's *t* tests were conducted to explore the relationship between age groups and the scores in psychological variables. *t*-tests were also performed to examine whether following appearance-focused accounts on Instagram was significantly associated with any of the psychological variables.

One-way ANOVAs were carried out to assess whether the frequency of use of Instagram during lockdown was significantly associated with each psychological variable. If Levene's test of homogeneity of variance was violated, the Brown-Forsyth statistic was reported. Statistically significant effects from the one-way ANOVAs were followed up by Tukey post hoc tests when data met the homogeneity of variances assumption, and by Games-Howell post hoc tests when homogeneity of variances' assumption was violated.

Hedges' *g* (Hedges and Olkin 1985) was calculated after carrying out Student's *t* tests and ANOVAs to measure the effect sizes of statistically significant results. Cohen's criteria (Cohen 1988) was used to interpret effect sizes, where 0.2, 0.5 and 0.8 represented small, medium, and large effects, respectively.

A Wilcoxon signed rank test was conducted to assess the differences in frequency of SNS use before and during lockdown, and a McNemar test was carried out to explore the differences in the type of accounts followed on Instagram (appearance-focused or not) before and during lockdown.

Finally, a hierarchical multiple regression analysis was performed to evaluate whether a high frequency of use of SNS and following appearance-focused accounts on Instagram were able to predict drive for thinness, controlling for age, BMI, and COVID-19-related variables. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, homoscedasticity, and multicollinearity. Multicollinearity was deemed to be a concern if the variance inflation factor (VIF) coefficient was greater than 10 or tolerance values were less than 0.10 (Belsley, Kuh and Welsch 1980; Hair, Black, Babin and Anderson 2010).

RESULTS

Descriptive statistics of the sample

Participants ranged in age from 14 to 35, with a mean age of 24.05 years (SD = 5.04). 1620 women (62.3%) were aged between 14 and 24, and 981 (37.7%) between 25 and 35. Mean sample BMI was 23.79 kg/m^2 (SD = 5.07). The frequencies and percentages of the other sociodemographic and COVID-19 and lockdown-related variables are reported in table 1. As shown in the table, statistically significant differences were found between age groups in the following variables: employment situation, relationship status, contraction of COVID-19, and feeling of having a place to relax at home.

Table 1. Participants' sociodemographic, COVID-19 and lockdown-related descriptive statistics divided by age group.

	Aged 14-24 No. (%)	Aged 25-35 No. (%)	Total No. (%)	χ^2
Place of residence				χ^2 (1, *n*=2601) = 0.26
City or town in Spain	994 (61.4)	592 (60.3)	1586 (61)	
Rural area in Spain	626 (38.6)	389 (39.7)	1015 (39)	
Employment status				χ^2 (4, *n*=2601) = 797.06***
Not working (e.g. student)	1176 (72.6)	160 (16.3)	1336 (51.4)	
Employee / Self-employed	229 (14.1)	512 (52.2)	741 (28.5)	
Temporary leave	13 (0.8)	43 (4.4)	56 (2.2)	
Unemployed	119 (7.3)	149 (15.2)	268 (10.3)	
Other	83 (5.1)	117 (11.9)	200 (7.7)	
Current relationship status				χ^2 (2, *n*=2601) = 235.22***
Single	860 (53.1)	222 (22.6)	1082 (41.6)	
In a relationship / Married	747 (46.1)	752 (76.7)	1499 (57.6)	
Other	13 (0.8)	7 (0.7)	20 (0.8)	
Contracted COVID-19				χ^2 (2, *n*=2601) = 12.52**
Yes	36 (2.2)	34 (3.5)	70 (2.7)	
No	1209 (74.6)	672 (68.5)	1881 (72.3)	
Not sure	375 (23.2)	275 (28)	650 (25)	
Loved one infected with COVID-19				χ^2 (2, *n*=2601) = 1.43
Yes	602 (37.2)	386 (39.3)	988 (38)	
No	820 (50.6)	474 (48.3)	1294 (49.8)	
Not sure	198 (12.2)	121 (12.3)	319 (12.3)	
Loved one deceased due to COVID-19				χ^2 (1, *n*=2601) = 0.25
Yes	178 (11)	114 (11.6)	292 (11.2)	
No	1442 (89)	867 (88.4)	2309 (88.8)	
Own space to relax at home				χ^2 (1, *n*=2601) = 61.49***
Yes	1223 (75.5)	598 (61)	1821 (70)	
No	397 (24.5)	383 (39)	780 (30)	

*Note. Percentages are presented per column. *p < .05; **p < .01; ***p < .001*

Psychological status of participants

Means and standard deviations of the scores in each psychological scale are shown in table 2, together with mean comparisons between age groups. Significant differences between age groups were found in self-esteem and body dissatisfaction, with small effect sizes.

Table 2. Mean scores of psychological measures and comparisons between age groups.

	Range	Aged 14-24 M (SD)	Aged 25-35 M (SD)	*t*	Hedges' *g* [95% CI]
Self-esteem	10 – 40	26.86 (6.42)	28.61 (6.43)	-6.43***	0.27 [0.19; 0.36]
Body dissatisfaction	0 – 40	16.39 (9.9)	17.38 (10.9)	-2.26*	-0.20 [-0.28; -0.11]
Drive for thinness	0 – 28	10.99 (8.56)	10.57 (8.13)	1.23	

*Note. Sample sizes differ among questionnaires as not all participants completed all measures. EDI-3 was fulfilled by 2471 women and RSES by 2357 women. *p < .05; **p < .01; ***p < .001*

Social network sites use

Statistically significant differences were found between age groups in the frequency of use of all social networks (Instagram: $\chi^2 = 24.75$, $p < .001$; Youtube: $\chi^2 = 29.94$, $p < .001$; TikTok: $\chi^2 = 39.28$, $p < .001$; Twitter: $\chi^2 = 145.46$, $p < .001$; Facebook: $\chi^2 = 66.18$, $p < .001$), with generation Z being the ones who use Instagram, Youtube, TikTok, and Twitter more frequently, and Generation Y the ones who use Facebook more often. On the other hand, the proportion of women following appearance-focused accounts on Instagram did not significantly differ between the two age groups.

Changes in the frequency of SNS use before and during lockdown

When comparing the frequency of use of SNS before lockdown and at the moment of answering the survey, a Wilcoxon Signed Rank Test revealed a statistically significant increase in frequency of use of all studied social networks: Instagram (z = -27.68, p < .001), Youtube (z = -18.68, p < .001), TikTok (z = -23.01, p < .001), Twitter (z = -17.54, p < .001), and Facebook (z = -13.01, p < .001). When assessed separately, these statistically significant results were found both for the Generation Y and the Generation Z age groups.

Changes in the type of accounts followed on Instagram before and during lockdown

A McNemar test revealed a statistically significant difference in the proportion of participants following appearance-focused accounts on Instagram across the two self-reported time periods (χ^2 = 42.15, p < .001), indicating that there was a statistically significant increase in the amount of women following appearance-centered accounts during lockdown compared to before lockdown. When assessed separately, these statistically significant differences were found for both age groups.

Relationship between the use of SNS and self-esteem, body dissatisfaction and drive for thinness

Frequency of Instagram use and psychological variables

One-way ANOVA results are shown in table 3. Frequency of Instagram use was significantly related to self-esteem, body dissatisfaction and drive for thinness in the younger age group. Post-hoc analyses indicated that participants who spent more than two hours per day using Instagram had significantly higher levels of body dissatisfaction and drive for thinness, and significantly lower levels of self-esteem, compared to those who reported using Instagram between one and two hours per day.

Regarding the sample aged 25-35, the frequency of Instagram use was significantly associated with drive for thinness. Post-hoc analyses revealed

that those who used Instagram for more than two hours per day exhibited significantly higher levels of drive for thinness than those who reported using Instagram less than one hour per day.

As shown in table 3, effect sizes were found to be small.

Following of appearance-focused accounts on Instagram and psychological measures

As reported in table 4, participants that were aged between 14 and 24 years old who followed appearance-centered Instagram accounts had significantly higher scores in body dissatisfaction and drive for thinness compared to those who reported to follow other types of accounts on Instagram. Regarding the *Millennials* age group, these statistically significant differences depending on the accounts followed on Instagram were only found for drive for thinness. Effect sizes were small.

Table 3. Mean comparisons in psychological measures according to the frequency of use of Instagram during lockdown.

	Aged 14-24				Aged 25-35			
	Less than 1h/day M (SD)	1h – 2h/day M (SD)	More than 2h/day M (SD)	ANOVA Hedges' *g* [95% CI]	Less than 1h/day M (SD)	1h – 2h/day M (SD)	More than 2h/day M (SD)	ANOVA Hedges' *g* [95% CI]
Self-esteem	26.44 (6.9)	27.49 (6.3)	26.56 (6.38)	$F(2, 1454)=3.71$* g = 0.15 [0.03; 0.26]	29.29 (6.89)	28.89 (6.27)	28.11 (6.37)	$F(2, 878)=2.33$
Body dissatisfaction	16.72 (10.14)	15.47 (9.66)	16.9 (9.98)	$F(2, 1520)=3.54$* g = -0.15 [-0.25; -0.04]	16.47 (10.94)	17.03 (11.11)	18.06 (10.67)	$F(2, 926)=1.54$
Drive for thinness	10.48 (8.24)	10.16 (8.31)	11.68 (8.75)	$F_{BF}(2, 1520)=5.71$** g = -0.18 [-0.29; -0.07]	9.6 (7.74)	10.06 (8.05)	11.39 (8.3)	$F(2, 926)=3.98$* g = -0.22 [-0.40; -0.04]

*Note. ^{BF} = Brown-Forsythe. *p < .05; **p < .01; ***p < .001*

Table 4. Mean comparisons in psychological measures according to the type of accounts followed on Instagram during lockdown.

	Aged 14-24			Aged 25-35		
	Following appearance accounts M (SD)	Not following appearance accounts M (SD)	*t* Hedges' *g* [95% CI]	Following appearance accounts M (SD)	Not following appearance accounts M (SD)	*t* Hedges' *g* [95% CI]
Self-esteem	27.01 (6.29)	26.6 (6.73)	-1.1	28.58 (6.42)	28.68 (6.47)	0.22
Body dissatisfaction	16.81 (9.95)	15.36 (9.75)	-2.65** *g* = 0.15 [0.04; 0.26]	17.72 (10.76)	16.67 (11.13)	-1.37
Drive for thinness	11.76 (8.61)	9.24 (8.21)	-5.43*** *g* = 0.30 [0.19; 0.41]	11.42 (8.28)	8.81 (7.55)	-4.77*** *g* = 0.32 [0.19; 0.46]

*Note. *p < .05; **p < .01; ***p < .001*

Social network sites use as a predictor of drive for thinness

Results from the hierarchical multiple regression analysis can be found in table 5. Multicollinearity was judged to not be a problem (tolerance ≥ 0.89, VIF ≤ 1.13), and the other preliminary analyses ensured no violation of the assumptions of normality, linearity, and homoscedasticity.

Results from step 1 in the regression analysis indicated that age and BMI were significant predictors of drive for thinness (age: β = -0.10, $p < .001$; BMI: β = 0.34, $p < .001$), explaining 10.8% of its variance. After controlling for these two variables, COVID-19 and lockdown-related measures accounted for 0.4% of the variance in drive for thinness, and the total variance explained by the model was 11.2% ($F(6, 2453) = 51.68$, $p < .001$). Only the variable 'having a place to relax at home' significantly predicted drive for thinness (β = 0.06, $p < .01$). In step 3, the regression analyses revealed that both the frequency of use of Instagram and following appearance-focused accounts on Instagram were significant predictors of drive for thinness (respectively, β = 0.06, $p < .01$, and β = 0.13, $p < .001$). These variables explained an additional 2.3% of the variance in drive for

thinness, and the total variance explained by the model as a whole was 13.5% ($F(8, 2451) = 47.85$, $p < .001$).

Following appearance-focused accounts on Instagram was the second strongest predictor of drive for thinness, as it was observed when the standardized regression coefficients in step 3 of the regression analysis were compared.

Table 5. Hierarchical multiple regression analysis predicting drive for thinness.

	Drive for thinness		
Step and predictor	**R^2**	**Δ F**	**β**
Step 1	0.11	148.4***	
Age			-0.10***
BMI			0.34***
Step 2	0.11	3.07*	
Age			-0.11***
BMI			0.34***
Contracted COVID-19			0.04
Loved one contracted COVID-19			0.003
Loved one deceased by COVID-19			-0.01
Having own space to relax			0.06**
Step 3	0.14	32.39***	
Age			-0.10***
BMI			0.34***
Contracted COVID-19			0.03
Loved one contracted COVID-19			0.01
Loved one deceased by COVID-19			-0.01
Having own space to relax			0.06**
Frequency of use of Instagram			0.06**
Following appearance-focused accounts on Instagram			0.13***

*Note. BMI = Body Mass Index. *p < .05; **p < .01; ***p < .001*

DISCUSSION

The aim of this study was to explore the impact of COVID-19 lockdown on SNS use, body image disturbances and self-esteem in a community sample of female Spanish youngsters.

Significant differences were found between age groups, not only in some of the sociodemographic characteristics but also in the frequency of use of SNS and in self-esteem and body dissatisfaction. The differences found in SNS use go in accordance with other studies (e.g. Adobe 2019), which have revealed that Facebook has experienced a decline in usage among generation Z, while other SNS like Instagram and YouTube have taken the lead. Regarding the psychological variables, it has been stated that self-esteem follows an inverted U-shape over the life course (Orth, Erol and Luciano 2018), which aligns with the differences found in the present study. However, mixed findings have been reported regarding the relationship between body dissatisfaction and age: even though some authors have indicated that youth are increasingly dissatisfied with their bodies as their BMI increases from middle school to young adulthood (Bucchianeri, Arikian, Hannan, Eisenberg and Neumark-Sztainer 2013), others have reported that body dissatisfaction remains relatively stable across the life span (Tiggemann 2004). Hence, further research should aim at examining the differences in body dissatisfaction among age groups. Furthermore, it should be considered that the differences found between the two age groups might have had an impact on the results.

As hypothesized, there was a significant increase in the frequency of use of SNS and in the number of girls following appearance-centered accounts on Instagram during lockdown. This might be a consequence of forced social distancing, and aligns with KalaGato's report (KalaGato 2020), which concludes that average time spent on social media surged during lockdown. This increase may have allowed users to widen the topics range of the followed accounts on Instagram.

The frequency of use of Instagram was positively associated with body dissatisfaction, drive for thinness and low self-esteem among Generation Z participants. In the Generation Y group, the frequency of use of Instagram was only associated with drive for thinness. However, effect sizes were very small,

hence these results should be interpreted with caution. Following appearance-focused accounts on Instagram was found to be associated with drive for thinness in both age groups, and the effect size in this case was stronger, even though still small. Our hypothesis stating that following appearance-focused accounts on Instagram and a higher frequency of use of Instagram would predict higher levels of drive for thinness was confirmed. These results align with previously published literature (Cohen et al. 2017; Holland and Tiggemann 2016; Sherlock and Wagstaff 2019). Taking into consideration the lockdown's associated changes in SNS use stated above, these results might have significant implications, as they might indicate that the detrimental effects of SNS could have been exacerbated during the pandemic, and COVID-19 might be linked to increased drive for thinness and risk for eating disorder behaviors relative to media effects, as suggested by Rodgers et al. (2020).

