Tesis Doctoral

Influencias socioculturales y conductas de modificación del cuerpo en adolescentes varones

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PRESENTACIÓN

La tesis doctoral que se presenta a continuación es un compendio de tres publicaciones realizadas en revistas indexadas y con factor de impacto. Los tres artículos se enmarcan dentro de los proyectos MABIC I y II, que incluyen un estudio para evaluar la efectividad de un programa de prevención de problemas relacionados con la alimentación y el peso en adolescentes, financiado por el Ministerio de Ciencia e Innovación en España (PSI2009-08956), y un estudio prospectivo de factores de riesgo de estos problemas en adolescentes, financiado por el Ministerio de Economía y Competitividad (PSI2012-31077).

El primer artículo (Sánchez-Carracedo, Barrada, et al., 2012), presenta la validación española con población adolescente de un instrumento de evaluación de influencias socioculturales relacionadas con el ideal de belleza corporal, el *Sociocultural Attitudes Toward Appearance Questionnaire-3 (SATAQ-3)*. Este estudio fue publicado en la revista *Body Image* (factor de impacto año 2011: 1.900).

El segundo artículo (Almenara, Fauquet, López-Guimerà, Pamias Massana, & Sánchez-Carracedo, 2014), tuvo como objetivo explorar el efecto del estatus de peso percibido sobre la práctica de dieta y conductas no saludables de control del peso en adolescentes varones españoles, considerando su estatus de peso corporal. Este artículo fue publicado en la revista *Nutrición Hospitalaria* (factor de impacto año 2013: 1.250).

Finalmente, el tercer artículo tuvo como objetivo examinar la asociación entre las influencias socioculturales y las conductas de modificación del cuerpo en adolescentes españoles varones de diferente estatus de peso corporal. Este artículo ha sido publicado en la revista *Eating Behaviors* (factor de impacto año 2013: 1.329).

INTRODUCCIÓN

1.1 PARTE I: Consideraciones generales

1.1.1 La necesidad de una perspectiva más amplia en el estudio de los problemas relacionados con la alimentación y el peso

Los problemas relacionados con la alimentación y el peso son un espectro de actitudes, conductas y trastornos relacionados con la alimentación, la actividad física, el peso y la imagen corporal. La prevalencia y consecuencias de los problemas graves, tales como la obesidad o los trastornos de la conducta alimentaria, ameritan su estudio.

Por ejemplo, en el año 2008, la Organización Mundial de la Salud reconoció la existencia de una epidemia global de obesidad (James, 2008) y se calcula que desde 1980 la prevalencia de sobrepeso y obesidad en países desarrollados se ha incrementado sustancialmente en niños y adolescentes. Así, en el 2013 un 23.8% de varones y un 22.6% de mujeres tenían sobrepeso u obesidad, en comparación con un 16.9% y 16.2% respectivamente, en 1980 (Ng et al., 2014). Particularmente en España, esta misma prevalencia es bastante alta, estando en torno al 27.6% en varones y 23.8% en mujeres (Ng et al., 2014). Lamentablemente, la obesidad se relaciona con diferentes enfermedades y problemas médicos tales como la diabetes tipo-II, la hipertensión, el síndrome metabólico, el cáncer (Albu, 2012; Brunani, Capodaglio, Leonardi, & Raggi, 2013; Schröder et al., 2014), así como con un elevado riesgo de mortandad (Whitlock et al., 2009; World Health Organization, 2009). Además de problemas relacionados con la salud, la obesidad puede estar relacionada también con problemas psicosociales, tales como ser víctima de burlas, discriminación y estigma, que en conjunto afectan la salud mental y el bienestar de las

personas obesas (Gray, Kahhan, & Janicke, 2009; Latner, Puhl, & Stunkard, 2012; Puhl & Heuer, 2010; Ul-Haq, Mackay, Fenwick, & Pell, 2013).

Para el caso de los trastornos de la conducta alimentaria, la prevalencia en adolescentes no es tan alta como la obesidad (Pinhas & Bondy, 2012; Rosenvinge & Pettersen, 2014; Smink, van Hoeken, & Hoek, 2012). Por ejemplo, en España se ha encontrado una prevalencia de trastornos de la conducta alimentaria en adolescentes de hasta alrededor del 3% (Peláez Fernández, Labrador, & Raich, 2007; Peláez Fernández, Raich, & Labrador, 2010; Rojo-Moreno et al., 2003). Sin embargo, como bien se ha señalado en diferentes estudios, no todos los adolescentes cumplen los criterios diagnósticos de los trastornos de la conducta alimentaria, por lo que la prevalencia se incrementaría si se incluyen las formas atípicas (e.g. Chamay-Weber, Narring, & Michaud, 2005; Larrañaga, Docet, & García-Mayor, 2012), y particularmente si se aplican los últimos criterios diagnósticos del *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*, que son criterios más laxos (Smink et al., 2012). En todo caso, estas formas más comunes de trastornos de conducta alimentaria tienden a tener un curso crónico (Stice, Marti, & Rohde, 2013), tienden a presentar comorbilidad con otros trastornos mentales y su hospitalización supone un costo económico (Lopez-de-Andres et al., 2010). Finalmente, los trastornos de conducta alimentaria tienen un elevado riesgo de mortalidad (Arcelus, Mitchell, Wales, & Nielsen, 2011; Smink et al., 2012).

Lamentablemente, las estrategias de prevención de estos trastornos tienden a ignorar tanto el hecho de que las conductas de riesgo para la salud no ocurren de manera aislada como el hecho de que su prevención puede ser integrada (Hale, Fitzgerald-Yau, & Viner, 2014). Así por ejemplo, diversos estudios han puesto en evidencia que, en lugar de dirigir los esfuerzos de prevención sólo hacia la obesidad, es posible realizar intervenciones integradas

destinadas a prevenir también los trastornos de la conducta alimentaria (Irving & Neumark-Sztainer, 2002; Neumark-Sztainer, 2005; Sánchez-Carracedo, Neumark-Sztainer, & López-Guimerà, 2012). En parte, ello se debe a que la obesidad y trastornos de la conducta alimentaria comparten factores de riesgo tales como la dieta para bajar de peso o la insatisfacción corporal (Haines & Neumark-Sztainer, 2006; Neumark-Sztainer et al., 2007). Es así como surge la idea de desarrollar una aproximación integrada al estudio de los problemas relacionados con la alimentación y el peso, es decir, del espectro de actitudes, conductas y trastornos relacionados con la alimentación, la actividad física, el peso y la imagen corporal.

Sin embargo, la mayoría de estudios que siguen esta perspectiva integrada han sido realizados en países como Estados Unidos. En España este tipo de estudios son aún muy escasos, pero se considera que son necesarios para poder evaluar si esta perspectiva es también apropiada en este país (López-Guimerà et al., 2013). Por otro lado, los estudios sobre problemas relacionados con la alimentación y el peso en España se han centrado mayoritariamente en la obesidad o en los trastornos de la conducta alimentaria, especialmente en población femenina en este último caso, suponiendo esta última cuestión un claro sesgo de género.

Así por ejemplo, pocos estudios se han dirigido a examinar en varones adolescentes conductas de modificación del cuerpo tales como el ejercicio para incrementar la musculatura. Este tipo de conductas están generalmente asociadas a problemas relacionados con la imagen corporal, tal como la insatisfacción corporal, y su prevalencia no se ha de desestimar. Por ejemplo, estudios de revisión han encontrado que entre un 21.2% y un 47% de adolescentes varones informan realizar conductas para incrementar el peso y/o musculatura (Cafri et al., 2005; Ricciardelli & McCabe, 2007), mientras que otros estudios

refieren que entre un 7.5% y un 30.5% reportan conductas para bajar de peso (Centers for Disease Control and Prevention, 2010; Ojala et al., 2007; Ricciardelli & McCabe, 2004). Así mismo, algunos autores refieren una prevalencia de insatisfacción corporal en adolescentes varones de entre el 12% y el 26% (Paxton & McLean, 2010).

En España, la mayoría de estudios han utilizado instrumentos que miden la insatisfacción corporal en relación a desear un cuerpo más delgado (e.g. Bully, Elosua, & López-Jáuregui, 2012; Ramos Valverde, Rivera de Los Santos, & Moreno Rodríguez, 2010). Sin embargo, los pocos estudios que han evaluado la insatisfacción corporal en adolescentes varones sin este sesgo, han encontrado que hasta un 20% de ellos están preocupados por estar gordos y que al menos un 50% desean desarrollar su musculatura (Toro, Gila, Castro, Pombo, & Guete, 2005). Las conductas de modificación del cuerpo también han sido estudiadas en unas pocas investigaciones en España. Así, se ha observado que hasta un 14.2% de adolescentes varones informan hacer dieta para bajar de peso (López-Guimerà et al., 2013). Mientras que en otro estudio se encontró que un 26.3% informó modificar su dieta con el fin de incrementar de peso y/o musculatura (Toro et al., 2005).