The current study has several limitations that should be noted. First, only women were included in the study. Further research should aim at examining the impact of lockdown on men and individuals who do not identify within the gender binary system. Second, as participants' recruitment was conducted online, the sample of the present study is not representative of the Spanish population. Third, causality cannot be assumed among variables as the study had a cross-sectional design. Even though the retrospective design has been found to be a valuable alternative to traditional pretest-posttest design as it addresses many of its validity concerns and mitigates the response shift bias that seems ubiquitous in the traditional approach, criticisms of the retrospective design include memory-related problems, impression management and response bias (Little et al. 2020).

A bidirectional relationship of body image disturbance and self-esteem with SNS usage is also possible: particularly women with prior body image disturbance might have used Instagram and other SNS more often during COVID-19 as they had more time to ruminate and to engage in the usage. Furthermore, other sources of reassurance where missing during the lockdown, which may have enhanced appearance-related comparisons via SNS in a vulnerable group.

It should also be taken into consideration that when the study was conducted there was greater freedom of movement in Spain compared to the initial weeks of lockdown. Hence, data collection does not correspond with the contagious peak.

In conclusion, COVID-19 lockdown seems to have had an impact on SNS use, which might involve an increase in body image disturbances among adolescents and young women. Further research should aim at examining the impact of the pandemic on eating disorders, and early strategies should be implemented in order to mitigate the adverse effects of COVID-19.

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STUDY 4

3.4. Study 4: Women's body dissatisfaction, physical appearance comparisons, and Instagram use throughout the COVID-19 pandemic: A longitudinal study

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Women's body dissatisfaction, physical appearance comparisons, and Instagram use throughout the COVID-19 pandemic: A longitudinal study

Helena Vall-Roqué[1], Ana Andrés[2], Himar González-Pacheco[3] & Carmina Saldaña[1,4]

[1] Department of Clinical Psychology and Psychobiology, Faculty of Psychology, Universitat de Barcelona, Barcelona, Spain.

[2] Faculty of Psychology, Education Sciences and Sport, Ramon Llull University, Barcelona, Spain.

[3] Canary Islands Health Research Institute Foundation, Tenerife, Spain.

[4] Institute of Neurosciences, Universitat de Barcelona, Barcelona, Spain.

Corresponding author: Helena Vall-Roqué. Department of Clinical Psychology and Psychobiology, Faculty of Psychology, Universitat de Barcelona, Passeig Vall d'Hebron, 171, 08035 Barcelona, Spain.

Abstract

Objective: This study aimed to determine the evolution of Instagram use, body dissatisfaction and physical appearance comparisons throughout the coronavirus disease-2019 (COVID-19) pandemic, and to explore whether there was a relationship between the changes in Instagram use throughout the pandemic and body dissatisfaction and physical appearance comparisons.

Method: A total of 272 Spanish women (16–70 years old) were followed-up across four waves of assessment between November 2019 (before the pandemic started) and July 2021. Body dissatisfaction, social appearance comparisons, and Instagram use were assessed using the Eating Disorders Inventory-3, the Physical Appearance Comparison Scale-Revised, and an ad hoc questionnaire for Instagram use, respectively.

Results: No statistically significant changes were found in the frequency of Instagram use, nor on the proportion of women following appearance-focused accounts on Instagram, among the data collection periods. Body dissatisfaction significantly increased from T1 to T4, and physical appearance comparisons significantly increased from T1 to T2, T3, and T4. These increases were not found to be significant for those with eating disorder risk. No

significant differences were found in body dissatisfaction and physical appearance comparisons depending on whether participants' frequency of Instagram use had changed or remained the same, or whether they had started/stopped/continued following appearance-focused accounts on Instagram during the pandemic.

Discussion: Women's body dissatisfaction and physical appearance comparisons seem to have increased throughout the pandemic. The experiences of individuals with eating disorder risk throughout the pandemic, and the relationship between the pandemic and Instagram use, might be complex and need further research.

Public significance

This study suggests that women's body dissatisfaction and physical appearance comparisons have increased throughout the COVID-19 pandemic. However, this increase might not be as clear for those who had eating disorder risk before the pandemic. Instagram frequency of use, and the percentage of women following appearance-focused accounts on Instagram, do not seem to have significantly increased. More research is needed to explore the impact of the pandemic.

Keywords

Appearance comparison, body dissatisfaction, body image, COVID-19, eating disorders, Instagram, longitudinal, social networks.

INTRODUCTION

The emergence of the highly infectious coronavirus disease-2019 (COVID-19) has posed a significant threat to global health. The rapid spread of the virus across the world resulted in several governments implementing drastic health measures, including lockdowns, physical distancing, closure of nonessential services and travel restrictions (Castex, Dechter, & Lorca, 2021).

In Spain, on 14 March 2020, a state of emergency was declared, placing the entire country in lockdown. All nonessential work activity was suspended, and the population was mandated to remain at home. After the initial six weeks, restrictions were gradually lifted. However, some health and social measures lasted for more than one year or are still in place at the time of writing this article (e.g., wearing a face mask in some indoor spaces and public transport). Six waves of coronavirus infections have been reported in Spain since the beginning of the pandemic until May 2022.

Since the outbreak of the pandemic, several researchers and clinicians have expressed concern about its impact on mental health (World Health Organization Regional Office for Europe, 2022). It has been suggested that the pandemic increased the prevalence of mental health problems such as depression, anxiety, distress and insomnia (Jin et al., 2021; Wu et al., 2021).

Eating habits, appearance concerns, eating disorder risk and disordered eating might have also worsened with the pandemic (e.g., Linardon et al., 2022; Robertson et al., 2021; Touyz, Lacey, & Hay, 2020; Vall-Roqué, Andrés, & Saldaña, 2021a; Weissman, Bauer, & Thomas, 2020). According to a recent systematic review (Schneider et al., 2022), several studies show a negative influence of the pandemic on body image and disordered eating, but conversely, other studies report positive outcomes of the COVID-19 pandemic, including reduction in eating disorder symptomatology, more time to reflect on recovery and engage in self-care, greater motivation to recover, and more time to connect with family. These positive outcomes might be related with the socioeconomic status of participants, reflecting that those with higher social privilege have incurred fewer financial pressures, and this might have facilitated engagement with self-care, recovery strategies, and social support (Schneider et al., 2022).

According to Rodgers et al. (2020), a pathway by which the current pandemic could increase eating disorders risk and symptoms is through an increased consumption of media (particularly social media) due to social distancing measures. This would happen through increased exposure to harmful eating and appearance-related content, as well as more general stressful or traumatic world events. In this regard, in a recent study, it was found that there was a significant increase in the frequency of use of social network sites (SNS) and in the number of women following appearance-focused accounts on Instagram during lockdown (Vall-Roqué, Andrés, & Saldaña, 2021b). Taking into consideration that the use of social networks, especially an appearance-focused use, is linked to body dissatisfaction (Fardouly & Vartanian 2016; Holland & Tiggemann 2016; Sherlock & Wagstaff 2019), an increase in the (appearance-focused) use of SNS during the pandemic could have led to an increase in body dissatisfaction. Furthermore, according to the tripartite influence model (Thompson et al., 1999), there are three primary influence variables that contribute to the development of body image disturbances: peers, parents and media. In this sense, it has been stated that the tendency to engage in physical appearance comparisons plays a mediating role in the link between SNS use and body dissatisfaction (Fioravanti et al., 2022). Therefore, an increase in SNS use throughout the pandemic could be related to an increase in (media-related) appearance comparisons. Also, considering that during the lockdown period people were presumably not engaging in socialising and could not compare themselves in-person with their peers, they might have increased their comparisons on social media, and it is known that social media comparisons tend to be focused on the beauty ideal and can be particularly harmful (Fardouly, Pinkus, & Vartanian, 2017), which might have led to increased body dissatisfaction. However, it could also be argued that, as during lockdown restrictions it was not allowed to engage in activities that often facilitate the appearance ideal social media self-presentation, the appearance focus use of SNS might have been tempered.

It should be noted that the vast majority of research that has been published examining the impact of the pandemic on body image-related variables or SNS use in community samples has used cross-sectional designs, and there is limited research using experimental and longitudinal designs. The findings of

the few studies that have longitudinally assessed the impact of the pandemic on body image are inconsistent: while there are studies that have found the pandemic to be associated with increased concerns about weight, shape and eating, and increased eating disorder symptomatology and screen time (e.g., Keel et al., 2020; Trott et al., 2021), others have found no differences between pre- and during/post-lockdown in eating disorder symptoms and eating disorder risk (e.g., Koenig et al., 2021; Martínez-de-Quel et al., 2021). Regarding the studies that have longitudinally examined social media use over the pandemic, an increase in SNS use during the lockdown phase of the pandemic has been consistently reported (Marciano et al., 2022). For example, Fumagalli et al. (2021) indicated that social media use increased at the beginning of the lockdown (March-April 2020), and Arend et al. (2021) found that more than 40% of their participants increased their daily time spent using social media. However, to our knowledge, it has not been longitudinally assessed whether the pandemic has been associated with an appearance-focused use of SNS.

Furthermore, to our knowledge, the possible changes in physical appearance comparisons throughout the pandemic have not been studied, and no studies have longitudinally assessed the (appearance-focused) use of Instagram throughout the pandemic. Instagram is one of the most popular social media platforms worldwide, and recent research attention has turned specifically to this social network, as it is dedicated purely to the posting and sharing of photos, and it has been linked to body dissatisfaction (Fardouly & Vartanian, 2016; Horwitz, 2021; Tiggemann & Anderberg, 2020). When the first data collection of this study was conducted, Instagram was the most widely used photo-based social network in Spain (IAB Spain, 2019; IAB Spain, 2020). Finally, only a few studies have focused on women samples. Taking into consideration that body image problems are more prevalent among women than men (Myers & Crowther, 2009; O'Dea & Caputi, 2001) and considering that women have been reported to be an especially vulnerable group to the negative psychosocial effects of COVID-19 (Ozamiz-Etxebarria et al., 2020; Sun et al. 2020; Wang et al. 2020), special attention should be paid to this population group.

This is a four-wave longitudinal study of data collection on Instagram use, body dissatisfaction and appearance comparisons in a Spanish women population. Participation was requested at four different times: the first one was some weeks before the pandemic outbreak, and the other ones took place approximately every 6 months throughout the pandemic. The objectives of this study were: (1) to determine the change in Instagram use, body dissatisfaction and physical appearance comparisons throughout the pandemic (both in the whole women sample and in two subgroups: those at risk of having an eating disorder and those without eating disorder risk), and (2) to explore whether there was a relationship between the changes in Instagram use throughout the pandemic and body dissatisfaction and physical appearance comparison tendency.

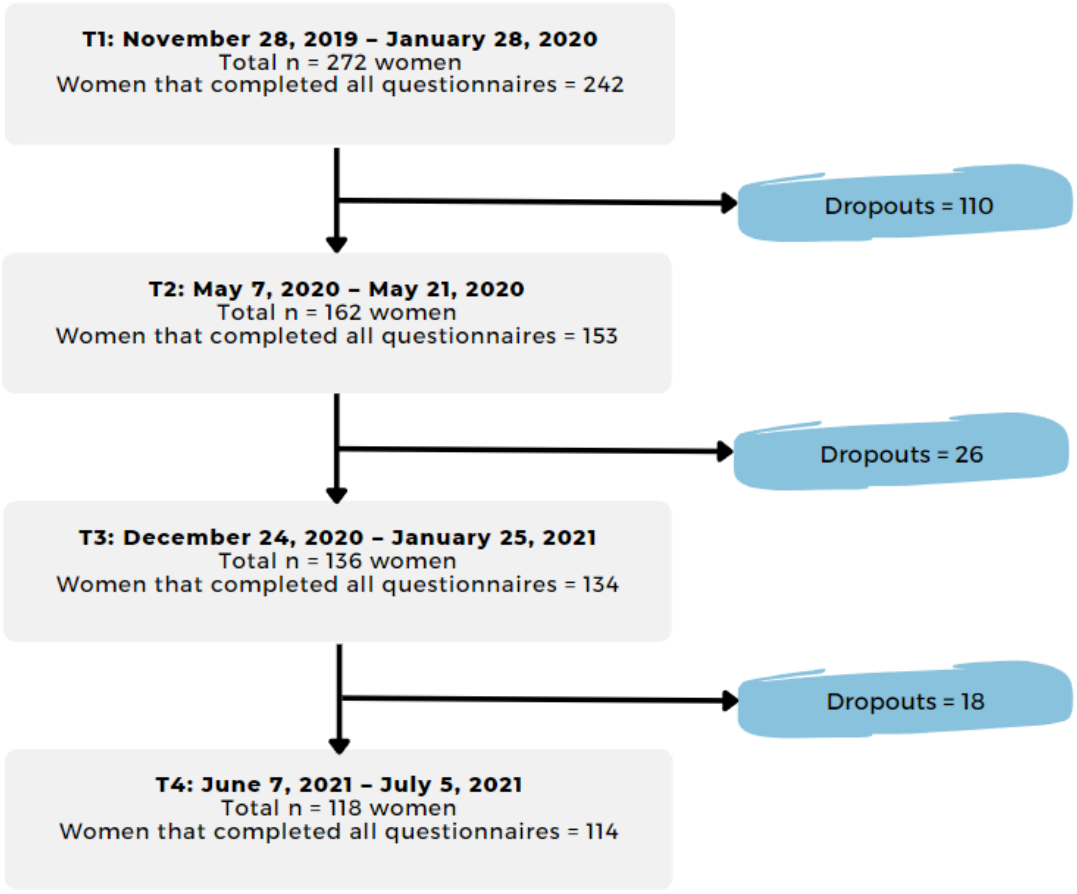
METHOD

Participants and procedure

A total of 272 Spanish women from a community sample completed questionnaire measures between November 2019 and January 2020 (period hereinafter referred to as T1 or baseline). These women were recruited in the context of a cross-sectional study that aimed to validate the Spanish version of the Physical Appearance Comparison Scale-Revised (PACS-R; Vall-Roqué, Andrés, & Saldaña, 2022) and to provide descriptive data on SNS use. The study included 1180 women aged between 16 and 70, but only 272 of them provided their email address and a code to be contacted later if necessary.

Women were contacted again in three different time periods throughout the pandemic (see Figure 1). In each time point, only women that had completed the questionnaire measures in the previous data collection period were contacted.

Figure 1. Flowchart of the participation in each data collection period.



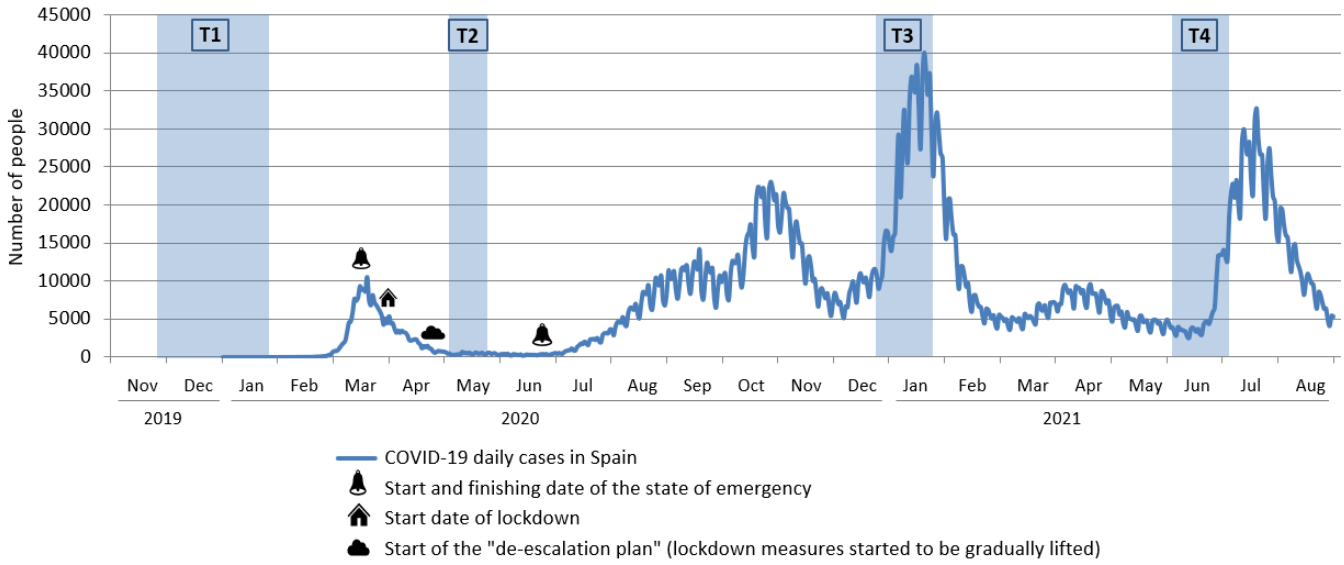
Data collection periods, together with the epidemic curve of the pandemic in Spain, are graphically shown in Figure 2. It should be noted that the number of new daily infections was underestimated in Spain, especially during the first months of the pandemic (García-García et al., 2021), therefore the number of COVID-19 cases was higher than what is shown in the figure when the second data collection took place (T2).

At the beginning of the lockdown period, all Spanish population was mandated to remain in their residences except to go to work, purchase food and medicines, or attend emergencies. On March 28, 2020, the Spanish government suspended all non-essential activity as well, therefore all non-essential workers had to remain at home. Workers in some non-essential sectors who could not work remotely (e.g., industry and construction) were permitted to return to work on April 13, when the number of new cases and deaths in the country started to show a decreasing trend. On April 26, children under 14 were allowed to go out on short walks with their parents or other

adults living in the same household. Two days later, the Spanish government announced a four-phase lockdown exit strategy for the country. This plan was divided into four phases (numbered 0 to 3), which were gradually implemented from May 2 until June 22, according to the epidemiological situation of each province. Phase 0 allowed Spanish population to engage in individual sport activities, including going for a walk, for one hour a day. In phase 1, individuals were allowed to visit friends and family in the same province, still with social distancing measures. Small businesses, religious sites, hotels and terraces started to re-open under strict safety conditions. Phase 2 allowed theatres, museums, indoor restaurants and bars to open with limited capacity. In phase 3, all shops were back in business (with a maximum capacity of 50%), and meetings and conferences were allowed again (La Moncloa, 2020).

In the third and fourth data collection periods (T3 and T4), no complete lockdown was in place. However, in T3, the third wave of COVID-19 was in full swing in Spain, and several restrictions were introduced: although these differed depending on the region of Spain, they included a night-time curfew, a reduced maximum occupancy for restaurants, businesses and gatherings, and mobility restrictions. These restrictions caused great controversy because they coincided with New Year's festive season and therefore interfered with family gatherings and other celebrations. In T4, restrictions were relaxed but still included a maximum capacity for gatherings and limitations in the capacity and opening hours of retail, among others.

Figure 2. Time periods of data collection within the epidemic curve of the pandemic in Spain.



Note: Data extracted from https://cnecovid.isciii.es/covid19/#ccaa

Inclusion criteria for participating in the initial study (which was conducted before the pandemic started) included living in Spain, being between 16 and 70 years old, and being a woman. Participants were recruited through various social media platforms (Twitter, Instagram and Facebook) and through personal contacts of the research team. All measures were administered online through a secure internet-based website. Participation was voluntary, and participants gave their informed consent before completing questionnaire measures. Participants did not receive compensation for their participation. The study was approved by the University of Barcelona's Bioethics Commission. Parental consent was not requested as the Spanish law states that it is only required for individuals under 14 years old for this type of studies (Organic Law 3/2018 for Data Protection and Guarantee of Digital Rights, articles 6 and 7).

Measures

Sociodemographic data. Information on age, gender, place of birth, place of residence, employment situation, average gross annual income, marital status, household members, height and weight was systematically collected. Height and weight measures were used to calculate BMI. Gender and educational level were only asked at T1.

COVID-19 and lockdown-related information. In the second, third and fourth waves, participants indicated whether themselves or a close person had contracted COVID-19, and if they had a loved one that had deceased due to COVID-19. This information was assessed using closed-ended questions.

Eating Disorders Inventory-3 (EDI-3; Garner, 2004; adapted to Spanish by (Elosua et al., 2010)). The Body Dissatisfaction subscale was used. This subscale consists of 10 items that assess discontentment with the overall shape and with the size of those regions of the body of extraordinary concern to those with eating disorders. Responses are rated on a 6-point Likert scale, ranging from "Never" to "Always" (scores range: 0-40). The scale has an adequate internal consistency, with reported alpha values of .90 in Spanish women (Elosua et al., 2010). In this study, the alpha value for the Body Dissatisfaction subscale was .89 at all measurement waves.

Physical Appearance Comparison Scale-Revised (PACS-R; Schaefer & Thompson, 2014; adapted to Spanish by Vall-Roqué, Andrés, & Saldaña, 2022). The PACS-R is an 11-item questionnaire that measures the tendency to compare one's physical appearance to others in a broad array of social settings. Responses are rated on a 5-point Likert-type scale ranging from "Never" to "Always". Higher scores indicate higher levels of general appearance comparison (scores range: 0-4). Psychometric evaluations of the Spanish version of the PACS-R indicate that the questionnaire has a single factor structure, and excellent internal consistency (Cronbach's alpha of .97) and convergent validity in Spanish women (Vall-Roqué, Andrés, & Saldaña, 2022). In this study, the alpha values for the PACS-R were .97, .98, .97 and .97 at baseline, T2, T3 and T4, respectively.

Eating Attitudes Test-26 (EAT-26**;** (Garner et al., 1982); adapted to Spanish by (Castro et al., 1991). The EAT-26 is a 26-item self-report questionnaire that

measures disordered eating behaviour and attitudes, and it is often used to identify individuals who might be at risk for an eating disorder. Items are presented in a 6-point Likert scale ranging from “Never” to “Always”, and higher scores indicate higher levels of eating disturbances. It has three subscales: dieting, bulimia and food preoccupation, and oral control. The questionnaire has been reported to have adequate psychometric properties, and the alpha reliability coefficient in a Spanish sample was .93 (Castro et al., 1991). In this research, the alpha values for the EAT-26 were .93, .92, .93 and .94 at baseline, T2, T3 and T4, respectively.

The EAT-26 was only used to divide the sample between those at risk of having an eating disorder (total score ≥ 20) and those without eating disorder risk (total score < 20).

Instagram use. A Likert-scale self-report item assessed the frequency of Instagram use in each time point (*I do not have an Instagram account*, *Never/Almost never*, *Less than 1 hour/day*, *1-2 hours/day*, *2-3 hours/day*, *3-4 hours/day*, *More than 4 hours/day*).

A multiple answer question queried which type of accounts individuals followed on Instagram (only applicable to those participants who reported having an Instagram account) in each wave of data collection. Participants who indicated that they followed fashion, clothing brands, weight-loss tips or diets, beauty, or fitness accounts were included in the "following appearance-focused accounts" group, whereas those who did not follow any of the mentioned accounts were included in the "not following appearance-focused accounts” group.

Moreover, three groups of participants were created according to whether their frequency of Instagram use had increased, remained the same or decreased during the pandemic (from T1 to T2, from T1 to T3 and from T1 to T4). Similarly, participants were categorized into three different groups depending on whether they had started following appearance-focused accounts on Instagram during the pandemic, they had stopped following appearance-focused accounts, or they had continued following or not following appearance-focused accounts.

Data analysis

Data was analyzed using SPSS version 25 and STATA 15.0 software.

Descriptive statistics (frequency and percentages for categorical variables, mean and standard deviation (SD) for continuous variables) were used for assessing the sociodemographic and COVID-19-related characteristics of the sample, the Instagram use variables, and the psychological variables. Cochran's Q tests, Friedman tests, marginal homogeneity tests, and repeated-measures ANOVAs were conducted to explore whether there were significant differences in the sociodemographic and COVID-19 variables among the four data collection waves. Cochran's Q tests were used to determine if there were differences on dichotomous variables between three or more related groups. Friedman tests were used to examine if there were differences between groups when the variable being measured was ordinal. Marginal homogeneity tests were used to determine if there were differences on categorical non-dichotomous variables between related groups.

For the categorical variables 'frequency of Instagram use' and 'following appearance-focused Instagram accounts', the Cochran's Q test was used to explore whether there were significant differences among the four time points. Significant results were followed by Bonferroni adjustment.

Student's *t* tests were conducted to explore whether there were significant differences in body dissatisfaction and physical appearance comparisons at baseline between individuals with and without eating disorder risk. To assess the differences among time points in the psychological variables, mixed regression models with repeated measures were used, which included the psychological variables (body dissatisfaction and physical appearance comparisons) as dependent variables, adjusting for the interaction among risk of eating disorders (dichotomous variable), time as a repeated measure, and its main effects. Baseline measures (T1) were selected as the reference category. BMI and educational level were included as covariates in the model, as a previous bivariate analysis was performed between the sociodemographic / COVID-19-related characteristics and the outcome variables, and the bivariate associations with demonstrated levels of statistical significance ($p < .05$) were included in the mixed regression models. In the

models with significant or marginally significant interaction, mixed regression models were performed for each of the interaction subgroups. Participant and intercept were introduced as random factors in all models. The intraclass correlation (ICC) was obtained for each model. Time was treated as a categorical variable to allow the model to fit every possible pattern in time and not assume linear growth, considering that a disadvantage that has been reported of modeling time as a continuous variable is that the development over time of the outcome variable Y is modeled as a linear function (Twisk, 2013).

One-way ANOVAs were carried out to assess whether the changes in the frequency of Instagram use (increase, decrease or no changes) and the changes in following appearance-focused accounts on Instagram throughout the pandemic were significantly associated with body dissatisfaction and appearance comparison tendency. If Levene's test of homogeneity of variance was violated, the Brown-Forsyth statistic was used.

Hedges' *g* (Hedges and Olkin, 1985) was calculated after carrying out Student's *t*-tests and ANOVAs to measure the effect sizes of statistically significant results. Cohen's criteria (Cohen, 1988) were used to interpret effect sizes, where 0.2, 0.5 and 0.8 represented small, medium, and large effects, respectively.

Missing values were treated by means of multiple imputation procedures (White, Royston, & Wood, 2011) with results based on 100 imputed datasets (missing values from the follow-up measurements were imputed). More details on the imputation process can be found in the supporting information file.

RESULTS

Descriptive characteristics of the sample

Participants ranged in age from 16 to 70, with a mean age of 34.43 years (SD = 11.07) at baseline. Almost 70% of the sample had tertiary level education, and the mean BMI at baseline was 23.45 (SD = 4.39). Descriptive statistics of sociodemographic and COVID-19 related variables are reported in table 1. Statistically significant differences were found among measurement waves in the following variables: *age* (F (3,115) = 50148.52, $p < .001$ among all time points, being higher in each time point; Hedges' *g* [95% CI] ranged from .07 [-.12 – .27] for T1-T2, to .24 [.02 – .46] for T1-T4), *BMI* (F (3,112) = 2.85, $p = .037$, significant increase from T1 to T4, Hedges' *g* [95% CI] = .11 [.11 – .33]), *employment status* (significant increase from T2 to T4 in the proportion of participants employed (Cochran's Q, χ^2 (3) = 9.23, $p = .026$), and significant decrease from T2 to T4 in the proportion of participants unemployed (Cochran's Q, χ^2 (3) = 9.78, $p = .021$)), *household members ('living with')* (significant differences between T1 and T3 and between T2 and T3: marginal homogeneity test, $\chi^2 = 2.46$, $p = .014$ for T1-T3; $\chi^2 = 2.39$, $p = .017$ for T2-T3; in T3, the proportion of participants living with their partner increased compared to T1 or T2, and the proportion of participants living with flatmates decreased).

Statistically significant differences were found among measurement waves in all COVID-19 related variables: *COVID-19 contraction* (the proportion of participants that contracted the disease significantly increased in each follow-up after T2; marginal homogeneity test, $\chi^2 = 3.43$, $p = .001$ for T2-T3; $\chi^2 = 4.90$, $p < .001$ for T2-T4; $\chi^2 = 2.61$, $p = .009$ for T3-T4)*; loved one infected with COVID-19* (the proportion of participants that had a close person who had had the disease significantly increased in each follow-up after T2; marginal homogeneity test, $\chi^2 = 6.00$, $p < .001$ for T2-T3; $\chi^2 = 6.38$, $p < .001$ for T2-T4; $\chi^2 = 2.67$, $p = .008$ for T3-T4)*; loved one deceased due to COVID-19* (the proportion of participants that had a close person who deceased due to COVID-19 significantly increased in each follow-up after T2; Cochran's Q test, χ^2 (2) = 29.79, $p < .001$, significant differences between T2-T3 and T2-T4).