Por lo anteriormente expuesto, consideramos oportuno que se realicen estudios con una perspectiva integrada de los problemas relacionados con la alimentación y el peso, y que se consideren además conductas específicas del sexo masculino y no sólo del sexo femenino.

1.2 PARTE II: Conductas de modificación del cuerpo en adolescentes varones

1.2.1 Conductas de control del peso

Un significativo número de estudios sugieren que el sobrepeso y la obesidad están estigmatizados, tanto por los mensajes que alertan de los riesgos para la salud de la obesidad (Puhl & Heuer, 2010; Saguy, 2013; Vartanian & Smyth, 2013), como por los mensajes que resaltan la delgadez como la principal característica del ideal de belleza corporal en la mayoría de países del mundo occidental (Dittmar, 2008; Grogan, 2008; Jung & Forbes, 2010; Levine & Smolak, 2010; Soh, Touyz, & Surgenor, 2006; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Por ello, no es realmente sorprendente que la insatisfacción corporal y las conductas de control del peso, tales como realizar dieta, sean bastante populares entre los adolescentes, particularmente entre las mujeres.

Sin embargo, hay que notar que estas conductas de control del peso se han observado también en adolescentes varones. Por ejemplo, un estudio llevado a cabo en más de 30 países encontró un promedio de 7.5% de adolescentes varones intentando bajar de peso (Ojala et al., 2007). Otro estudio más reciente, realizado en España, encontró que durante el último año un 14.2% de los adolescentes varones evaluados había realizado dieta para bajar de peso (López-Guimerà et al., 2013). Aún más interesante, este estudio encontró que el 12% de los adolescentes varones informó realizar alguna conducta de control del peso no saludable, lo que incluía conductas tales como saltarse comidas, ayunar, usar un sustituto alimenticio, fumar cigarrillos o comer muy poco. Si bien la modificación de la dieta y conductas para bajar o controlar el peso pueden ayudar a alcanzar un peso saludable, la realidad es que muchas veces los adolescentes inician estas conductas sin una supervisión profesional. Ello puede promover patrones alimentarios no saludables (Field et al., 2003), incluyendo una dieta no balanceada (Johns, Tidswell, Mcpherson, & Swift, 2009), así como

una ingesta inadecuada de nutrientes clave para el desarrollo durante esta edad (Larson, Neumark-Sztainer, & Story, 2009). Por otro lado, estas conductas pueden persistir a lo largo del desarrollo e incrementar el riesgo de desarrollar trastornos de la conducta alimentaria (Loth, MacLehose, Bucchianeri, Crow, & Neumark-Sztainer, 2014).

1.2.2 Conductas para incrementar el peso y la musculatura

De manera similar a cómo se promueven las conductas de control del peso, se ha observado que muchos individuos, particularmente del sexo masculino, perciben mensajes que promueven la tonificación de los músculos como elemento importante de las características del ideal de belleza corporal (Pope, Phillips, & Olivardia, 2002; Ricciardelli & McCabe, 2007). Es así como se ha identificado otro grupo de conductas de modificación del cuerpo destinadas a incrementar el peso y la musculatura (Cafri, van den Berg, & Thompson, 2006; Ricciardelli & McCabe, 2004, 2007). Por ejemplo, en el estudio transnacional mencionado anteriormente, un mayor número de adolescentes varones consideraba que debía ganar peso en comparación con las mujeres, mientras que un mayor número de éstas consideraba que debía bajar de peso (Ojala et al., 2007). Como se ha sugerido, estas diferencias pueden reflejar el deseo de las adolescentes por ser más delgadas, mientras que en los adolescentes reflejaría el deseo de ser más musculosos (Ricciardelli & McCabe, 2007). Gran parte de la literatura se ha centrado en el estudio de las conductas de control del peso y su relación con los trastornos de conducta alimentaria o a la obesidad, siendo pocos los estudios que han evaluado estas conductas encaminadas a ganar peso y musculatura. Sin embargo, se sabe que algunos adolescentes hacen uso de diferentes estrategias para lograr este objetivo. Por ejemplo, un estudio de revisión de la literatura encontró que entre un 21.2% y hasta un 47% de adolescentes y jóvenes adultos varones modificaba su dieta para

incrementar de peso y/o musculatura (Cafri et al., 2005). En una muestra de adolescentes varones en España este porcentaje fue del 26.3% (Toro et al., 2005). Además de la dieta, algunos adolescentes hacen uso del ejercicio, que puede llegar a ser intenso o excesivo, con el fin de incrementar volumen corporal y musculatura (Goodwin, Haycraft, & Meyer, 2014; McCabe & Ricciardelli, 2006). En España, el estudio citado anteriormente encontró que un 64.2% de adolescentes varones informó hacer alguna vez uso del ejercicio para incrementar su volumen corporal o musculatura (Toro et al., 2005). Finalmente, es de notar que, con el fin de incrementar el peso y/o musculatura, algunos adolescentes pueden estar haciendo uso de suplementos alimenticios u otras sustancias (Cafri et al., 2005; Eisenberg, Wall, & Neumark-Sztainer, 2012), sin supervisión profesional y de manera inadecuada. Muchas de estas sustancias pueden ser obtenidas a través de internet (Brennan, Kanayama, & Pope, 2013) y, si bien el uso de esteroides es bajo (Hibell et al., 2012), estas sustancias pueden ser la puerta de entrada al uso de esteroides (e.g. efedrina) u otras drogas (Hildebrandt, Harty, & Langenbucher, 2012).

1.3 PARTE III: El modelo sociocultural y las influencias socioculturales en el desarrollo de problemas relacionados con la alimentación y el peso

El modelo sociocultural analiza la conducta humana focalizándose "en el contexto cultural y como éste influye en la conducta individual" (Jackson, 1992, p. 35). Este modelo ha sido ampliamente utilizado para explicar el origen de problemas relacionados con la alimentación y el peso, incluyendo el origen de conductas de modificación del cuerpo como la dieta hasta problemas más complejos como los trastornos de la conducta alimentaria. En la mayoría de estos estudios se ha observado que las influencias socioculturales, tales como los

mensajes promovidos por los medios de comunicación (e.g. imágenes de mujeres muy delgadas), los padres y los pares, influyen en la percepción que tenemos de nuestro propio cuerpo y pueden promover así conductas encaminadas a modificar la apariencia de nuestro cuerpo (Thompson et al., 1999).

Los elementos esenciales de estas influencias socioculturales son tres: la existencia de un ideal de belleza corporal predominante, las presiones socioculturales que promueven este ideal y la interiorización de este ideal de belleza. A continuación presentamos estos tres elementos.

1.3.1 El ideal de belleza corporal masculina

Estudios que han examinado la representación del cuerpo masculino a través de los últimos años, han observado una tendencia hacia el incremento de la musculatura masculina. Así por ejemplo, cuando se han comparado los muñecos de acción de distintos años, se ha observado un notable incremento en sus niveles de musculatura (Pope, Olivardia, Gruber, & Borowiecki, 1999). De manera similar, a través de los años, revistas populares como *Cosmopolitan* han ido incluyendo cada vez más imágenes de modelos masculinos y durante los últimos años es muy común ver en estas revistas hombres musculados (Leit, Pope, & Gray, 2001; Pope, Olivardia, Borowiecki III, & Cohane, 2001).

Si bien puede decirse que existen diferentes ideales de belleza corporal masculina, existe evidencia de que actualmente un cuerpo musculado es el ideal predominante. Específicamente, este ideal está caracterizado por ser de tipo mesomórfico, es decir, con poco porcentaje de grasa corporal y a la vez con visible, pero no excesivamente exagerada, musculatura (Cohane & Pope, 2001; Mishkind, Rodin, Silberstein, & Striegel-Moore, 1986; Tylka, 2011). La preferencia por este ideal de belleza corporal se observa comúnmente en

países occidentales e industrializados, incluyendo España (Toro et al., 2005). Sin embargo, de manera similar al ideal de belleza corporal femenina (Swami et al., 2010), existe cierta evidencia de que la preferencia por este ideal masculino se está diseminando en otras culturas (Gray & Ginsberg, 2007; Ricciardelli, McCabe, Williams, & Thompson, 2007). La principal razón de esta diseminación, de acuerdo al modelo sociocultural (Thompson et al., 1999), serían las presiones socioculturales.

1.3.2 Las presiones socioculturales hacia la adopción de un ideal de belleza corporal

De acuerdo al modelo sociocultural (Thompson et al., 1999), muchos adolescentes varones prefieren este ideal de belleza corporal debido a las presiones socioculturales ejercidas particularmente por tres importantes agentes sociales: los medios de comunicación, la familia y los pares. De hecho, el modelo sociocultural es llamado también modelo de influencia tripartita justamente porque son estos tres elementos los de principal influencia (Tiggemann, 2011).

El estudio más emblemático sobre la influencia de los medios de comunicación en el desarrollo de alteraciones alimentarias fue aquel liderado por Anne Becker. Durante su investigación observó que, tras la introducción de la televisión en las islas Fiji entre los años 1995 y 1998, el 83% de las chicas adolescentes participantes en el estudio afirmó que la televisión había influenciado en sus actitudes hacia su propio peso y figura corporal (Becker, Burwell, Gilman, Herzog, & Hamburg, 2002). Específicamente, tras la introducción de la televisión, las participantes refirieron menor satisfacción corporal y el deseo de modificar su apariencia corporal. Así mismo, la dieta y ejercicio para bajar de peso, así como conductas extremas de control del peso como el vómito autoinducido, que no se practicaban antes,

comenzaron a ser prácticas cada vez más comunes (Becker et al., 2002). Si bien no existe un estudio similar con adolescentes varones, existe evidencia de que los medios de comunicación, además de ser una fuente de presión sociocultural para las mujeres (López-Guimerà, Levine, Sánchez-Carracedo, & Fauquet, 2010), es también una fuente de presión sociocultural para los hombres. Así por ejemplo, un estudio meta-analítico encontró que la exposición a mensajes de medios de comunicación, en los que se enfatiza un ideal muscular masculino, se asocia a insatisfacción corporal y a una mayor probabilidad de realizar conductas de modificación del cuerpo tales como ejercicio excesivo (Barlett, Vowels, & Saucier, 2008). Sin embargo, ha de notarse que esta asociación y el efecto que pueden tener los medios de comunicación parece ser mayor en individuos proclives a realizar este tipo de conductas (Ferguson, 2013; Hausenblas et al., 2013). En otras palabras, la relación entre exposición a los medios de comunicación y conductas de modificación del cuerpo, estaría mediada por factores psicológicos tales como el nivel de interiorización de estos ideales socioculturales, del cual hablaremos más adelante.

De manera similar, la familia constituye una fuente importante de presión sociocultural. La familia contribuye de una forma exclusiva y particular en la manera cómo experimentamos nuestra propia apariencia física, así como en nuestros valores, actitudes y conductas asociadas a ella (Bellew, 2012). Por ejemplo, los padres pueden fomentar en sus hijos varones conductas de modificación del cuerpo tales como la dieta para bajar de peso (Wertheim, Martin, Prior, Sanson, & Smart, 2002), estrategias para incrementar de peso y tono muscular tales como el uso de suplementos alimenticios (McCabe & Ricciardelli, 2001), entre otros. De hecho, estudios longitudinales han encontrado que estas presiones familiares predicen el uso de suplementos alimenticios (Ricciardelli & McCabe, 2003), el ejercicio compulsivo para incrementar la musculatura (Goodwin et al., 2014), e insatisfacción corporal

(Helfert & Warschburger, 2011). Finalmente, una revisión sobre el tema sugiere que, más que el modelado de la conducta por parte de los padres, lo que más influye en el grado de satisfacción corporal y en la adopción de conductas de modificación del cuerpo son los mensajes que los padres dan a sus hijos y la manera activa como fomentan estas conductas (Rodgers & Chabrol, 2009). Este estudio encontró además que las presiones socioculturales son el mayor factor de predicción de insatisfacción corporal en varones adolescentes.

Finalmente, los pares son también una fuente de presión sociocultural. Así como los padres, los pares también pueden fomentar conductas de modificación del cuerpo tales como la dieta para bajar de peso o el ejercicio intenso para incrementar la musculatura, entre otros (Goodwin et al., 2014; Helfert & Warschburger, 2011; McCabe & Ricciardelli, 2001; Ricciardelli & McCabe, 2003). Sin embargo, ha de notarse que las presiones ejercidas por los pares están inmersas dentro de la complejidad de las relaciones de pares. Estas relaciones comprenden interacciones discretas que varían de individuo a individuo, de interacción a interacción y de contexto a contexto (Fabes, Martin, & Hanish, 2009). Por lo tanto, los pares pueden influir en la percepción del propio cuerpo así como en la conducta a través de diferentes mecanismos, tales como las comparaciones sociales, las burlas relacionadas con el peso y la figura corporal, el modelado de conductas de control del peso, y las conversaciones sobre el peso y la figura corporal, entre otros (Eisenberg, Wall, Shim, et al., 2012; Haines, Hannan, van den Berg, Eisenberg, & Neumark-Sztainer, 2013; Helfert & Warschburger, 2013; Jones & Crawford, 2006; Myers & Crowther, 2009; Rojo-Moreno et al., 2013; Webb, Zimmer-Gembeck, & Donovan, 2014; Webb & Zimmer-Gembeck, 2014).

1.3.3 La interiorización del ideal de belleza corporal

La interiorización es el proceso a través del cual los individuos incorporan mensajes relativos al ideal sociocultural de belleza corporal, particularmente los estándares socioculturales que definen lo que es una apariencia física atractiva (Thompson et al., 1999; Thompson & Stice, 2001). Este proceso cognitivo implica por lo tanto la incorporación de estos mensajes o estándares dentro del propio sistema de creencias, influenciando como consecuencia los propios valores y actitudes, y dando lugar a esquemas cognitivos específicamente relacionados a la apariencia física. Como se mencionó anteriormente, la relación entre las presiones socioculturales y las conductas de modificación del cuerpo no es directa, sino que más bien estaría mediada por otras variables tales como la interiorización. Así por ejemplo, algunos estudios sugieren que las presiones socioculturales predicen la interiorización, la cual a su vez puede directamente promover conductas de modificación del cuerpo o indirectamente cuando se considera el nivel de insatisfacción corporal (Tylka, 2011).

1.4 PARTE IV: Vacíos y limitaciones en la literatura previa

1.4.1 Las experiencias varían de acuerdo al estatus de peso corporal

Un hallazgo interesante en la literatura sobre la imagen corporal es que las experiencias de los adolescentes varían de acuerdo al estatus de peso corporal. Mientras que muchas mujeres adolescentes están insatisfechas con su cuerpo y, independientemente de su estatus de peso corporal, desean ser más delgadas, los hombres adolescentes por el contrario tienden a estar divididos entre aquellos que desean bajar de peso y aquellos que desean ganar

peso. Esto bien puede reflejar las diferencias de género en cuanto al ideal de belleza corporal (Fawkner, 2012). Por un lado, tal y como se deduce de estudios previos (Swami et al., 2010), el ideal de delgadez femenino influye en la percepción del propio cuerpo y en la preferencia por un cuerpo delgado. En contraste, la influencia del ideal corporal mesomórfico divide a los hombres que se encuentran lejos de este ideal entre aquellos que desean bajar de peso y aquellos que desean ganar peso, ambos intentando emular la apariencia musculada de este ideal (Ricciardelli & McCabe, 2007). Así, muchos estudios han encontrado una curva en forma de "U" en la correlación que existe entre insatisfacción corporal y estatus de peso corporal en adolescentes varones, indicando que los más insatisfechos con su cuerpo son aquellos con bajo peso y sobrepeso (Caccavale, Farhat, & Iannotti, 2012; Cortese et al., 2010; Kostanski, Fisher, & Gullone, 2004; Presnell, Bearman, & Stice, 2004).

Por otro lado, se ha observado que tanto los adolescentes varones de bajo peso como los de sobrepeso, cuya apariencia corporal está bastante alejada del ideal mesomórfico, tienden a ser víctimas de comentarios negativos o burlas en relación a su apariencia (Jones & Crawford, 2006), tienden a ser menos populares entre sus pares (McCabe, Ricciardelli, & Finemore, 2002), y a ser marginados en las actividades sociales y deportivas con sus pares (Helfert & Warschburger, 2011; Ricciardelli, McCabe, & Ridge, 2006). Esta situación es particularmente notoria entre los adolescentes obesos que por lo general sufren la discriminación y estigmatización relacionadas con la obesidad (Brownell, 2005; Harriger & Thompson, 2012; Latner et al., 2012; Rhode, 2010).