Table 1. Descriptive characteristics of participants' sociodemographic data and of COVID-19-related variables

	Baseline (n=272)	T2 (n=162)	T3 (n=136)	T4 (n=118)
Age (years), mean (SD)	34.43 (11.07)	35.22 (11.53)	36.07 (11.32)	37.13 (11.43)
BMI (kg/m²), mean (SD)	23.45 (4.39)	23.89 (4.86)	23.64 (4.46)	23.95 (4.9)
Educational level, n (%)				
Primary education	11 (4.1)	-	-	-
Secondary education	73 (26.8)	-	-	-
Tertiary education	188 (69.2)	-	-	-
Employment status†, n (%)				
Not working	27 (9.9)	12 (7.5)	11 (8.1)	9 (7.6)
Student	77 (28.3)	48 (29.6)	31 (22.8)	25 (21.2)
Employee	139 (51.1)	74 (45.7)	75 (55.1)	73 (61.9)
Self-employed	37 (13.6)	21 (13.0)	17 (12.5)	16 (13.6)
Temporary leave	4 (1.5)	3 (1.9)	6 (4.4)	5 (4.2)
Unemployed	27 (9.9)	25 (15.4)	15 (11.0)	10 (8.5)
Retired	6 (2.2)	4 (2.5)	3 (2.2)	3 (2.5)
Average gross annual income, n (%)				
No income	61 (22.4)	34 (21)	22 (16.2)	16 (13.6)
< 1MW	43 (15.8)	27 (16.7)	27 (19.9)	19 (16.1)
1MW – 2MW	65 (23.9)	35 (21.6)	30 (22.1)	31 (26.3)
2MW – 3MW	44 (16.2)	35 (21.6)	24 (17.6)	22 (18.6)
3MW – 4MW	34 (12.5)	17 (10.5)	24 (17.6)	18 (15.3)
4MW – 5MW	17 (6.3)	11 (6.8)	6 (4.4)	9 (7.6)
> 5MW	8 (2.9)	3 (1.9)	3 (2.2)	3 (2.5)
Marital status, n (%)				
Single	67 (24.6)	33 (20.4)	27 (19.9)	22 (18.6)
In a relationship / Married	186 (68.4)	119 (73.5)	98 (72)	87 (73.7)
Divorced / Widowed	19 (7)	10 (6.1)	11 (8)	9 (7.6)
Living with (household members), n (%)				
Alone	18 (6.6)	7 (4.3)	8 (5.9)	8 (6.8)
With partner	111 (40.8)	66 (40.7)	63 (46.3)	52 (44.1)
With family member(s)	101 (37.1)	72 (44.4)	53 (39)	48 (40.7)
With flatmate(s)	40 (14.7)	16 (9.8)	11 (8.1)	10 (8.5)
Other	2 (0.7)	1 (0.6)	1 (0.7)	-
COVID-19 related variables				
Contracted COVID-19, n (%)				
Yes		1 (0.6)	9 (6.6)	17 (14.4)
No		118 (72.8)	102 (75)	87 (73.7)
Not sure		43 (26.5)	25 (18.4)	14 (11.9)
Loved one infected with COVID-19, n (%)				
Yes		63 (38.9)	95 (69.9)	89 (75.4)
No		78 (48.1)	34 (25)	25 (21.2)
Not sure		21 (13)	7 (5.1)	4 (3.4)
Loved one deceased due to COVID-19, n (%)				
Yes		18 (11.1)	29 (21.3)	32 (27.1)
No		144 (88.9)	107 (78.7)	86 (72.9)

MW = Minimum wage in Spain in 2019; SD = Standard deviation; T = Time.
†Selecting more than one answer was possible.

Instagram use

Table 2 summarizes the frequency of Instagram use and whether participants followed Instagram appearance-focused accounts in each time point. No statistically significant changes were found in the frequency of Instagram use among the different data collection waves (Friedman's test, χ^2 (3) = 6.09, p = .107). Also, there was not a statistically significant change (although there was a trend towards significance) on the number of people following appearance-focused accounts on Instagram among the different waves (Cochran's Q test, χ^2 (3) = 6.51, p = .089).

Table 2. Frequency of Instagram use and frequency of participants following Instagram appearance-focused accounts in each data collection period

	Baseline	T2	T3	T4
Frequency of Instagram use, n (%)				
No Instagram account	44 (16.2)	38 (14)	29 (10.5)	23 (8.3)
Never/almost never uses Instagram	30 (11)	32 (11.9)	42 (15.3)	30 (11)
Less than half an hour / day	46 (16.9)	51 (18.7)	43 (15.9)	47 (17.4)
Half an hour to 1 hour / day	51 (18.8)	52 (19)	57 (21.1)	77 (28.2)
1 to 2 hours / day	60 (22.1)	50 (18.4)	64 (23.6)	49 (18.1)
2 to 3 hours / day	24 (8.8)	29 (10.5)	25 (9.3)	23 (8.5)
3 to 4 hours / day	12 (4.4)	11 (4.1)	12 (4.3)	13 (4.6)
More than 4 hours / day	5 (1.8)	9 (3.4)	0 (0)	10 (3.8)
Following appearance-focused accounts, n (%)				
Yes	87 (32)	91 (33.4)	99 (36.4)	101 (37.1)
No	185 (68)	181 (66.6)	173 (63.6)	171 (62.9)

T = Time

Body dissatisfaction and physical appearance comparisons

Body dissatisfaction and physical appearance comparison scores are presented in table 3 for each time point, both for the whole sample and for individuals with and without risk of having an eating disorder (according to their EAT-26 score). The mean baseline scores of body dissatisfaction and physical appearance comparisons for those at risk of having an eating disorder were significantly higher (with high effect sizes) than the scores of those without eating disorder risk (body dissatisfaction: t = -9.84, p < .001; Hedges' g [95% CI] = 1.63 [1.29-1.97]); physical appearance comparisons: t = -10.25, p < .001; Hedges' g [95% CI] = 1.74 [1.40-2.09]).

Table 3. Scores in body dissatisfaction and physical appearance comparison in each measurement wave (for the whole sample and divided by eating disorder risk)

	Baseline	T2	T3	T4
Body dissatisfaction, mean (SD)				
Whole sample (n = 272)	14.12 (9.74)	14.65 (9.75)	14.50 (9.62)	15.30 (9.49)
Sample with ED risk (n = 47)	25.33 (8.53)	24.86 (9.40)	23.50 (9.95)	23.83 (9.88)
Sample without ED risk (n = 225)	11.78 (8.24)	12.53 (8.37)	12.62 (8.40)	13.53 (8.36)
Physical appearance comparison, mean (SD)				
Whole sample (n = 272)	1.60 (1.18)	1.82 (1.20)	1.73 (1.17)	1.79 (1.19)
Sample with ED risk (n = 47)	3.03 (1.05)	3.16 (0.91)	2.92 (1.03)	2.94 (1.08)
Sample without ED risk (n = 225)	1.31 (0.97)	1.54 (1.05)	1.48 (1.03)	1.55 (1.06)

ED = Eating disorder; SD = Standard deviation; T = Time.

To assess the differences in body dissatisfaction and physical appearance comparisons among the different time points, mixed regression models with repeated measures were used. In the regression model for body dissatisfaction (table 4), body dissatisfaction significantly increased from T1 to T4 (B = 1.76; $p < .001$). The interaction between time and eating disorder risk was statistically significant at T3 ($p = .028$) and T4 ($p = .017$). BMI was significantly associated with changes in body dissatisfaction ($p < .001$): body dissatisfaction score increased .79 for each BMI unit. The educational level was not found to significantly predict body dissatisfaction.

In the subgroups analysis, it was found that the sample that was not at risk of having an eating disorder significantly increased their body dissatisfaction at T4 (B = 1.75; $p < .001$) (with respect to T1), and with a trend towards significance at T2 ($p = .089$) and T3 ($p = .075$). However, no significant changes in body dissatisfaction among time points were found in the sample at risk of having an eating disorder. In both subgroups, BMI was found to be a statistically significant predictor of body dissatisfaction.

Regarding physical appearance comparisons (table 4), they significantly increased from T1 to T2 (B = .23; $p < .001$), T3 (B = .17; $p = .009$) and T4 (B = .24; $p = .001$). The interaction between time and eating disorder risk showed a trend towards significance at T3 ($p = .093$) and T4 ($p = .053$). The effect of eating

disorder risk was significant, with a score in appearance comparisons 1.72 times higher in women with eating disorder risk versus those without eating disorder risk ($p < .001$).

In the subgroup of women without eating disorder risk, physical appearance comparisons significantly increased at T2 ($B = .23$; $p < .001$), T3 ($B = .17$; $p = .009$) and T4 ($B = .24$; $p < .001$) with respect to T1. In contrast, no significant differences were found in appearance comparisons among time points in the group of women with risk of having an eating disorder.

Table 4. Regression model for body dissatisfaction and physical appearance comparison tendency.

	Body dissatisfaction						Physical appearance comparison tendency					
	Whole sample		Sample with ED risk		Sample without ED risk		Whole sample		Sample with ED risk		Sample without ED risk	
	B (Std. Err.)	*p*	B (Std. Err.)	*p*	B (Std. Err.)	*p*	B (Std. Err.)	*p*	B (Std. Err.)	*p*	B (Std. Err.)	*p*
T2 (ref: T1)	.74 (.44)	.089	-.48 (0.99)	.633	.74 (.44)	.089	.23 (.06)	**<.001**	.14 (.13)	.313	.23 (.06)	**<.001**
T3 (ref: T1)	.84 (.47)	.075	-1.83 (1.13)	.107	.84 (.47)	.075	.17 (.07)	**.009**	-.11 (.15)	.483	.17 (.17)	**.009**
T4 (ref: T1)	1.75 (.48)	**<.001**	-1.50 (1.29)	.247	1.75 (.48)	**<.001**	.24 (.07)	**.001**	-.09 (.15)	.576	.24 (.24)	**<.001**
EAT (Risk of ED) (ref: No Risk of ED)	13.00 (1.32)	**<.001**					1.72 (.18)	**<.001**				
Time x EAT (ref: T1-No risk of ED)												
T2-Risk of ED	-1.22 (1.06)	.251					-.09 (.15)	.534				
T3-Risk of ED	-2.67 (1.21)	**.028**					-.28 (.17)	.093				
T4-Risf of ED	-3.24 (1.35)	**.017**					-.33 (.127)	.053				
BMI	.79 (.10)	**<.001**	.68 (.23)	**.004**	.83 (.12)	**<.001**	.01 (.01)	.506	-.003 (.03)	.927	.01 (.02)	.399
Educational level: Tertiary education (ref: Primary or secondary education)	-.81 (1.08)	.457	-2.40 (2.60)	.355	-.32 (1.17)	.783	.02 (.14)	.866	-.001 (.29)	.997	.04 (.15)	.814
Constant	-6.01 (2.61)	.021	10.24 (5.75)	.075	-7.40 (2.95)	.012	1.08 (.35)	.002	3.09 (.68)	<.001	.97 (.40)	.015
	F (9, 7266.1) = 14.74; *p* <.001; ICC = .752		F (5, 3702.3) = 2.11; *p* =.062; ICC = .797		F (5, 6053.2) =11.67; *p* <. 001; ICC = .738		F (9, 8846.4) = 11.08; *p* <.001; ICC = .705		F (5, 5503.6) = .78; *p* = .567; ICC = .706		F (5, 5244.8) = 3.85; *p* = .002; ICC = .704	

ED = Eating disorder; EAT = Eating attitudes test-26; BMI = Body mass index; T = Time; ICC = Intraclass correlation coefficient. The dependent variables of the model were Body dissatisfaction and Physical appearance comparison tendency.

Relationship between the changes in Instagram use throughout the pandemic and body dissatisfaction and physical appearance comparisons

As shown in table 5, no significant differences were found in body dissatisfaction and physical appearance comparisons at T4 depending on whether participants' Instagram frequency of use had increased, remained the same or decreased from T1 to T4. The same pattern was observed when the differences between T1-T2 and T1-T3 were assessed.

Similarly, no significant differences were found in body dissatisfaction and physical appearance comparisons at T4 depending on whether participants had started following appearance-focused accounts on Instagram during the pandemic, had stopped following appearance-focused accounts, or had continued following or not following appearance-centered Instagram accounts throughout the different data collection periods. The same was observed when the differences between T1-T2 and T1-T3 were assessed (table 5).

Table 5. Differences in body dissatisfaction and physical appearance comparisons according to participants' changes in Instagram use.

	T1-T2			T1-T3			T1-T4		
	%	Body dissatisfaction (T2)	Physical appearance comparisons (T2)	%	Body dissatisfaction (T3)	Physical appearance comparisons (T3)	%	Body dissatisfaction (T4)	Physical appearance comparisons (T4)
Changes in the frequency of Instagram use									
Increase in use	25.3			27.7			39		
Decrease in use	19.8	*F* (2, 219) = .92 *p* = .401	*F* (2, 221) = .56 *p* =.573	23.4	*F* (2, 220.7) = 1.01 *p* = .365	*F* (2, 234.2) = 1.68 *p* = .189	25.4	*F* (2, 207.3) = .47 *p* = .624	*F* (2, 225.8) = .57 *p* = .567
No changes in use	54.9			48.9			35.6		
Changes in following appearance-focused accounts on Instagram									
Started following appearance-focused accounts	11.1			15.4			14.4		
Stopped following appearance-focused accounts	8.6	*F* (2, 238.4) = .61 *p* = .542	*F* (2, 232.8) = .59 *p* = .556	7.4	*F* (2, 212.9) = 0.19 *p* = .824	*F* (2, 218) = 0.24 *p* = .784	6.8	*F* (2, 200) = 1.14 *p* = .321	*F* (2, 210.5) = 0.60 *p* = .552
Continued following or not following appearance-focused accounts	80.2			77.2			78.8		

DISCUSSION

The general aim of this study was to explore the changes in body dissatisfaction, physical appearance comparisons and Instagram use throughout the pandemic in a community sample of Spanish women, and to determine whether there was an association between the changes in Instagram use throughout the pandemic and body dissatisfaction and physical appearance comparisons.

Regarding the characteristics of this study's sample, we found that women's BMI increased throughout the pandemic, although the effect size of this significant increase was very small and should therefore be interpreted with caution. The literature is inconsistent in this regard: while some studies have reported an increase in BMI throughout the pandemic, others have found no changes or a decrease in women's BMI (Bakaloudi et al., 2021). BMI and weight trajectories during COVID-19 are probably dependent on many factors that should be considered, such as age, socioeconomic status, pandemic living and working conditions, diet, physical activity or alcohol intake (Khan et al., 2021). Moreover, according to our regression model, a higher BMI was found to be associated with increased body dissatisfaction. The association between a higher BMI and body dissatisfaction has been consistently reported in other studies (e.g., Quittkat et al., 2019).

Moreover, with regards to the COVID-19-related variables, the percentage of women that had suffered COVID-19 or that had a close person who had contracted the virus or deceased due to COVID-19 significantly increased in each data collection wave. This reflects how COVID-19 was more present to everybody's lives as the pandemic progressed.

Our findings suggest that there were not significant changes in the frequency of Instagram use throughout the pandemic. Similarly, there were not significant changes in the proportion of women following appearance-focused accounts on Instagram among the different data collection time periods. These results do not align with the scarce published literature (Fernandes et al., 2020; Vall-Roqué, Andrés, & Saldaña, 2021b), and this might be partly due to the longitudinal design used in this research, which included pre-pandemic data, versus the cross-sectional designs relying on

retrospective reports used in the other studies. However, it should be considered that, although our results did not yield statistical significance, the percentage of women that did not have an Instagram account decreased from 16% to 8% from baseline (before the pandemic outbreak) to the last data collection period (almost a year and a half after the start of the pandemic), and the percentage of women who used Instagram more than 4 hours per day raised from 1.8% to 3.8%. Similarly, in each data collection period, the percentage of women that followed appearance-focused accounts on Instagram increased. Therefore, it is possible that the pandemic is associated with changes in Instagram use, but these changes might be more complex (and less evident) than they seem in cross-sectional studies.

The pandemic seems to have had an effect on body dissatisfaction and physical appearance comparisons. Regarding body dissatisfaction, although its increase was not linear throughout the pandemic, there was a significant raise in body dissatisfaction from baseline to our last data collection period. This aligns with most of the published literature, which states the negative impacts of the COVID-19 pandemic on appearance, shape, and weight concerns (Schneider et al., 2022). Similarly, there was a significant increase in physical appearance comparisons from baseline to the different data collection periods. To our knowledge, this is the first study to longitudinally assess the changes on appearance comparisons throughout the pandemic. Considering that the tendency to engage in appearance comparisons has been reported to be related to body dissatisfaction and eating disturbances (Thompson, Heinberg, et al., 1999), this increase in appearance comparisons throughout the pandemic, together with the increase in body dissatisfaction, should be paid special attention as it might lead to subsequent eating disturbances or eating disorders. Moreover, considering the social distancing measures that have been in place, it is possible that current appearance comparisons occur to a greater extent in an online context (i.e., SNS, where the thin and beauty ideal is often displayed, and users easily portray a rosy image of their lives) rather than offline. Future research could shed light on this.

The findings of this study indicate that the increase in body dissatisfaction and appearance comparisons throughout the pandemic was

only significant in those individuals that were not at risk of having an eating disorder at baseline, while those with eating disorder risk did not show significant changes in their body satisfaction or appearance comparisons. Although these results need to be considered carefully as the sample with eating disorder risk was small, they suggest that women's general population's body image has worsened throughout the pandemic, but this is not the case for those with previous psychopathology, therefore we could hypothesize that those with eating disturbances were already experiencing body dissatisfaction and high appearance comparisons before the pandemic, and their symptoms did not worsen (nor improve) throughout the pandemic. Even though the vast majority of the literature suggests a negative impact of the pandemic on people with eating disorders, as indicated by Schneider et al. (2022) in their systematic review, some studies have reported positive aspects of COVID-19, including reduction in eating disorder symptomatology and greater motivation to recover from an eating disorder. Hence, the effects of the pandemic on people living with an eating disorder might be complex and need further research. Regarding women without previous eating disorder risk, further work is needed to understand mechanisms underpinning the changes in body dissatisfaction and appearance comparisons in the general population. According to Robertson et al. (2021) and Schneider et al. (2022), potential explanations or factors associated with changes in body image disturbances could include higher levels of stress, worry and anxiety (for example, resulting from increased caregiving responsibilities), increased levels of rumination, loneliness and depression, fear of COVID-19, exposure to increased weight stigma via public health and social media messaging regarding obesity and COVID-19, increased saliency of food and eating as a result of shopping restrictions and changes to daily routines, household arguments or family conflicts, and changes in living situation and access to usual support networks. Another potential explanation could be related to the fact that, as the population was suddenly mandated to remain at home for longer periods of time, individuals replaced their "unfiltered" in-person comparisons with online comparisons with influencers that promoted the beauty ideal. These changes in body dissatisfaction and appearance comparisons in community women highlight the importance of

implementing body image and eating disorders prevention programs and initiatives (e.g., media literacy programs).

However, an increase or decrease in Instagram use throughout the pandemic, or the fact of starting to follow or unfollow appearance-focused accounts on Instagram, was not associated with higher or lower levels of body dissatisfaction or appearance comparisons. This suggests that the changes in Instagram use during the pandemic might not be necessarily associated with body image problems. Staniewski & Awruk (2022) recently reported in their study a positive impact of Instagram on mental well-being during the pandemic, while other authors have stated that social media exposure during the pandemic may predict disordered eating symptoms (Bellapigna et al., 2021). These contradictory findings might be due to several reasons, including the different measures used in each study and the potential impact of confounding variables. Also, some authors have suggested that the specific social media activities (e.g., greater investment in 'selfie' activities), rather than the total time spent using it, predicts body dissatisfaction (Cohen, Newton-John, & Slater, 2018). In this line, as mentioned before, appearance comparisons on SNS (instead of changes in the frequency of use or in the types of accounts followed) might better explain increased appearance comparisons and body dissatisfaction. Hence, future research could focus on the effect of specific online activities performed during the pandemic and their impact on body image-related variables.

LIMITATIONS AND FUTURE DIRECTIONS

To our knowledge, this is the first study that longitudinally assesses the changes in body dissatisfaction, physical appearance comparisons and Instagram use throughout the COVID-19 pandemic using pre-pandemic data. Its limitations lead to several future directions. First, the sample size of this study was small, and there was a high attrition rate. Second, this study included a community sample and, although there were some women at risk of having an eating disorder, future research should examine samples with eating disorders. Third, although women are more susceptible to appearance comparisons and body dissatisfaction (Myers & Crowther, 2009), future studies

should also study men and individuals who do not identify within the gender binary system. Fourth, other SNS should be assessed, such as TikTok, which is growing rapidly and has been associated with eating disorders-related content during the pandemic (Lladó et al., 2021). Fifth, we employed a survey measurement to assess participants' perceived Instagram use, which might be less accurate than in-situ measurements (Naab, Karnowski, & Schlütz, 2018). Future studies could use more objective digital trace data sources to measure SNS use. Sixth, the measure that we used to assess physical appearance comparisons poses two potential limitations: (1) although it examines comparisons in several social contexts, it does not specifically assess comparisons on social media; future research could include specific items about comparisons on social media, and (2) some items of this questionnaire refer to social situations that were prohibited during the strict phase of lockdown (e.g., eating in a restaurant or going shopping). Although the scale asks respondents to answer items thinking in what they usually do (and not in the specific moment of answering the questionnaire), this should be taken into consideration. Finally, as participants' recruitment was conducted especially online, the sample of this study is not representative of the Spanish population.

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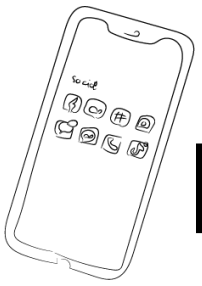

DISCUSSION

4. Discussion

In the following chapter the results of this thesis are discussed grouped in short sections that address the main ideas we want to highlight: 1) the general impact of the pandemic; 2) SNSs use and body image disturbance during the pandemic; 3) the role of appearance comparisons; 4) the need to consider the pandemic impact on the general population and not only on those with previous psychopathology; 5) gender-related differences in our results; 6) age-related differences in our results. Finally, a section on strengths, limitations and future research is provided.

4.1. The pandemic, a nightmare for many

Thousands of articles have been published during the last few years tackling the mental health problems associated with the pandemic. According to a large-scale meta-analytic review of mental health problems prevalence during the COVID-19 early pandemic (Dragioti et al., 2022), the pandemic was associated with a high prevalence of mental health problems globally, but with specific effects across different population groups. Overall, Dragioti et al. (2022) found an increase in the prevalence rates of anxiety, depression, stress, and sleep problems among general population. Our findings align with these results: high rates of depression, anxiety and stress were found in our sample (Study 2). However, a recent systematic review that synthesised results of mental health outcomes in cohorts' studies along the pandemic concluded that most symptom change estimates for general mental health, anxiety symptoms, and depression symptoms were close to zero and not statistically significant when considering the pandemic impact (Sun et al., 2023). The authors of this review suggested caution in interpreting results as high risk of bias in many studies and substantial heterogeneity were found. Also, in line with Dragioti et al. (2022), Sun et al. (2023) reported differences among subgroups. For example, women were the only group that experienced a worsening of symptoms across all outcome domains (Sun et al., 2023). This will be further discussed in the section *'Gender matters'*.

Differences across population groups were also found in our research. For example, participants who were unemployed had higher levels of depression, anxiety and stress, and had a lower self-esteem, compared to those who had a job. This is not surprising, as the relationship between unemployment and psychological distress and feelings of worthlessness has been repeatedly reported (Backhans & Hemmingsson, 2012; Farré et al., 2018; Paul & Moser, 2009). This finding is important considering that unemployment in Spain surged during the first year of the pandemic (Malo, 2021). Also, psychological distress and eating disturbances were found to be present to a greater extent in those who had suffered the loss of a close person due to COVID-19 and in those who considered that did not have a place at home where they could relax during lockdown. These results are congruent with the literature (Grace, 2021; Huang & Kwan, 2022; Joaquim et al., 2021), and have important implications. First, special attention should be paid to the mourning process -which has been sharply circumscribed- of those who lost a loved one due to COVID-19, considering that, according to our research, the vast majority of individuals who experienced the loss of a close person did not have the chance to say goodbye, and "*people who would normally have access to high levels of social support have grieved in relative isolation, robbed of this coping resource by the same social distancing protocols designed to protect them*" (Grace, 2021). Second, living and housing conditions might play an important role in the psychological distress associated with the pandemic (Huang & Kwan, 2022), and could be linked with a higher lockdown burden for lower income families (Mental Health Foundation, 2020).

In Study 2, which was conducted a few months after the pandemic outbreak, we asked participants (young women in particular) whether they considered that specific life areas had improved, worsened or remained the same since the lockdown began (in comparison to before the pandemic). Most participants reported a deterioration in sleep, which is congruent with the literature (Alimoradi et al., 2021), and a worsening in feelings of anxiety, sadness and loneliness, which also aligns with other published articles (Buecker & Horstmann, 2021; Dragioti et al., 2022; Philpot et al., 2021; Takács et al., 2023). Concerns about one's future, together with health concerns, also worsened for most individuals of our sample. In contrast, more than half of the

sample reported an improvement in their self-caring time. This goes in line with Termorshuizen et al.'s (2020) findings, who described positive outcomes of the pandemic in people with eating disorders, which included making time for self-care. Some articles have highlighted the importance of self-care practices during the COVID-19 pandemic (e.g., Mollica et al., 2021; O'Brien et al., 2021), and it has been suggested that adopting self-care activities could improve people's well-being during the COVID-19 lockdown (Luis et al., 2021). Hence, it could be hypothesized that those who engaged in self-care activities to a greater extent also had better mental health outcomes. Nearly half of the sample reported changes in family, friends and couple relationships: while some individuals perceived that these changed to worse, others reported an improvement with the pandemic. As Philpot et al. (2021) discuss, some individuals experienced an increased sense of emotional support during a period of social distancing, as people leverage social support to cope during a time of high stress. Moreover, the COVID-19 pandemic might have offered opportunities for individuals to (re)connect and (re)strengthen close relationships within their household via quality time together (Long et al., 2022). At the same time, however, stay-at-home orders and social distancing measures negatively impacted social relationships in many cases (Long et al., 2022; Philpot et al., 2021). Changes in physical activity were also polarized, with around 40% of individuals reporting an improvement in this area during lockdown, and another 40% reported a deterioration. Different studies have concluded that lockdown was associated with substantial reductions in physical activity, and a decreased level of physical activity during lockdown has been associated with higher depression, anxiety and stress scores, among others (Ding et al., 2021; Marashi et al., 2021; Violant-Holz et al., 2020). Hence, our results partly contradict most of the published literature. According to the health belief model (Rosenstock, 1974), lack of time is a common perceived barrier to being physically active. It could be argued that for some people, having more time during lockdown led to increased physical exercise. Future research could examine this in more detail. Finally, almost half of the sample indicated that their eating habits and appearance concerns had worsened since lockdown began. This is congruent with most of the literature, even though some studies have reported positive outcomes of the COVID-19

pandemic in body image-related areas (Schneider et al., 2023), as it will be further explained in the next section.

Overall, these findings suggest that the pandemic-associated lockdown had a negative impact on many life domains. However, the fact that 'the world stopped' for a few months made it possible for some people to engage in self-care activities, which might include doing more physical activity. In fact, the psychological impact of COVID-19 lockdowns is highly heterogeneous and might have had positive consequences for some individuals (Prati & Mancini, 2021).

Moreover, according to results in Study 2, a higher perceived psychological impact of the lockdown-related variables (in terms of perceived changes in appearance concerns, self-care time, health concerns and feeling of autonomy) and a lower self-esteem were directly related to higher levels of disordered eating, anxiety, depression, and stress symptoms. This suggests that individuals who perceived that specific life domains deteriorated with lockdown then showed increased psychopathology symptoms, in terms of disordered eating and emotional distress. A potential implication of this finding is that individuals who describe several negative changes associated with their lockdown experience might exhibit negative mental health outcomes to a greater extent.

To sum up, it should be considered that we used a cross-sectional design, and we did not use pre-pandemic data, to examine the aspects mentioned in this section. Hence, we cannot talk about an 'impact' of the pandemic as causality cannot be assumed. This limitation is present in most research that has aimed to measure mental health during the pandemic (Banks et al., 2021), and will be further discussed in the research limitations section of this thesis.

4.2. Pandemic, social networks and body image

Studies 3 and 4 aimed to explore SNSs use and body image disturbance during the COVID-19 pandemic. While Study 3 had a cross-sectional and retrospective design and included data collected in May 2020 (initial period of

the pandemic), Study 4 involved a longitudinal data collection that lasted for 19 months, and included pre-pandemic data that we used as baseline data.

The results of Study 3 suggested that there was an increase in the frequency of use of SNSs (Instagram, TikTok, Twitter, Facebook and Youtube) and in the number of women following appearance-focused accounts on Instagram during lockdown. In contrast, in Study 4 we did not find significant changes in the frequency of Instagram use throughout the pandemic, nor significant changes (although there was a trend toward significance) in the proportion of women following appearance-focused accounts on Instagram among the different data collection time periods. This discrepancy might be due to the longitudinal design used in Study 4, which included pre-pandemic data, versus the cross-sectional design relying on retrospective reports used in Study 3 (i.e., participants were asked to self-report their use of SNSs both at the time of completing the survey and before lockdown). As Little et al. (2020) point out, the retrospective pretest design provides an economical and efficient means to collect quality evaluation data when it may not be feasible to collect data at multiple occasions. However, one of its main limitations is that it is prone to recall or memory biases (Pratt et al., 2000). Hence, it is possible that, when participants had to report their SNSs use before lockdown in Study 3, they underestimated their frequency of use of SNSs and the number of appearance-focused accounts followed on Instagram.

However, it is also possible that there was indeed an increase in the frequency of use and in the appearance-focused use of SNSs during lockdown. Although results of Study 4 did not yield statistical significance, the percentage of women that did not have an Instagram account decreased from 16% to 8% from baseline to the last data collection period, and in each data collection wave the percentage of women that followed appearance-focused accounts on Instagram increased. As mentioned in the Introduction chapter of this thesis, different authors have concluded that the pandemic or the lockdown period has been associated with an increase in the use of SNSs, with TikTok being the one with the greatest increase, particularly among adolescents and young adults (Arend et al., 2021; Cellini et al., 2020; Fumagalli et al., 2021; Marciano et al., 2022; Pérez-Escoda et al., 2020; Rosen et al., 2022; Statista, 2023). It could be the case that Study 4 did not find statistically significant

differences throughout the pandemic due to the wide age range included in the study, with a mean age higher than in other studies, or due to its small sample size, compared to Study 3 and other studies.