Lamentablemente, se sabe muy poco de cómo las influencias socioculturales varían de acuerdo al estatus de peso corporal de adolescentes varones y mucho menos en adolescentes en España. Dada la amplia investigación sobre el ideal de delgadez femenino y su relación con los trastornos de la conducta alimentaria, más prevalentes en mujeres (e.g.

Stice & Shaw, 2002), los investigadores han focalizado sus estudios en las conductas de control del peso, prestando menos atención a las conductas para ganar peso y musculatura que son más comunes en el sexo masculino. Por ello, para llenar este vacío en el conocimiento, algunos autores han sugerido la necesidad de evaluar las conductas de modificación del cuerpo en adolescentes de diferente estatus de peso corporal (McCabe & Ricciardelli, 2009).

1.4.2 La medición y percepción del estatus de peso corporal

Otra consideración para la realización de nuestros estudios fue la medición del estatus de peso corporal. En general, se ha observado que los adolescentes, cuando informan sobre su talla y peso, tienden a infravalorar su peso y sobreestimar su talla (fenómeno llamado 'síndrome de pendiente plana'), siendo más precisos al informar de su talla (Béghin et al., 2013). Además, se ha observado que, cuando se considera el sexo, existen diferencias al informar del propio peso cuando se comparan hombres y mujeres. Así, los adolescentes varones por lo general infravaloran su peso y las mujeres lo sobreestiman, tal y como se ha observado en estudios en España (Farré Rovira, Frasquet Pons, Martínez Martínez, & Romá Sánchez, 2002), y otros países (Park, 2011; Quick et al., 2014). Es por ello que, aunque el autoinforme de la talla y peso es comúnmente utilizado en estudios epidemiológicos por su simplicidad (Fonseca et al., 2010), sería preferible hacer uso de mediciones exactas de la talla y el peso para una correcta clasificación del estatus de peso corporal.

Por otro lado, es interesante observar que, si bien se puede tener una medición exacta del peso y talla corporal, la percepción que tienen los adolescentes de su estatus de peso corporal puede ser distinta a la real y estar influenciada por factores socioculturales. Por ejemplo, un joven adolescente puede ser clasificado con normopeso de acuerdo a la

medición exacta de su talla y peso, pero percibirse con bajo peso debido a influencias socioculturales, tal y como sugieren diversos estudios (Johnson, Stewart, & Pusser, 2012; Lemon, Rosal, Zapka, Borg, & Andersen, 2009; Perkins, Wesley Perkins, & Craig, 2014). Finalmente, la percepción del propio cuerpo influye en la adopción de conductas de modificación del cuerpo. Así por ejemplo, un adolescente que se percibe con sobrepeso tiene mayores probabilidades de realizar dieta para bajar de peso que un adolescente que se percibe correctamente con peso normal (Quick et al., 2014).

OBJETIVOS

2.1 VALIDACIÓN DEL *SOCIOCULTURAL ATTITUDES TOWARD APPEARANCE QUESTIONNAIRE-3 (SATAQ-3)* EN ADOLESCENTES ESPAÑOLES

La primera necesidad del estudio fue de disponer de un cuestionario validado apropiado para la evaluación de las influencias socioculturales siguiendo el modelo sociocultural (Thompson et al., 1999). Si bien en España ya existe un instrumento que mide las influencias socioculturales en relación al ideal de belleza corporal (Toro, Salamero, & Martinez, 1994), este instrumento no permite establecer comparaciones con estudios internacionales. Por otro lado, es el *Sociocultural Attitudes Toward Appearance Questionnaire – 3 (SATAQ-3)* (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004), el cuestionario considerado *gold standard* para la evaluación de las presiones socioculturales y la interiorización del ideal de belleza corporal.

Es por ello que el primer objetivo general del estudio fue la validación del SATAQ-3. Específicamente, el estudio tuvo dos objetivos específicos. El primero fue evaluar la estructura factorial del SATAQ-3 con adolescentes españoles de ambos sexos. El segundo objetivo fue evaluar la invariancia de medición del instrumento para varones y mujeres de diferente grado escolar, lo cual permite valorar la posibilidad de utilizar el mismo instrumento en diferentes grupos de edad y sexo sin necesidad de realizar adaptaciones específicas. A continuación, se presenta el artículo publicado.

2.1.1 Artículo: *Analysis of the factors structure of the Sociocultural Attitudes Toward Appearance Questionnaire (SATAQ-3) in Spanish secondary-school students through exploratory structural equation modeling*

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Analysis of the factor structure of the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3) in Spanish secondary-school students through exploratory structural equation modeling

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ABSTRACT

The aims of the present study were: (1) to assess the factor structure of the SATAQ-3 in Spanish secondary-school students by means of exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and exploratory structural equation modeling (ESEM) models; and (2) to study its invariance by sex and school grade. ESEM is a technique that has been proposed for the analysis of internal structure that overcomes some of the limitations of EFA and CFA. Participants were 1559 boys and girls in grades seventh to tenth. The results support the four-factor solution of the original version, and reveal that the best fit was obtained with ESEM, excluding Item 20 and with correlated uniqueness between reverse-keyed items. Our version shows invariance by sex and grade. The differences between scores of different groups are in the expected direction, and support the validity of the questionnaire. We recommend a version excluding Item 20 and without reverse-keyed items.

Introduction

Recent reviews and meta-analyses conclude that media messages and sociocultural pressures are among the principal risk factors behind body dissatisfaction, weight concerns, and disordered eating behavior (e.g., Grabe, Ward, & Hyde, 2008; Levine & Harrison, 2004; Levine & Murnen, 2009; López-Guimerà, Levine, Sánchez-Carracedo, & Fauquet, 2010). The role of the internalization of beauty ideals as mediator between sociocultural pressures and the development of disordered eating and body dissatisfaction has been shown in numerous studies, with both women and men (e.g., Blond, 2008; Cafri, Yamamiya, Brannick, & Thompson, 2005; Durkin, Paxton, & Sorbello, 2007; Thompson & Stice, 2001). Reduction in levels of internalization is thus one of the main objectives in the field of the prevention of eating disorders (e.g., Levine & Smolak, 2006; López-Guimerà et al., 2010; López-Guimerà & Sánchez-Carracedo, 2010; Stice & Shaw, 2004; Stice, Shaw, & Marti, 2007), and appears to be a good indicator for evaluating treatment efficacy in eating disorders (Heinberg, Coughlin, Pinto, Haug, Brode, & Guarda, 2008).

Development of the SATAQ and Its Different Versions

The Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ; Heinberg, Thompson, & Stormer, 1995), in its various versions, is the instrument most widely used today for assessing these sociocultural pressures and the internalization of the beauty ideal. As such, it constitutes the gold standard in this field worldwide (López-Guimerà & Sánchez-Carracedo, 2010). Originally, the SATAQ assessed awareness of the cultural ideal of beauty for women (*Awareness* subscale) and the level of acceptance and internalization of that ideal (*Internalization* subscale). The original SATAQ was slightly modified (SATAQ-R) by adding new items that took into account the recent focus on athleticism and sports in young women (Cusumano & Thompson, 1997). The third and most recent version is SATAQ-3 (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004), a 30-item scale with four theoretical subscales. Two of these subscales are based on different internalization factors. The first, with nine items, is *Internalization-General*,

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and assesses general media influence related to TV, magazines, and movies. The second, with five items, is *Internalization-Athlete*, and assesses the internalization of athletic and sports models. The other two subscales are *Information*, with nine items, which assesses how far it is acknowledged that various media are considered important sources of information about appearance, and *Pressures*, with seven items, which assesses subjective feelings of pressure from exposure to media images and messages to modify one's appearance. The items themselves can be seen in Table 2. The response format is a Likert-type scale ranging from 1 = *completely disagree* to 5 = *completely agree*. The SATAQ-3 has shown a relatively stable internal structure, as well as boasting good indicators of reliability and validity when applied to Western women (Markland & Oliver, 2008; Thompson et al., 2004).