Nonetheless, it should be noted that very few studies have used longitudinal designs and pre-pandemic data to examine changes in individuals' SNSs frequency of use. Also, to our knowledge, no other studies have assessed changes or trajectories in appearance-focused use of SNSs throughout the pandemic. Moreover, several articles examining SNSs use during the pandemic reported "social media use", "screen time" or "SNSs use" as a whole, without distinguishing among specific SNSs (e.g., Arend et al., 2021; Cellini et al., 2020; Fumagalli et al., 2021; Marciano et al., 2022; Rosen et al., 2022), which complicates the comparison of findings, as some studies might include very different types of social media (e.g., instant messaging platforms). All these aspects pose a substantial challenge when aiming to determine the specific effects of the pandemic on SNSs use. Further research is needed to provide a better understanding on the topic, as the pandemic is probably associated with changes in SNSs use, but these changes might be more complex (and less evident) than they seem in most cross-sectional studies.

Regarding the changes in body dissatisfaction and appearance comparisons throughout the pandemic, according to our results of Study 4, there was a significant increase in both domains: in the case of body dissatisfaction, this increase was significant from pre-pandemic period to follow-up at one year and a half after the pandemic started, and for appearance comparisons, a significant increase was found from baseline to all the different data collection points. This aligns with most of the published literature, which states the negative impact of the COVID-19 pandemic on appearance, shape, and weight concerns (Schneider et al., 2023). However, to our knowledge, this is the first study that longitudinally examines the changes in appearance comparisons associated with the pandemic. As it will be discussed in the next section, the fact that appearance comparisons significantly increased throughout the pandemic might have important implications, as it could highlight the key role of appearance comparisons. Also, these findings suggest that the

increase in body dissatisfaction and appearance comparisons were not circumscribed to the lockdown period. In fact, body dissatisfaction significantly increased one year and a half after the pandemic outbreak, compared to the pre-pandemic status, but not in the other measuring points. This could be interpreted in several manners. For example, it could suggest some delayed or long-term effects of the pandemic on body dissatisfaction. Along these lines, different authors have expressed concerns about the long-term impact of COVID-19 on mental health (Kawakami et al., 2022; Nuryana et al., 2022). It could be hypothesized that the increase in distress and appearance comparisons that took place soon after the pandemic outbreak led to increased body dissatisfaction some months later, considering that appearance comparisons are one of the most well-evidenced mechanisms for body dissatisfaction (Fardouly et al., 2017; Fardouly & Vartanian, 2016; Myers & Crowther, 2009; Tylka et al., 2023; Want, 2009). Another interpretation could be that the significant increase in body dissatisfaction one year and a half after the pandemic outbreak was due to reasons unrelated to the pandemic. For example, Griffiths et al. (2021) introduced the term "seasonal body image" to refer to within-person variation in body image that occurs across the Gregorian seasons of spring, summer, autumn and winter, and reported peaks of body dissatisfaction in summer. In our study, the last data collection period was performed from June 7 to July 5, 2021, therefore it included both spring and summer seasons. Hence, it could be hypothesized that the increase in body dissatisfaction found in our study was partly influenced by seasonal factors. Also, considering the gradual normalisation of activities that took place after the initial year of the pandemic, face-to-face interactions progressively replaced the digital ones, and people's bodies and faces cannot be altered or "filtered" as much in-person as in the online world. Hence, the increase of in-person interactions could have led to a surge in body dissatisfaction.

This thesis also explored the association between SNSs use and body image-related variables during the pandemic. According to our results of Study 3, the frequency of use of Instagram was positively associated with body dissatisfaction, drive for thinness and low self-esteem among women aged 14-

24. In women that were between 25 and 35 years old, the frequency of use of Instagram was only associated with drive for thinness. Also, following appearance-focused accounts on Instagram was found to be associated with drive for thinness in both age groups, and also with body dissatisfaction for those aged 14-24. The differences across age groups are congruent with the literature, as it will be further discussed within the section *'Age matters'*. Overall, our results align with the literature, which states that a high frequency of use of SNSs and engaging in appearance-based activities on SNSs activities (e.g., viewing appearance-ideal images and digitally edited images) are factors linked to body image disturbance (de Valle et al., 2021; Faelens et al., 2021; Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Ryding & Kuss, 2020; Silva et al., 2020; Vandenbosch et al., 2022). Moreover, we provide evidence that this relationship was still in place during the lockdown period of the pandemic. With regards to self-esteem, our results support the studies that suggest that a higher frequency of SNSs use in adolescents is associated with lower levels of self-esteem (e.g., Vogel et al., 2014). However, it should be noted that the effect sizes of our study were small, therefore these results should be interpreted with caution.

Also in accordance with the (pre-pandemic) literature, in Study 3 we found that following appearance-focused accounts on Instagram and a higher frequency of use of Instagram predicted higher levels of drive for thinness (Holland & Tiggemann, 2016; Sherlock & Wagstaff, 2019). Hence, this well-established relationship seemed to be maintained during the initial months of the pandemic. Should it be the case that (appearance-focused) SNSs use increased during the pandemic (despite the contradictory findings between studies 3 and 4 mentioned above), these results might suggest that the detrimental effects of SNSs on body image could have been exacerbated during the pandemic, and we could hypothesize that those who started following appearance-focused accounts or increased their frequency of Instagram use throughout the pandemic would show an increase in body image disturbance and appearance comparisons. However, contrary to this hypothesis, in Study 4 we concluded that an increase or decrease in Instagram use throughout the pandemic, or the fact of starting to follow or unfollow appearance-focused accounts on Instagram, was not associated with higher

or lower levels of body dissatisfaction or appearance comparisons. This suggests that the changes in Instagram use during the pandemic might not be necessarily associated with increased or decreased body image disturbance, which aligns with Marciano et al.'s (2022) key message: not all uses of digital media had negative consequences on mental health during the pandemic. As mentioned in the Introduction chapter, while some authors have reported a positive impact of SNSs use on mental health during the pandemic (e.g., Midgley et al., 2022; Staniewski & Awruk, 2022), others have concluded that SNSs' increased use was associated with negative mental health outcomes, including disordered eating symptoms (Bellapigna et al., 2023; Iqbal et al., 2022; Lee et al., 2022). Different interpretations could be made of our potentially contradictory findings. For example, some authors have suggested that specific social media activities (e.g., greater investment in "selfie" activities), rather than the total time spent using SNSs, predicts body image disturbance (Cohen et al., 2018). Hence, it could be the case that an increase during the pandemic in specific types of activities on SNSs (rather than an increase in frequency of use or the fact of starting to follow appearance-focused accounts) would be associated with an increase in body dissatisfaction and appearance comparisons. Another potential explanation could be related to the small sample size of Study 4, in comparison with Study 3, and to the wide age range included in Study 4, which might have blurred the results.

4.3. Appearance comparisons, a key player

As explained in the Introduction chapter, it is of paramount importance to consider the role of appearance comparisons in the context of SNSs and body image research. Appearance comparisons have been conceptualized as a cognitive process that mediates or moderates the relationship between SNSs use and body image disturbance (Fardouly, Willburger, et al., 2018; Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Perloff, 2014; Ryding & Kuss, 2020; Silva et al., 2020; Tylka et al., 2023). The body image of women who have a greater tendency to compare their bodies to others seems to be more

negatively impacted by appearance-focused SNSs use compared to those who exhibit lower levels of appearance comparisons (Tylka et al., 2023).

Considering the lack of evidence of the adequacy of scales measuring physical appearance comparison in wide age ranges in Spanish population, one of the objectives of this thesis was to validate the PACS-R in a mixed-gender Spanish community sample. Study 1 supported the reliability and validity of the Spanish version of the PACS-R in women and men, suggesting that our validated version of the questionnaire can be a useful tool for clinicians and researchers to assess physical appearance comparison tendency. Also, Study 1 found that appearance comparison is associated with internalization of appearance ideals, appearance-related sociocultural pressures, social comparison tendency, decreased self-assessed physical attractiveness, low self-esteem, drive for thinness, body dissatisfaction and disordered eating. Furthermore, we concluded that appearance comparison significantly predicts body dissatisfaction and disordered eating. These findings go in accordance with the literature (e.g., Fardouly & Vartanian, 2016; Myers & Crowther, 2009; Thompson et al., 1991; Tylka et al., 2023; Want, 2009).

Considering that appearance comparisons can predict body dissatisfaction and disordered eating, one of the aims of Study 4 was to assess the potential changes in appearance comparisons throughout the pandemic, as it could be hypothesized that an increase in appearance comparisons during the pandemic could lead to subsequent body image disturbance and disordered eating symptoms. In fact, as mentioned in the previous section, we found a significant increase in appearance comparisons from baseline to all the different data collection points. This could have important implications. First, in line with the social comparison theory (Festinger, 1954) and the tripartite influence model (Thompson et al., 1999), this increase could precede or predict subsequent body dissatisfaction, eating disturbances and eating disorders. Hence, special attention should be paid to appearance comparisons (e.g., in clinical settings or in prevention programs), as individuals who express that they tend to compare their bodies or appearances to others' bodies or appearances more often since the pandemic outbreak could then develop eating disturbances to a greater extent. Second, it might seem surprising that appearance comparisons increased during a period where various social

distancing measures were in place. A potential explanation is that appearance comparisons probably occurred to a greater extent in an online context rather than offline. SNSs (especially image or video-based SNSs, such as Instagram or TikTok) often portray unrealistic images or videos of beauty (Perloff, 2014), and provide many opportunities for frequent and effortless appearance comparisons. It could be the case that individuals replaced their "unfiltered" in-person comparisons with online comparisons with influencers that promoted the beauty ideal. Taking into account that appearance comparisons through social media (especially upward comparisons) are associated with less appearance satisfaction than comparisons made in person (Fardouly et al., 2017), it is key to acknowledge the potential detrimental effects that this kind of comparisons during the pandemic might have had on body image.

Finally, social comparisons in the SNSs environment have been suggested to result in adverse effects on individuals' self-esteem (Krause et al., 2021). This could have important implications in the pandemic context: an increase in appearance comparisons during the pandemic could have had a negative impact on users' self-esteem. Future research should aim at examining the relationship between SNSs use and self-esteem within the pandemic context.

4.4. It's not just about those who were already 'unwell' before the pandemic

A relevant finding of Study 4 was that the increase in body dissatisfaction and appearance comparisons throughout the pandemic was only significant in women that were not at risk of having an eating disorder before the pandemic, while those with previous eating disorder risk did not show significant changes in their body dissatisfaction or appearance comparisons throughout the pandemic. These results should be considered carefully because the sample with eating disorder risk was small. However, they could imply that women's general population might have been affected to a greater extent to the detrimental effects of the pandemic to body image compared to women who were already "unwell" before the pandemic.

Several articles have concluded that the pandemic has been associated with adverse mental health outcomes, including disordered eating and body image disturbance, among women in general (Schneider et al., 2023). Potential explanations or factors associated with changes in body image disturbance include suffering high levels of stress, worry and anxiety, increased levels of rumination, loneliness and depression, low self-compassion, poor coping and emotion regulation strategies, fear of COVID-19, exposure to increased weight stigma via public health and social media messaging, increased saliency of food and eating as a result of shopping restrictions and changes to daily routines, household arguments or family conflicts, and changes in living situation and access to usual support networks (Robertson et al., 2021; Schneider et al., 2023; Swami, Todd, et al., 2021). Also, as mentioned in the previous section, another potential explanation for increased body image disturbance could be related to the increase in social media appearance comparisons. However, further research is needed to understand the mechanisms underpinning the changes in body dissatisfaction and appearance comparisons in the general population.

Different authors have concluded that the pandemic was associated with a worsening in specific and general symptomatology and mental health outcomes in individuals living with eating disorders (Devoe et al., 2023; Schneider et al., 2023). For example, Branley-Bell & Tabot (2020) stated that the pandemic was having a profound, negative impact upon individuals with experience of eating disorders: decreased feelings of control, increased feelings of social isolation, increased rumination about disordered eating, and low feelings of social support were reported. Similarly, Baenas et al. (2020) concluded that a quarter of patients with eating disorders showed symptom deterioration, and this was mainly associated with low self-directedness. Giel et al. (2021), in turn, found that participants with binge eating disorder had a significant increase in binge eating episodes during lockdown compared to before the COVID-19 outbreak. Even though most studies reported worsening of eating disorder symptoms following the pandemic onset, some authors did not find significant changes, which aligns with our findings, or reported positive outcomes of the pandemic or mixed findings (Frayn et al., 2021; McCombie et al., 2020; Pegram et al., 2023; Schlegl, Maier, et al., 2020;

Schneider et al., 2023; Termorshuizen et al., 2020; Zeiler et al., 2021). For example, Machado et al. (2020) found no significant changes in eating disorder symptoms and BMI after lockdown compared to before in patients with eating disorders. Castellini et al. (2020), in turn, found that eating disorder symptomatology improved in patients with anorexia nervosa and bulimia nervosa, and BMI increased in patients with anorexia nervosa, which might be attributed to the fact that the patients included in the study were actively being followed in treatment programs. These authors also concluded that individuals with eating disorders did not report a more severe increase of symptoms (anxiety, sadness, and sleep problems) as compared to healthy controls. Pegram et al. (2023) recently conducted a qualitative study exploring the impact of the COVID-19 pandemic on eating disorder recovery and concluded that, while several individuals experienced a resurge in eating disorders symptomatology during lockdown, for others lockdown provided an opportunity to reflect on and self-manage recovery. As mentioned in the Introduction chapter, it should be noted that the positive outcomes of the pandemic in people with eating disorders might be partly related to the socioeconomic status of participants, suggesting that individuals with higher social privilege have incurred fewer financial pressures, and this might have facilitated engagement with self-care, recovery activities, and social support (Schneider et al., 2023). Also, as Devoe et al. (2023) discuss, there is high variability of findings across eating disorder diagnoses in different studies, which could be due to the heterogeneity of effects of the pandemic public health measures across populations.