Considerable interest has been generated by the SATAQ and its various versions among researchers. The SATAQ has been adapted to languages such as Arabic (Madanat, Hawks, & Brown, 2006), Chinese (Jackson & Chen, 2010), French (Rousseau & Valls, 2010; Rousseau, Valls, & Chabrol, 2010), German (Knauss, Paxton, & Alsaker, 2009), and Malay (Swami, 2009). The instrument has been validated for patients with eating disorders (Calogero, Davis, & Thompson, 2004; Heinberg et al., 2008), for adolescent boys (Rousseau & Valls, 2010; Smolak, Levine, & Thompson, 2001), and for undergraduate males (Karazsia & Crowther, 2008).

The SATAQ-3: Different Structures, Versions, and Methodologies of Analysis

The original internal structure of the SATAQ-3 has not been replicated in the different versions and adaptations. A wide variety of methodological criteria have been followed to analyze the factor structure. Only the validation with Jordanian women (Madanat et al., 2006), using exploratory factor analysis (EFA) with principal axis as extraction method, replicated the four-factor structure from the original questionnaire while keeping all the items.

The French version with adolescent girls (Rousseau et al., 2010) initially found a solution of five factors. Since only Item 20 loaded on Factor 5, the four-factor solution of the original version was retained, and the authors dropped Item 20 for their version. In the French version with adolescent boys (Rousseau & Valls, 2010) an initial solution of 5 factors was again found. As no item substantially loaded in the fifth factor, the solution finally adopted was that of four factors, as in the original version. Item 20 was not cited as taking part in it and Item 18 failed to show satisfactory saturation. For both French versions, a principal components analysis (not a factor analysis) was used.

In the work with Malaysian women (Swami, 2009), an EFA was used and a solution with four factors was chosen, two of which, *Information* and *Internalization-Athlete*, mirrored the originals; the third factor was an amalgamation of the *Pressures* and *Internalization-General* factors in the original version, while the fourth factor had several items cross-loaded onto previous factors, which were eventually dropped from the analysis. Where items had relevant loadings on several factors, conceptual solutions were adopted. Items 3 and 27 were discarded from the final analysis.

The principal components analysis carried out by Calogero et al. (2004) with eating-disordered patients replicated the original four-factor solution found for a nonclinical sample, but several items cross-loaded on more than one factor. Additionally, Item 20, belonging to the *Internalization-Athlete* scale in the original version, loaded on this scale, but more strongly on *Internalization-General* (R. Calogero, personal communication, March, 15th 2011).

In the Chinese version with adolescent boys (Jackson & Chen, 2010), Item 20 was not considered in the analysis in view of its problematic performance in previous studies (Calogero et al., 2004; Markland & Oliver, 2008), and several items were modified slightly to make them gender-neutral. Two factor analyses with different samples were carried out. An initial EFA revealed a four-factor solution with dimensions reflecting *General Pressure-Internalization*, *Sources of Appearance Information*, *Pressure-Internalization of an Athletic Ideal*, and *Pressure to be Thin*. Item 1 was discarded from the analysis as it cross-loaded in two factors. This structure, without Items 1 and 20, was adopted by the authors in a subsequent confirmatory factor analysis (CFA).

Finally, the study carried out with American undergraduate males (Karazsia & Crowther, 2008) by means of a CFA replicated the original four-factor structure, but the authors did not retain the original items, rewording several items focusing on "thinness" to focus on "muscularity", so that the properties of the original version with males could not be checked. Also, for theoretical reasons, the authors decided to drop Item 15, an item referring to the internalization of the beauty ideal transmitted by music videos, from the analysis. However, Item 9, which refers to music videos as an information source for the beauty ideal, was retained.

In a footnote to the original development of the SATAQ-3, the authors recommended a new version with 8 of the 30 items reverse-keyed in order to reduce possible response bias. Most of the SATAQ-3 versions published up to now have failed to take notice of this suggestion. The only exception is the CFA carried out by Markland and Oliver (2008) with British nonclinical young women. The model with the best fit is that which excludes Item 20, the same item that performed unsatisfactorily in the versions by Calogero et al. (2004) and Rousseau et al. (2010).

Summarizing, there are four main points to highlight in the development and validation of the SATAQ-3: (a) there are different analytical approaches in the study of the internal structure; (b) versions with and without reverse-keying have been employed; (c) there are versions in which item wording has been changed for their use with certain groups (e.g., boys), so that direct comparison of scores is not possible between groups; and (d) for some versions, Item 20 has been discarded (in advance of data collection or after analysis). This may explain why the results have not been always completely congruent.

Thus, we shall examine the characteristics of a recent technique for the analysis of the internal structure of a questionnaire: exploratory structural equation modeling (ESEM; Asparouhov & Muthén, 2009), an integration of CFA and EFA.

Exploratory Structural Equation Modeling (ESEM)

We shall present the characteristics of ESEM through comparison with the main limitations of other methods for the assessment of the internal structure of tests, such as EFA and CFA. EFA is usually referred to as a data-driven technique (Fabrigar, Wegener, MacCallum, & Strahan, 1999), and is commonly used with the aim of obtaining a simple and interpretable structure. Basically, and as far as this study is concerned, there are two main limitations of EFA (e.g., Brown, 2006). First, when items share any element in their wording without theoretical relevance, they may show greater covariance than can be explained merely by their relation to the measured constructs. In these cases the interpretation of the internal structure of the questionnaire becomes complex, or actually misleading. This limitation may apply in the case of the SATAQ-3, given the strong similarity in the wording of some items and the recommendation of its authors to include items with reverse wording (Thompson et al., 2004). And, second, EFA does not permit the correct evaluation of the measurement invariance across different groups (Meredith, 1993). Measurement invariance implies that the same score has the same interpretation for the different groups. The comparability of scores between groups is not something that can be assumed by default, but rather has to be supported by evidence.

CFA is considered a theory-driven technique, as the number of dimensions and the items-factors relationship with which the covariance matrix will be explained must be supported by a strong previous theory or by previous EFAs in which a simple structure has been found. In a CFA the factor loadings are usually estimated with the restriction that each item will only load in the expected factor, the other loadings being fixed to 0. Correlated uniqueness can be included in the model in such a way that the loadings are not distorted by spurious factors or redundant items. CFAs enable the testing of measurement invariance (Vandenberg & Lance, 2000). The main limitation of CFA is the restrictive assumption: The factor structure is fully simple (Asparouhov & Muthén, 2009). While in the EFA context simple structure implies no salient loadings in the secondary dimensions, in the CFA context simple structure means no loading at all. In CFA, any non-modeled loading different from 0 in the population reduces the model fit and can bias the results. This means that some theoretically consolidated assessment instruments, supported by extensive research, do not offer an acceptable fit when modeled with a CFA (Marsh, 2007). When minor cross-loadings are fixed to 0, the correlation between dimensions is spuriously inflated. This limitation could apply to the study of the factor structure of the different versions of the SATAQ-3, given the usual finding of cross-loadings in the different EFAs (e.g., Calogero et al., 2004).

ESEM (Asparouhov & Muthén, 2009) incorporates many of the advantages of CFA, but is free of its limitations. Like EFA, ESEM permits the estimation of the factor loadings of all items in all factors, so that the problem of fixing the cross-loadings to 0 disappears. When the loading matrix of the population includes cross-loadings, ESEM recovers this matrix better than CFA and is not subject to its parameter estimation bias. As such, ESEM may be the most appropriate model for the SATAQ-3 in its various versions. Like CFA, ESEM permits the testing of measurement invariance. To date, no studies have applied ESEM to the SATAQ-3. In fact, ESEM is a very recent proposal which has not been widely used up to now (e.g., Marsh et al., 2009, 2010; Rosellini & Brown, 2011).

Purposes of the Study

This study has two main purposes. First, to evaluate the factor structure of the SATAQ-3 with adolescent girls and boys in its adaptation to Spanish. The long-overdue availability of a Spanish version of the SATAQ-3 (López-Guimerà, Sánchez-Carracedo, Fauquet, Portell, & Raich, 2011) will provide research teams from Spanish-speaking countries studying psychosocial risk factors associated with eating disorders and body image, or working in eating disorder prevention, with a validated version of an instrument that currently constitutes the gold standard for assessing some of the most relevant variables in these research fields, such as media pressures towards the beauty ideal or the internalization of that ideal. In contrast to the cases of some of the previous studies, the version of the SATAQ-3 administered follows the final wording suggested by the authors, with eight reverse-keyed items. And the second main purpose is to study the measurement invariance of the instrument for boys and girls and across the four grades of Spanish Compulsory Secondary Education. In doing so, and also in contrast to previous studies, the same wording is kept for the whole sample, avoiding the use of different (and non-comparable) questionnaires for different groups. Analysis of invariance allows comparability between different groups with the same instrument, and has become increasingly common in recent years in the field of disordered eating and body image (e.g., Fonseca-Pedrero, Sierra-Baigrie, Paino, Lemos-Giráldez, & Muñiz, 2011; Rusticus, Hubley, & Zumbo, 2008; Slof-Op't Landt et al., 2009; Warren et al., 2008).