Different interpretations could be made of the finding that women without previous eating disorders risk showed a significant increase in body dissatisfaction and appearance comparisons while those with pre-pandemic eating disorder risk did not exhibit significant changes in their levels of body dissatisfaction or appearance comparisons throughout the pandemic. We could hypothesize that those with previous eating disturbances or eating disorders were already experiencing body dissatisfaction and high appearance comparisons before the pandemic onset, and with COVID-19 lockdown they had more time to reflect on recovery and engage in self-care activities, which might have been associated with greater motivation to

recover and more time to connect with their family (Schneider et al., 2023). This might be related to the finding previously mentioned of Study 2 regarding the improvement in self-caring time in more than half of the sample during lockdown: it is possible that some individuals living with eating disturbances could "pause" their routines and engage in self-care activities to a greater extent during the pandemic. It could also be hypothesized that, considering that people with eating disorders often report a severe social isolation, they might have been less sensitive to the lockdown effects, and therefore to its psychopathological consequences (Castellini et al., 2020). Also, for some individuals with eating disorders or disordered eating, the lockdown period might have been associated with reduced exposure to the gaze of others, and to the judgment or criticisms from friends, doctors or some family members (Castellini et al., 2020). This might explain the lack of significant increase of body dissatisfaction and appearance comparisons. However, this does not explain the fact that body dissatisfaction and appearance comparisons remained stable even one year and a half after the pandemic outbreak in our study.

In conclusion, it seems clear that the effects of the pandemic on people living with an eating disorder are complex and need further research. Moreover, our results suggest that interventions, prevention programs or research studies should not focus only on those who had pre-existing mental health problems before the pandemic but also on the general population. It is key to design and implement body image and eating disorders prevention programs and initiatives (e.g., media literacy programs) targeting community samples.

4.5. Gender matters

The effects of the pandemic have not been evenly felt across different groups. Many studies, using a variety of data sources and mental health measures, have stated that the pandemic led to a larger decline in mental health among women, who already had worse levels of mental health than men before the pandemic hit, and that pre-existing inequalities between women and men intensified during the COVID-19 pandemic (Banks et al., 2021; Flor et al., 2022; Gibson et al., 2021). With regards to body image and disordered eating, as

mentioned in the Introduction chapter, the association between pandemic-related stress and eating disorder symptoms and perceived weight gain seems to be stronger in women and individuals who identify as LGBTQ+ compared to cisgender and heterosexual men (Schneider et al., 2023). However, some studies have reported no effect of gender on body image or eating outcomes during COVID-19 (Kim et al., 2022; Puhl et al., 2020).

Considering the differences found between men and women in our Studies 1 and 2, we decided to focus the third and fourth studies of this thesis on women. In Study 1 we found that men engage in fewer appearance comparisons than women, which is consistent with previous literature (Davison & McCabe, 2005). Among other asp ects, we also found a difference in the relationship between appearance comparisons and oral control: while this relationship was significant for women, it was not for men. As discussed in Study 1, this could suggest that appearance comparisons are directly related to restrictive eating among women, whereas in men appearance comparisons might not be necessarily focused on eating control to achieve a thin ideal.

Our results of Study 2 also suggest that there were significant differences between men and women, even though we cannot infer that these were caused by the pandemic. For example, we found significant differences in the feeling of having a place at home where participants could relax during lockdown, with more men reporting that they felt they had a space where they could relax compared to women. This might be due to several factors. For instance, it might be associated with the fact that women bore a disproportionate share of household responsibilities compared to men in households with two opposite-gender individuals, and bore the brunt of additional childcare that resulted from school closures (Andrew et al., 2020). In Study 2 we also found significant differences between men and women in disordered eating (specifically, in the EAT-26 subscales Dieting and Bulimia and food preoccupation), being women those who were at higher risk for developing an eating disorder. These results align with previous literature (e.g., Elgin & Pritchard, 2006; González et al., 2018), and also with our results of Study 1, and suggest that the higher rates of eating disturbances in women compared to men have been maintained during the pandemic.

Overall, these findings suggest that men and women differ substantially when it comes to body image and appearance comparisons, both in general and in the pandemic context.

4.6. Age matters

As indicated in the Introduction chapter of this thesis, several studies have suggested that younger people were more vulnerable to or exhibited higher prevalence rates of mental health problems during the pandemic (Dragioti et al., 2022; Gibson et al., 2021; Nearchou et al., 2020; Panchal et al., 2021; Racine et al., 2021; Varma et al., 2021). Similarly, even though the effect of age on body image or disordered eating during the pandemic is not clear yet, a few articles have linked a younger age with increased eating disorder symptomatology (Schneider et al., 2023).

Taking this evidence into account, we decided that our cross-sectional pandemic studies (Studies 2 and 3) would involve a young sample, and that we would examine the differences among two age groups: *generation Z* (aged 14-24 when the studies were conducted) and *generation Y* or *Millennials* (aged 25-35 when the studies were carried out). In our longitudinal study, we included a broader age range for the sample to be more representative of the whole women population, and we did not analyse age differences.

Our results of Studies 2 and 3 indicated that the younger age group had significantly higher levels of depression, anxiety, stress and oral control, and significantly lower levels of self-esteem and body dissatisfaction, than the *Millennials* age group. Some of these findings go in line with other studies. For example, it has been reported that adolescence is a critical period for the development of identity and is often associated with a loss of self-esteem, with the lowest level of the whole life span attained during that period (Robins et al., 2002). Also, previous studies have supported a negative correlation between age and anxiety and depression symptoms (Christensen et al., 1999). Regarding the pandemic, different authors have concluded that younger individuals had higher levels of anxiety and depression compared to other age

groups during the lockdown period (Fancourt et al., 2021; Smith et al., 2020; Solomou & Constantinidou, 2020), even though it is possible that young people's mental health returned to normal more quickly after the initial period (Banks et al., 2021). In the case of young students, considering our finding of Study 2 that 62% of students felt that there had been an increase in assignments since the beginning of lockdown, it might be the case that they experienced additional stress due to the need to adapt to the online educational environment enforced by the pandemic situation. However, the finding that body dissatisfaction was higher in the older age group is only congruent with part of the literature. As mentioned in the Introduction, some authors have indicated that body dissatisfaction remains relatively stable across the life span (Quittkat et al., 2019; Tiggemann, 2004; Tiggemann & McCourt, 2013), or that body dissatisfaction is higher during adolescence (Esnaola, 2010), whereas others have claimed that youth are increasingly dissatisfied with their bodies as their BMI increases from middle school to young adulthood (Bucchianeri et al., 2013). The latter explanation would support our finding. However, further research is needed to clarify the differences in body dissatisfaction among age groups, and specifically within the pandemic context.

Regarding SNSs use, we did not find significant differences between age groups in the proportion of women following appearance-focused accounts on Instagram. However, we did find significant differences in the frequency of use of all SNSs included in Study 3: participants from generation Z were the ones who used Instagram, Youtube, TikTok and Twitter most frequently during lockdown, and participants from generation Y used Facebook more often. This aligns with the current trends in SNSs usage by age (Acebes & Montanera, 2022). With the pandemic, the frequency of use of all SNSs and the proportion of women following appearance-focused accounts on Instagram increased for both age groups, which suggests that the changes in SNSs took place in a cross-cutting manner across different generations. However, as explained before, in Study 4 we did not find significant changes in SNSs use throughout the pandemic, therefore these results should be interpreted with caution.

Finally, as mentioned before, in Study 3 we found that the frequency of use of Instagram during lockdown was positively associated with body dissatisfaction, drive for thinness and low self-esteem among women aged 14-24, whereas in women aged 25-35 the frequency of use of Instagram was only associated with drive for thinness. Also, following appearance-focused accounts on Instagram was associated with drive for thinness in both age groups, and with body dissatisfaction in those aged 14-24. These differences across age groups are congruent with the literature, as it has been suggested that the relationship between SNSs use and body image disturbance weakens as individuals increase in age (Saiphoo & Vahedi, 2019). Moreover, these findings suggest that adolescents who use Instagram very often exhibit lower levels of self-esteem compared to those who do not use Instagram as frequently. Previous studies have found an association between the use of SNSs and low self-esteem in adolescents (Andreassen et al., 2017; Fioravanti et al., 2012; Mehdizadeh, 2010). Considering that Instagram is widely used among adolescents (Acebes & Montanera, 2022), special attention should be paid to the potential detrimental effects of (appearance-focused) Instagram use within this age group.

These findings suggest a more detrimental effect of (appearance-focused) Instagram use during lockdown in generation Z compared to generation X, even though causality or direction of effect cannot be assumed. Overall, our results suggest a specially challenging psychological experience during lockdown among generation Z individuals, which highlights the importance of delivering early interventions targeting SNSs use, body image and self-esteem.

4.7. Research strengths, limitations, and future directions

This thesis contributes to the understanding of SNSs use, body image disturbance, appearance comparisons and other psychological outcomes during the COVID-19 pandemic. It combines two main research areas: (1) the field that studies the relationship between social media use and body image, and (2) the mental health aspects associated with the COVID-19 pandemic.

These two research areas are constantly evolving. The greater complexities of the link between social media use and body image are just starting to be investigated, and there is still much uncertainty on how the full mental health consequences of COVID-19 will play out. A proof of that is that thousands of articles related to some extent to the topics of our studies have been published since this thesis started.

The specific limitations of our designs, samples and procedures have already been stated in each study. In this section, we aim to discuss the main strengths and limitations of this thesis, and to indicate potential areas for future research.

One of the main strengths of this thesis is that we included pre-pandemic data, which were analysed by means of a longitudinal design (Study 4). Most research tackling the mental health aspects associated with the pandemic has a cross-sectional design and/or does not contain information from before the onset of COVID-19, which makes it difficult to estimate the impact of the pandemic (Banks et al., 2021). Despite Study 4 had a longitudinal design, the other pandemic-related studies of this thesis had a cross-sectional design, therefore causality and directionality of effects cannot be assumed. In Study 2, changes in life domains were retrospectively self-reported, therefore our results might be affected by recall bias. Similarly, in Study 3 we used a retrospective design, which has been found to be a valuable alternative to traditional pretest-posttest design, but has been linked with memory-related problems and response bias (Little et al., 2020).

Furthermore, Studies 2 and 3 were conducted during the first months after the pandemic outbreak. This enabled us to capture the situation in the early months of the COVID-19 pandemic. However, it has been suggested that mental health deteriorated prior to lockdown orders coming in, and once they were introduced, mental health stabilised and even began to improve (Banks et al., 2021). Hence, the results of Studies 2 and 3 might not be representative of the mental health status in different moments of the pandemic.

Another strength of this thesis is that we included variables that, to our knowledge, have not been measured elsewhere within the pandemic context.

In this regard, we assessed appearance comparisons and appearance-focused Instagram use throughout the pandemic.

In contrast, a limitation of this thesis is the sampling and recruitment procedure. As participants' recruitment was mainly conducted online, the samples of the different studies are not representative of the Spanish population. Moreover, we focused on women and on adolescent and young individuals in some of the studies. This provided us with valuable information about two vulnerable groups to the effects of the pandemic. However, future research should aim at examining the impact of the pandemic on men and individuals who do not identify within the gender binary system. Also, as highlighted by Schneider et al. (2023), forthcoming studies should explore the influence of the COVID-19 pandemic on participants from historically marginalized or underrepresented groups. Similarly, Harriger et al. (2023) urge research on social media and body image to extend beyond convenience sampling of young, White women and include children and older adults, boys and men, and underrepresented groups. In this regard, a limitation of our research is that we did not provide information about participants' ethnicity or sexual orientation, for example. Future studies should consider how intersectionality of multiple marginalized identities may have influenced adverse mental health outcomes during the pandemic. Moreover, we did not focus our research on individuals with eating disorders. Future research may help to provide a greater understanding of the impact of the pandemic on people living with an eating disorder, accurately determining trajectories for different subgroups (e.g., depending on individuals' BMI, age, eating disorder risk, or type of eating disorder).

Another limitation of this thesis is related to the measurement of SNSs use. This is a common limitation in studies assessing SNSs use, as objectively measuring SNSs use is still a challenge. We did not use a validated questionnaire due to the absence of a well-validated questionnaire that measures appearance-focused use of Instagram. As discussed by Faelens et al. (2021), the operationalization of intensity of Instagram use varies widely across studies, and the literature would benefit from the development of a well-validated and reliable measure of Instagram use that could be used consistently across studies. Also, we used self-report estimates for frequency

of SNSs use, which may be affected by recall bias and might be less accurate than insitu measurements (Naab et al., 2019). Future studies should use applications and software that can objectively monitor participants' SNSs use (Faelens et al., 2021), or adopt other methodologies such as ecological momentary assessment or computational methods (Jarman et al., 2022). Also, as Harriger et al. (2023) suggest, future research should move away from simplistic measures of social media and utilize mixed-methods approaches.

Moreover, it is not only about *how* we measure SNSs but *what* we measure. Future studies could explore more fine-grained measures, such as the purpose of SNSs use, the type of communication partners (Valkenburg, 2022), the specific activities performed while using SNSs or the type of content consumed (Sanzari et al., 2023). Also, it would be relevant to focus on other SNSs such as TikTok, which is growing rapidly and has been associated with eating disorders-related content during the pandemic (Jordan et al., 2021).

Apart from tackling SNSs use, this thesis assessed body dissatisfaction and appearance comparisons, among other aspects. As discussed by Schneider et al. (2023), there is high variability in measures used to assess body image and eating outcomes within the pandemic context, making comparison across studies challenging. Also, the measure that we used to assess physical appearance comparisons (PACS-R) does not specifically assess comparisons on social media. Considering the potentially key role of social media appearance comparisons, future research could aim to develop a tool that specifically assesses appearance comparisons within the context of social media. To our knowledge, some studies have created a single item or have chosen and modified a few items from other questionnaires to assess how often individuals compare their appearance to others on social media (Fardouly et al., 2017; Fardouly, Magson, et al., 2018; Fardouly & Vartanian, 2015), but no validated questionnaires have been developed to measure social media appearance comparisons.

Also considering the importance of social comparisons in the relationship between SNSs use and body image, and in the relationship between SNSs use and self-esteem, future research could shed light on the specific role of SNSs appearance comparisons. In this line, eating disorders prevention programs

and interventions should tackle social comparisons made on social media, together with media literacy education.

The long-term impact of the pandemic should also be further studied in order to implement strategies to mitigate the detrimental mental health adverse effects. For example, it is known that people who lost their jobs and suffered income shocks during the first months of the pandemic had particularly sharp deteriorations in mental health, and there is also evidence that healthcare workers have been particularly affected by the mental health consequences of COVID-19 (Banks et al., 2021). Hence, special attention should be paid to the needs of those groups in positions of greater vulnerability.