Method

Participants

The initial sample consisted of 1559 adolescents (749 girls—48.04% and 810 boys—51.94%) recruited from 5 schools (2 public and 3 grant-aided private schools) in the area of Barcelona, Spain. Participants' ages ranged from 12 to 17 years (mean = 14.3, *SD* = 1.4). The sample comprised students from the four years of Compulsory Secondary Education in the Spanish system (7th to 10th grade in the USA). Participants were roughly equally distributed across grades: 396 (25.4%), 403 (25.8%), 392 (25.1%) and 368 (23.6%) for grades from 7th to 10th. Self-reported origin of participants was as follows: 83.4% Spanish, 7.2% Latin-American, 2.3% from other European countries (Spain excluded), 1.0% African (0.9% from North Africa and 0.1% from Sub-Saharan Africa), 5.7% mixed origins, and 0.4% who did not specify their origin. After the removal of participants with missing data (see 'Results' section), the final sample numbered 1501.

Procedures

This study is part of the pilot phase of a broader research project on the prevention of disordered eating. A battery of questionnaires about body image and eating attitudes was administered in pen-and-paper format. In this study we shall consider only data from the SATAQ-3.

The research was approved by the Clinical Research Ethics Committee of the "Parc Taulí" Health Corporation in Sabadell. Adolescents were allowed to participate only if signed parental consent was obtained. Administration of the questionnaires took place during the period from February to May 2009. Those administering the questionnaires (graduate and post-graduate psychologists) received detailed verbal and written instructions on how to proceed. The translation process was in line with international criteria (Hambleton, Merenda, & Spielberger, 2005; International Test Commission, 2010).

Data Analysis

Assessment of the internal structure took place in two distinct phases. First, we studied the internal structure of the scale following three different techniques; EFA, CFA, and ESEM. The repeated inspection of the same dataset with different techniques where the next analysis is modified according to the results from the previous analysis could lead to a capitalization on chance problem (MacCallum, Roznowski, & Necowitz, 1992). We expected this to be a minor problem in our case, given: (a) the sample size (the larger it is, the lesser the problem); and (b) that all the modifications we incorporated in our analysis were not only data-driven from the initial model, but were deeply rooted in previous results and had sound theoretical bases. In other words, the reasons that lead us to prefer the ESEM approach for modeling the SATAQ-3 could be anticipated (problems with the reverse items; problems with Item 20; some minor cross-loadings of other items—see Results section); thus, our different tested models could be defined a priori, following the suggestion of MacCallum et al. (1992).

In spite of this, we preferred a conservative approach. Participants were randomly ordered and the EFA and CFA were performed with the first and second halves of the sample, respectively (n = 751 and 750). The ESEM analyses were carried out with the overall sample. In this way we felt we achieved a compromise between the need to cross-validate the results and the need to keep a sample size as large as possible for the final model.

Goodness-of-fit in all derived models was assessed with the common fit index (Hu & Bentler, 1999). Thus, we consider the model

satisfactory if the comparative fit index (CFI) and Tucker-Lewis index (TLI) have values greater than .95, the root mean square error of approximation (RMSEA) is less than .06, and the standardized root mean square residual (SRMR) is less than .08.

After defining the internal structure of the scale, we evaluated the reliability of scores for each factor (factor scores computed as the sum of the scores to each item). As Raykov and Marcoulides (2011, pp. 155–156) indicate, the most used indicator of reliability, Cronbach's alpha, will lead to problematic estimations whenever factor loadings of the items belonging to the same scale are not homogenous or whenever there are correlated uniquenesses. Due mainly to the negative wording of some items, both problems are present within SATAQ-3 (see 'Results' section). In these conditions, a different analytical approach should be applied based on the factor loadings and the correlations between items uniqueness (e.g., Brown, 2006; Raykov, 2009).

We also carried out a factor invariance study, since an internal structure in line with what would be expected does not necessarily mean that this structure will be maintained for the different subgroups of interest in the sample, namely sex and grade. For testing the invariance, what is evaluated is the equality (or minimal difference) between the regression lines that relate the factor score (predictive variable) and the score on the item (criterion variable). In this context, the regression line is specified by the slope (factor loadings) and the criterion value when the predictor equals 0 (intercept). A series of progressive restrictions are imposed in sequentially tested models (e.g., Vandenberg & Lance, 2000). First of all, it is verified that the model fits for each group separately. Secondly, we tested equality of form. In the context of CFA, this involves fixing for the different groups the number of factors and the factors in which each item will saturate. In ESEM, given that the items load in all the factors, only the number of factors is considered. Thirdly, we tested the equality of factor loadings. For doing so, the factor loadings are fixed as equal across the different groups. We considered those restrictions as satisfactorily met if the decrease in CFI was lower than .01 (Cheung & Rensvold, 2002) and RMSEA and TLI remained constant or increased (Marsh et al., 2009, 2010). Fourthly, we analyzed the intercept invariance. The decision rule for maintaining or rejecting it is the same as in the previous step.

Measurement invariance does not necessarily mean invariance in the relationship between factors. It is possible that the interpretations of the scores of two factors are equivalent for different groups, but that those two factors correlate in a different way in those groups. Hence the distinction between measurement invariance and structure invariance. Structure invariance is tested by fixing as equal the variances and covariances between factors for the different groups.

All the analyses were performed with M*plus* 6.11 (Muthén & Muthén, 1998–2010). None of the default specifications of M*plus* were modified. For the construction of M*plus* scripts for the different analyses the examples from Dimitrov (2010) and Marsh et al. (2009) were used as guides.

Results

Skewness and kurtosis of item scores were assessed in order to determine the estimator to apply in the factor analysis. The absolute value of skewness of all the items was lower than 2 (mean = .68; minimum = .06; maximum = 1.98), while the absolute value of kurtosis was always lower than 7 (mean = 1.00; minimum = .04; maximum = 2.89). These modest deviations from normality allowed us to employ maximum-likelihood (ML) estimation in the factor models (Russell, 2002; West, Finch, & Curran, 1995).

Participants whose percentage of missing data was over 10% in any of the questionnaires from the battery were excluded from the analysis, so that the effective sample size was of 1501 participants (96.28% of the original sample). Currently, when ML can be applied, the full information maximum likelihood (FIML) algorithm is considered to be among the most acceptable methods for accommodating missing data (Enders & Bandalos, 2001). We used FIML to deal with missing data.

To confirm that the results did not depend on the estimator used or the method used with the missing data, all the analyses were replicated with robust maximum-likelihood and multiple imputation, and an identical pattern of results found.

Internal Structure of the SATAQ-3 and Reliability

In a first EFA, with the first half of the sample, we fixed at four the number of factors to extract, following the theoretical model used in the construction of the questionnaire. The model fit was poor (see M1 in Table 1). We checked a solution with five factors (see M2 in Table 1), which brought the fit up to satisfactory levels. Factor loadings are shown in Table 2. There are two main aspects to discuss regarding the results from M2: (a) the emergence of a method factor (a statistical artifact reflecting the excess of covariance between items sharing a characteristic in their wording) that groups the reverse-keyed items; and (b) the presence of some cross-loadings. Item 20 presents important cross-loadings: Although originally designed to assess the *Internalization-Athlete* dimension, it presents significant loadings in the four substantive factors. Considering the loadings from the statistical significance perspective, five items had significant loadings in more than one substantive factor. The *Internalization-General* and *Pressures* factors are those with the greatest presence of significant cross-loadings, with three items. Not considering Item 20 and the method factor, the mean value of loadings that are significant in a factor other than the principal factor is .22, with a maximum of .26 for Items 4 and 16 in *Pressures*.

The results clearly indicate that EFA is not the appropriate technique for analyzing this data. The emergence of a method factor, irrelevant from a theoretical point of view, indicates that part of the covariance between reverse items cannot be described by means of the theoretical latent factors alone. In view of these results we decided to remove Item 20. It is questionable for an item to remain in a test when that item presents similar loadings in the factor to which it was theoretically linked at the time of its construction and also in other factors. Furthermore, from the applied perspective, this way of working would involve problems when it comes to scoring the test. The majority of test uses are based not on latent scores but on the sum of observed scores. In such cases, the treatment of an item that belongs simultaneously and markedly to several factors would be problematic.

The previous analyses clearly indicate the need to correlate the uniqueness between reverse items and the appropriateness of removing Item 20 from the instrument. Given the cross-loadings found, we expected that the CFA model would not fit. In spite of this, we tested a CFA to gain comparability with previous studies where this technique has been applied with SATAQ-3 (Jackson & Chen, study 2, 2010; Karazsia & Crowther, 2008; Markland & Oliver, 2008). The fit of this model (M3), with the second half of the sample, did not reach the established thresholds.

Next, we applied ESEM with the overall sample, with correlated uniqueness and discarding Item 20. The model fit indices support the modeling of the SATAQ-3 internal structure using this technique (M4). Even though the TLI is slightly below the proposed cut-off value (.94 versus .95), the values obtained in the remaining indices lead us to consider the model's fit as satisfactory.

Table 1
Goodness of fit indices for the different models.

Models		χ^2 [a]	*df*	RMSEA	SRMR	TLI	CFI	ΔRMSEA	ΔTLI	ΔCFI
EFA										
M1	1st half of the sample	1535.959	321	.071	.037	.858	.895			
M2	1st half of the sample – 5F	897.777	295	.052	.023	.924	.948			
CFA										
M3	2nd half of the sample – CU – NO20	1043.097	316	.055	.048	.917	.931			
ESEM										
M4	Overall sample – CU – NO20	1141.524	268	.047	.020	.940	.960			
By sex – CU – NO20										
M5	Girls	742.255	268	.049	.022	.935	.957			
M6	Boys	750.671	268	.048	.026	.924	.950			
M7	Equal form	1492.926	536	.049	.024	.930	.954			
M8	Equal form and equal factor loadings	1731.088	636	.048	.032	.932	.947	−.001	.002	−.007
M9	Equal form, equal factor loadings and equal intercepts	1794.560	661	.048	.034	.933	.945	0	.001	−.002
M10	Equal form, equal factor loadings, equal intercepts and equal covariances	2102.461	671	.053	.088	.916	.931	.005	−.017	−.014
By grade – CU – NO20										
M11	Seventh	502.033	268	.048	.029	.925	.951			
M12	Eighth	598.201	268	.057	.031	.906	.938			
M13	Ninth	556.471	268	.053	.026	.928	.952			
M14	Tenth	594.624	268	.058	.027	.920	.947			
M15	Equal form	2251.330	1072	.054	.028	.920	.947			
M16	Equal form and equal factor loadings	2704.686	1372	.051	.042	.929	.940	−.003	.009	−.007
M17	Equal form, equal factor loadings and equal intercepts	2814.370	1447	.050	.043	.931	.939	−.001	.001	−.001
M18	Equal form, equal factor loadings, equal intercepts and equal covariances	2932.191	1477	.051	.061	.928	.935	.001	−.003	−.004

Notes: EFA = exploratory factor analysis; CFA = confirmatory factor analysis; ESEM = exploratory structural equation modeling; 5F = model with 5 factors extracted (all the other models were with 4 factors); CU = correlated uniqueness; NO20 = deletion of Item 20; χ^2 = chi-square test; *df* = degrees of freedom; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; TLI = Tucker–Lewis index; CFI = comparative fit index; Δ = increment in fit index with respect to previous model.

[a] χ^2 values of EFA, CFA, and ESEM cannot be directly compared, as the analysis are based on different samples sizes.

The factor loadings for the M4 are shown in Table 2. All the items loaded significantly and principally in the factor with which they were associated. The average loading of the direct items in their principal factors was clearly greater than that of the reverse items (.72 versus .37). Of the 87 secondary loadings (29 items × 3 secondary factors), 15 were statistically significant, with an average, taking their absolute values, of .15 (maximum = .30; minimum = .07). The different number of secondary loadings with statistical significance in EFA and ESEM can be explained mainly by the different sample size, and hence, the different statistical power. As we found with EFA, the highest number of cross-loadings is found between the factors *Pressures* and *Internalization-General*, in this case with five items. These results show that the CFA requirement of fixing the secondary loadings to 0 is excessively restrictive for the case of the SATAQ-3.

The reliability estimates were .840, .830, .859 and .775 for the scales *Internalization-General*, *Information*, *Pressures* and *Internalization-Athlete*, respectively. All these values can be considered as satisfactory.

Inter-factor correlations for this model can be seen in Table 3. As in the original study (Thompson et al., 2004), the highest correlation (.64) was between *Pressures* and *Internalization-General* factors, indicating a moderate degree of overlap.

Having determined that the model which best permits the description of covariances between items in the SATAQ-3 is ESEM, we proceeded to analyze the measurement invariance by both sex and grade.

Measurement Invariance

As previously described, the usual approach involves following a series of steps. First, we checked the model for each group separately. In our case, and as can be seen in Table 1, the fit was satisfactory for both males and females (M5 and M6), and for the sample divided into the different grades (M11–M14). The lower degree of fit for the sample from grade 8 should be noted, but even so we consider that this step can be deemed satisfactorily completed. Secondly, we tested equality of form. The fit was satisfactory for this step, both in the case of the sample segmented by sex (M7) and in that segmented by grade (M15). Thirdly, we tested the equality of factor loadings. Given the minimal change in model fit, we can maintain the invariance of factor loadings both by sex (M8) and by grade (M16). Fourthly, we analyzed the intercept invariance. We added to the invariance in factor loadings the invariance in the intercepts (M9 and M17) and found no relevant change in the fit indices.

After this, we analyzed whether the inter-factor variance–covariance matrix was equal across groups. As can be seen in Table 1, we cannot sustain structure invariance for the SATAQ-3 by sex, given that the TLI and CFI fall by more than .01 (M10). However, this kind of invariance holds for the different grades (M18). Thus, the correlations between factors for the overall sample presented in Table 3 will have to be qualified taking sex into account.

Comparison by Sex and Grade

Invariance of loadings and intercepts permits identical interpretation for the same factor score in individuals from different groups, so that it is possible to compare means between groups. These results are those shown in Table 4.

The metric of the factor scores is determined by fixing the mean and standard deviation of the reference group (females or seventh grade in these cases) to 0 and 1. The differences in means can be approximately interpreted as effect sizes according to Cohen's (1988) criteria. The pattern of results with regard to sex shows what would be expected theoretically. For all the SATAQ-3 dimensions except *Internalization-Athlete* males present lower mean values than females. On analyzing the differences in scores by grade, we see that both *Internalization-General* and *Information* increase with increasing grade. For the *Pressures* factor the pattern is somewhat more confused, since the mean for grade 3 lies between grades 2 and 4, but at the end of compulsory secondary education the mean is higher than at the beginning of it. Only the *Internalization-Athlete* dimension seems not to vary across the different grades.

Table 2
Factor loadings for EFA (M2) and ESEM (M4).