Finally, qualitative and mixed-methods approaches should probably be used to a greater extent both in the field studying the relationship between SNSs use and body image and in the research area that tackles the mental health aspects associated with the COVID-19 pandemic. As expressed by Sladek (2017), qualitative methods pose several advantages and, when combined with quantitative techniques, they can help to better understand a topic of study and conduct stronger research. In this regard, in the context of a research stay, I had the chance to collaborate with the Physical Appearance Research Team of the University of Melbourne in a study that aims to qualitatively explore how body neutrality is presented in TikTok videos, using a reflexive thematic analysis approach. This research will contribute to expanding the knowledge on the (appearance-focused) use of SNSs. As mentioned in the Introduction of this thesis, taking into account the negative impact of viewing content on SNSs that promotes the beauty and thin ideal, some researchers have started to examine social media content that is supposedly aimed at promoting a more positive body image. This includes the body positivity movement, which seeks to challenge the narrowly-defined beauty ideals through positive portrayals of diverse body shapes and sizes, and has been studied in several articles (Brathwaite & DeAndrea, 2022; Caruso & Roberts, 2018; Cohen et al., 2021; Cohen, Fardouly, et al., 2019; Cohen, Irwin, et al., 2019; Davies et al., 2020; Lazuka et al., 2020; Sastre, 2014; Stevens & Griffiths, 2020; Tiggemann et al., 2020; Vendemia et al., 2021). Some authors have questioned whether the body positive movement might ultimately lead to more self-objectification than viewing appearance-neutral content (Cohen,

Fardouly, et al., 2019). In this context, *body neutrality* emerged as a movement that aims to reduce the value and relevance placed on one's appearance for their self-worth. It could be conceptualised as a "middle ground" between the polarising messages of loving or hating one's body. Apart from examining the body neutrality movement from a qualitative perspective, there are many other areas related to this thesis' topic that could benefit from qualitative research. For example, a content analysis of TikTok videos or Instagram posts that focus both on the pandemic and on body image-related aspects could be performed.

To conclude, we consider this thesis has added relevant evidence for research and clinical practice that might be expanded in future studies in light of the limitations and suggestions mentioned in the previous paragraphs.

CONCLUSIONS

5. Conclusions

The main conclusions of the thesis can be summarized as follows:

1. The COVID-19 pandemic and its associated lockdown have been linked with increased levels of depression, anxiety and stress, together with several perceived changes in different life areas (e.g., changes in sleep quality, physical activity, eating habits, self-caring time, concerns about one's future, health concerns, and social relationships).
2. There has probably been an increase in women's body dissatisfaction and appearance comparisons across the pandemic. According to our findings, this increase has been especially relevant in women who were not at risk of having an eating disorder before the pandemic onset, in comparison to those who were already at risk of having an eating disorder. These results suggest that women's general population might have been affected to a greater extent to the detrimental effects of the pandemic to body image compared to women who already presented eating disturbances before the pandemic.
3. The frequency of use of SNSs and the number of women following appearance-focused accounts on Instagram might have increased during the lockdown period. However, we found inconsistent results across our studies in this regard, suggesting that the differences in research designs and cofounding factors might influence these findings.
4. There are differences in the effects of the pandemic across different population subgroups. For example, women and young people might have been affected to a greater extent compared to other populations.
5. The frequency of use of Instagram and an appearance-focused use of Instagram during the lockdown period was associated with body image disturbance. Similarly, following appearance-focused accounts on Instagram and a higher frequency of use of Instagram seems to predict higher levels of drive for thinness.
6. An increase or decrease in Instagram use throughout the pandemic, or the fact of starting to follow or unfollow appearance-focused accounts

on Instagram, does not seem to be necessarily associated with higher or lower levels of body dissatisfaction or appearance comparisons.

7. Our validated version of the Spanish PACS-R can be a useful tool for clinicians and researchers to assess appearance comparisons in community populations, in both women and men of a wide range of ages.
8. Appearance comparisons predict body dissatisfaction and disordered eating, and they play a key role in the relationship between SNSs use and body image disturbance.

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APPENDICES

7. Appendices

7.1. Appendix 1. Research ethics approval certificates

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08028 Barcelona

Comisión de Bioética
de la Universitat de Barcelona

Certificado de aprobación
Sobre experimentación en humanos o en muestras de origen humano

Don Albert Royes Qui, Secretario de la Comisión de Bioética de la Universitat de Barcelona.

CERTIFICA:

Que la Dra. **Carmina Saldaña García** presentó el proyecto titulado **"Relación entre el uso de redes sociales y la imagen corporal"**

La Comisión de Bioética de la Universitat de Barcelona analizó toda la documentación presentada por la Dra. **Carmina Saldaña García** y, por acuerdo de fecha 16 de noviembre de 2018, aprobó informar favorablemente desde el punto de vista bioético el proyecto de investigación de referencia.

Y para que conste y a los efectos que corresponda, firmo este documento con el visto bueno del presidente de la Comisión en Barcelona a 16 de noviembre de 2018

Universitat de Barcelona

Comissió de Bioètica

Vº Bº El presidente de la Comisión de Bioética de la Universitat de Barcelona

Domènec Espriu Climent

UNIVERSITAT DE BARCELONA
Oficina de Gestió de la Recerca
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Director de Recerca

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08028 Barcelona

Comisión de Bioética
de la Universitat de Barcelona

Certificado de aprobación
Sobre experimentación en humanos o en muestras de origen humano

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Don Albert Royes Qui, Secretario de la Comisión de Bioética de la Universitat de Barcelona.

CERTIFICA:

Que la Dra. **Carmina Saldaña García** presentó el proyecto titulado "Relación entre el uso de redes sociales y la imagen corporal"

La Comisión de Bioética de la Universitat de Barcelona analizó toda la documentación presentada por la Dra. **Carmina Saldaña García** y, por acuerdo de fecha 19 de diciembre de 2019, aprobó informar favorablemente desde el punto de vista bioético el proyecto de investigación de referencia.

Y para que conste y a los efectos que corresponda, firmo este documento con el visto bueno del presidente de la Comisión en Barcelona a 19 de diciembre de 2019.

Universitat de Barcelona
Comissió de Bioètica

Vº Bº El presidente de la Comisión de Bioética de la Universitat de Barcelona

Domènec Espriu Climent

Institutional Review Board (IRB00003099)

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COMISSIÓ DE BIOÈTICA DE LA UNIVERSITAT DE BARCELONA

CERTIFICADO DE APROBACION

SOBRE EXPERIMENTACIÓN EN SERES HUMANOS, EN MUESTRAS DE ORIGIEN HUMANO, OBSERVACION DE SERES HUMANOS O INTERVENCIONES SOCIALES CON SERES HUMANOS.

Albert Royes Qui, Secretario de la Comissió de Bioètica de la Universitat de Barcelona.

CERTIFICA:

Que la Dra. **Carmina Saldaña García** presentó el proyecto titulado "Impacto de la pandemia de la COVID-19 en el uso de redes sociales e imagen corporal, y el bienestar psicológico".

La Comissió de Bioètica de la Universitat de Barcelona analizó toda la documentación presentada por la Dra. **Carmina Saldaña García** y, por acuerdo de fecha 14 de mayo de 2020, aprobó informar favorablemente desde el punto de vista bioético el proyecto de investigación de referencia.

Y para que conste y a los efectos que corresponda, firmo este documento con el visto bueno del presidente de la Comisión en Barcelona, a 20 de mayo de 2020.

Universitat de Barcelona

Comissió de Bioètica

Vº Bº El presidente de la Comissió de Bioètica de la Universitat de Barcelona

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7.2. Appendix 2. Spanish translations of the abstracts of the articles

Study 1: *Validation of the Spanish version of the Physical Appearance Comparison Scale-Revised (PACS-R): Psychometric properties in a mixed-gender community sample*

Título

Validación española de la "Escala de comparación de la apariencia física" (PACS-R): Propiedades psicométricas en una muestra comunitaria de hombres y mujeres

Resumen

Los objetivos de este estudio fueron examinar la validez y la fiabilidad de la versión española de la "Escala de comparación de la apariencia física-revisada" (*Physical Appearance Comparison Scale-Revised*; PACS-R) y evaluar su capacidad predictiva de la insatisfacción corporal y las alteraciones alimentarias en una muestra comunitaria española. 1405 participantes (83,6% mujeres; de entre 14 y 64 años) completaron la PACS-R y también medidas de imagen corporal, alteraciones alimentarias, influencias socioculturales relacionadas con la apariencia física, autoestima y comparación social. Los análisis factoriales exploratorio y confirmatorio apoyaron la estructura unidimensional original para la versión española de 11 ítems de la PACS-R. Las mujeres mostraron puntuaciones significativamente más elevadas que los hombres. Se halló una consistencia interna excelente, buena fiabilidad test-retest y buena validez convergente. Los análisis de regresión demostraron la utilidad de la escala para predecir la insatisfacción corporal y las alteraciones alimentarias tanto en hombres como en mujeres. Las excelentes propiedades psicométricas de la PACS-R la convierten en una herramienta útil para medir las comparaciones de la apariencia física en personas de habla española.

Palabras clave

PACS-R, comparación de la apariencia, imagen corporal, medida, validación española, propiedades psicométricas.

Study 2: *The impact of COVID-19 pandemic and lockdown measures on eating disorder risk and emotional distress among adolescents and young people in Spain*

Título

El impacto de la pandemia por COVID-19 y del confinamiento en las alteraciones alimentarias y el malestar emocional en adolescentes y jóvenes de España

Resumen

El objetivo de este estudio fue determinar el impacto psicológico del confinamiento por COVID-19 en una muestra comunitaria española. 2847 participantes de entre 14 y 35 años (95% mujeres) completaron medidas de depresión, ansiedad, estrés, autoestima y alteraciones alimentarias. Considerando la pequeña proporción de hombres y al hallar diferencias significativas entre sexos, la mayoría de resultados fueron informados solo para las mujeres. Un 30,8%, 25,4% y 20,5% de la muestra presentó niveles graves o muy graves de depresión, ansiedad y estrés respectivamente. La calidad del sueño, los hábitos alimentarios, las preocupaciones por la apariencia física, por el futuro y por la salud habían empeorado a raíz del confinamiento. Una menor edad, no tener pareja, el desempleo, no haber contraído COVID-19 o no estar seguro de ello, el fallecimiento de un ser querido por COVID-19, y no tener un lugar donde relajarse fueron factores asociados al malestar psicológico y las alteraciones alimentarias. El análisis de ecuaciones estructurales confirmó la influencia directa de las variables relacionadas con el confinamiento en la psicopatología. Esto sugiere que la pandemia puede haber tenido un impacto significativo en la salud mental y en la conducta alimentaria.

Palabras clave

COVID-19, alteraciones alimentarias, depresión, ansiedad, estrés, malestar emocional.

Study 3: *The impact of COVID-19 lockdown on social network sites use, body image disturbances and self-esteem among adolescent and young women*

Título

El impacto del confinamiento por COVID-19 en el uso de redes sociales, las alteraciones de la imagen corporal y la autoestima en mujeres adolescentes y jóvenes

Resumen

Objetivo: el objetivo de este estudio fue determinar el impacto del confinamiento por COVID-19 en el uso de redes sociales (*social network sites,* SNSs) y explorar si el uso de SNSs se asocia con alteraciones de la imagen corporal y la baja autoestima.

Método: un total de 2601 mujeres residentes en España con edades comprendidas entre los 14 y los 35 años completaron cuestionarios de uso de SNSs, autoestima, insatisfacción corporal y obsesión por la delgadez. La encuesta incluyó preguntas sobre el uso de SNSs que hacían referencia tanto al momento de responder a la encuesta como a antes del confinamiento.

Resultados: se halló un aumento estadísticamente significativo en la frecuencia de uso de todas las SNSs estudiadas (Instagram, Youtube, TikTok, Twitter y Facebook) durante el confinamiento, así como en el número de mujeres que seguían cuentas de Instagram centradas en la apariencia. Además, se encontraron relaciones estadísticamente significativas entre la frecuencia de uso de Instagram y la insatisfacción corporal, la obsesión por la delgadez y la baja autoestima en el grupo más joven (14-24 años), y entre la frecuencia de uso de Instagram y la obsesión por la delgadez en el grupo de mayor edad (25-35 años). El hecho de seguir cuentas centradas en la apariencia en Instagram se relacionó de manera significativa con la insatisfacción corporal y la obsesión por la delgadez en el grupo de menor edad, y solamente con la obsesión por la delgadez en el grupo de mayor edad. Una mayor frecuencia de uso de Instagram y el seguimiento de cuentas centradas en la apariencia en Instagram predijeron significativamente niveles más elevados de obsesión por la delgadez.

Conclusión: los resultados sugieren que el confinamiento por COVID-19 ha tenido un impacto en el uso de SNSs, y esto podría traducirse en un mayor deseo de delgadez y mayor riesgo de desarrollar un trastorno de la conducta alimentaria entre las mujeres adolescentes y jóvenes.

Palabras clave

COVID-19, redes sociales, imagen corporal, autoestima, trastornos de la conducta alimentaria.

Study 4: *Women's body dissatisfaction, physical appearance comparisons, and Instagram use throughout the COVID-19 pandemic: A longitudinal study*

Título

Insatisfacción corporal, comparación de la apariencia física y uso de Instagram en mujeres a lo largo de la pandemia por COVID-19: un estudio longitudinal

Resumen

Objetivo: este estudio tuvo como objetivo determinar la evolución del uso de Instagram, la insatisfacción corporal y las comparaciones de la apariencia física a lo largo de la pandemia por COVID-19, y explorar si existe relación entre los cambios en el uso de Instagram a lo largo de la pandemia y la insatisfacción corporal y las comparaciones de la apariencia física.

Método: un total de 272 mujeres españolas (16-70 años) fueron encuestadas en cuatro momentos temporales, entre noviembre de 2019 (antes del inicio de la pandemia) y julio de 2021 (T1, T2, T3 y T4). En cada seguimiento se evaluaron la insatisfacción corporal, las comparaciones de la apariencia física y el uso de Instagram, a través del *Eating Disorders Inventory-3*, la *Physical Appearance Comparison Scale-Revised*, y un cuestionario creado *ad hoc* sobre el uso de Instagram, respectivamente.

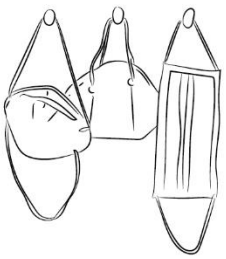
Resultados: no se encontraron cambios estadísticamente significativos en la frecuencia de uso de Instagram, ni en la proporción de mujeres siguiendo a cuentas centradas en la apariencia en Instagram, entre los diferentes momentos de recogida de datos. La insatisfacción corporal aumentó

significativamente del T1 al T4, y las comparaciones de la apariencia física aumentaron significativamente del T1 a T2, T3 y T4. Estos aumentos no fueron estadísticamente significativos para las mujeres con riesgo previo de trastorno de la conducta alimentaria. No se hallaron diferencias estadísticamente significativas en la insatisfacción corporal y las comparaciones de la apariencia física en función de si la frecuencia de uso de Instagram de las participantes había cambiado o permanecido igual a lo largo de la pandemia, o de si habían empezado a seguir cuentas centradas en la apariencia en Instagram, lo habían dejado de hacer, o se habían mantenido igual, durante la pandemia.

Conclusión: la insatisfacción corporal y la comparación de la apariencia física de las mujeres parecen haber aumentado a lo largo de la pandemia. Las experiencias vividas por las personas con alteraciones de la conducta alimentaria, y la relación entre la pandemia y el uso de Instagram, son complejas y requieren de más investigación.

Palabras clave

Comparación de la apariencia, insatisfacción corporal, imagen corporal, COVID-19, trastornos de la conducta alimentaria, Instagram, longitudinal, redes sociales.



Barcelona, May 2023