		EFA Factor loadings					ESEM Factor loadings			
		I-GEN	INFO	PRES	I-ATL	NEG	I-GEN	INFO	PRES	I-ATL
01	TV programs are an important source of information about fashion and "being attractive."	.004	**.671**	−.047	.041	.083	.004	**.696**	−.036	.021
02	I've felt pressure from TV or magazines to lose weight	.028	−.024	**.791**	−.101	−.049	.006	−.019	**.758**	**−.092**
03*	I wouldn't like my body to look like the people who are on TV	**.275**	−.077	.131	−.005	**.499**	**.402**	−.030	.124	−.036
04	I compare my body to the bodies of TV and movie stars	**.604**	.014	**.257**	−.067	−.013	**.582**	.030	**.210**	−.050
05	TV commercials are an important source of information about fashion and "being attractive."	−.014	**.752**	.006	.026	.024	−.032	**.774**	−.033	.009
06*	I haven't felt pressure from TV or magazines to look pretty	−.054	.028	**.310**	.048	**.520**	.069	.003	**.353**	−.012
07	I would like my body to look like the models who appear in magazines	**.805**	−.031	−.107	.051	.032	**.819**	−.019	**−.123**	.071
08	I compare my appearance to the appearance of TV and movie stars	**.657**	.010	.178	.012	−.005	**.656**	.019	**.164**	−.008
09*	Music videos on TV aren't an important source of information about fashion and "being attractive"	−.118	**.269**	−.012	.002	**.492**	.010	**.286**	.022	−.035
10	I've felt pressure from TV and magazines to be thin	.086	−.021	**.730**	−.055	−.004	.036	−.025	**.773**	−.033
11	I would like my body to look like the people who are in the movies	**.738**	.021	.028	.053	.010	**.767**	−.004	.024	**.087**
12*	I don't compare my body to the bodies of people who appear in magazines	**.222**	.023	.098	−.022	**.554**	**.330**	.003	**.175**	−.069
13*	Magazine articles aren't an important source of information about fashion and "being attractive"	−.011	**.431**	−.024	−.053	**.423**	.051	**.457**	.002	−.068
14	I've felt pressure from TV or magazines to have a perfect body	**.177**	.013	**.661**	.030	.038	**.152**	.020	**.670**	.049
15	I wish I looked like the models in music videos	**.718**	.074	−.039	.049	.000	**.730**	.055	−.009	**.072**
16	I compare my appearance to the appearance of people in magazines	**.617**	.051	**.260**	−.034	.066	**.584**	.045	**.303**	−.034
17	Magazine advertisements are an important source of information about fashion and "being attractive"	−.003	**.832**	.037	.002	−.014	−.049	**.828**	.021	.019
18	I've felt pressure from TV or magazines to diet	−.055	−.025	**.756**	.079	.030	−.063	.003	**.786**	.050
19*	I don't wish I looked as athletic as the people in magazines	.113	−.071	−.078	**.353**	**.443**	**.219**	−.034	−.024	**.341**
20	I compare my body to that of people in "good shape"	**.286**	**.136**	**.213**	**.290**	−.071	NA	NA	NA	NA
21	Pictures in magazines are an important source of information about fashion and "being attractive"	.072	**.763**	.055	−.005	−.027	.046	.777	.021	−.014
22	I've felt pressure from TV or magazines to exercise	−.002	.075	**.603**	**.197**	.032	−.005	.032	**.621**	**.216**
23	I wish I looked as athletic as sports stars	**.005**	.001	−.082	**.781**	−.015	.028	.008	−.085	**.809**
24	I compare my body to that of people who are athletic	.084	.060	**.143**	**.623**	−.025	.113	.031	**.154**	**.595**
25	Movies are an important source of information about fashion and "being attractive"	.059	**.722**	.053	.035	−.016	−.002	**.727**	.081	.040
26	I've felt pressure from TV or magazines to change my appearance	.051	.078	**.655**	.041	.032	.063	.048	**.691**	**.082**
27*	I don't try to look like the people on TV	**.219**	.040	.065	.017	**.524**	**.346**	.022	.136	.008
28*	Movies aren't an important source of information about fashion and "being attractive"	.000	**.468**	−.062	−.050	**.410**	.103	**.453**	−.025	−.042
29	Famous people are an important source of information about fashion and "being attractive"	.141	**.618**	.050	−.004	−.002	**.123**	**.640**	.026	−.006
30	I try to look like sports athletes	−.080	−.037	.040	**.836**	.028	−.066	−.019	.055	**.806**

Notes: I-GEN: *Internalization-General*; INFO: *Information*; PRES: *Pressures*; I-ATL: *Internalization-Athlete*. Items with asterisk correspond to reverse-keyed items. Shaded cells indicate the factor where the item theoretically belongs. Bold loadings indicate statistically significant loadings, applying correction for multiple comparisons.

Table 3
Inter-factor correlations for the overall sample (M4) and by sex (M10).

	I-GEN	INFO	PRES	I-ATL
Overall				
I-GEN				
INFO	.547			
PRES	.637	.485		
I-ATL	.304	.159	.190	
Girls				
I-GEN				
INFO	.643			
PRES	.592	.525		
I-ATL	.248	.252	.136	
Boys				
I-GEN				
INFO	.532			
PRES	.439	.384		
I-ATL	.692	.447	.338	

Notes: I-GEN: *Internalization-General*; INFO: *Information*; PRES: *Pressures*; I-ATL: *Internalization-Athlete*.

Table 4
Factor means (and standard deviations) by sex (M9) and by grade (M18).

	By sex[a]		By grade[b]			
	Girls	Boys	Grade 7	Grade 8	Grade 9	Grade 10
INTER-G	0 (1)	−0.552 (0.617)	0 (1)	0.284 (1)	0.343 (1)	0.437 (1)
INFO	0 (1)	−0.623 (0.320)	0 (1)	0.291 (1)	0.334 (1)	0.563 (1)
PRESS	0 (1)	−0.445 (0.965)	0 (1)	0.283 (1)	0.154 (1)	0.277 (1)
INTER-A	0 (1)	0.766 (1.184)	0 (1)	0.066 (1)	−0.058 (1)	0.051 (1)

Notes: I-GEN: *Internalization-General*; INFO: *Information*; PRES: *Pressures*; I-ATL: *Internalization-Athlete*.
The metric of the model is determined by fixing the mean and standard deviation of the reference group (girls or grade 7) to 0 and 1.
[a] Descriptives for M9.
[b] Descriptives for M18.

Table 3 shows the matrix of correlations between factors by sex. These results qualify the correlations between factors presented previously. It is observed how, for the boys, *Internalization-Athlete* is much more of a core component within the SATAQ-3 scale than it is for the girls, since for males this scale is much more closely correlated with the others. Thus, for example, the correlation between *Internalization-General* and *Internalization-Athlete* is .25 for females and .69 for males.

Discussion

The present study had two basic objectives. The first was to study the factor structure of the Spanish version of the SATAQ-3 with adolescent boys and girls maintaining the original text of the items for both sexes, with the reverse-keyed items suggested by the authors of the original version. Our data replicate the original four-factor structure and support the appropriateness of our SATAQ-3 version (see Appendix in supplementary content, available online) for use with Spanish adolescent population. This is the first version of this questionnaire that shows satisfactory fit for adolescents by means of an ESEM model. To date, only the French versions (Rousseau et al., 2010; Rousseau & Valls, 2010) had been applied to adolescent population, but using principal components analysis and without reverse-keyed items.

Our results show an anomalous functioning of the negative items. Thus, in the EFA models the negative items present relevant cross-loadings between the substantive factor to which each item corresponds and a fifth, method factor, the loading in the method factor being greater than in the substantive factor. Moreover, in the ESEM model, the factor loadings of the reverse-keyed items are always lower than those of the direct items. Therefore, the correlation between negative items could be better explained by an irrelevant aspect (wording) than by their theoretical content. Problems with the use of negative items have already been mentioned in other studies (e.g., Barnette, 2000; Schriesheim, Eisenbach, & Hill, 1991). We therefore recommend the use of a version without reverse-keyed items.

The factors *Internalization-General* and *Pressures* are those with the most cross-loadings in the different models, in line with the findings of other studies in which the two factors have been grouped in a single factor (Jackson & Chen, 2010; Swami, 2009). These results suggest the difficulty of developing items assessing purely a single dimension, probably due to the close conceptual link between the two factors. Subsequent studies should address the conceptual links and/or differences between these two factors.

The factor *Internalization-Athlete* presents the lowest correlations with the rest of the factors in the different models used, as already observed in the original study (Thompson et al., 2004) and in the CFA carried out by Markland and Oliver (2008), even though this result is modulated by the sex variable.

Item 20, designed to assess the *Internalization-Athlete* dimension, is the only item that presents significant cross-loadings in all the substantive dimensions in the EFA. This item already showed similar problems in previous work (Calogero et al., 2004; Markland & Oliver, 2008; Rousseau et al., 2010), leading other validation studies to remove it from the outset (e.g., Jackson & Chen, 2010). The explanation may lie in the semantic differences between this item and the rest of the *Internalization-Athlete* factor items (Markland & Oliver, 2008). Whereas the other *Internalization-Athlete* items refer to sporty or athletic individuals as a source of comparison, Item 20 refers to comparisons with others who are “in good shape”. For all of these reasons, we recommend the removal of Item 20 from the SATAQ-3.

The data show how the limitations of EFA (incapacity to establish correlations between uniqueness; impossibility of assessing invariance) and CFA (excessively restrictive model on defining all the secondary loadings as equal to 0) are overcome by ESEM on analyzing the internal structure of the SATAQ-3. With EFA we obtained a factor solution that was difficult to interpret, due to the appearance of a method factor that grouped the negative items. With CFA model fit indices did not meet the specified thresholds. ESEM reduces the restrictions to impose and provides the best fit of all the models analyzed.

The second objective of the present work was to study the invariance of the instrument. The results support the invariance both by sex and by grade, providing substantial endorsement for the possibility of using the same version of the questionnaire (without Item 20) with both boys and girls and throughout a large portion of adolescence, without adaptations or changes from previous versions, as has been the case in other studies (e.g., Karazsia & Crowther, 2008). Once the invariance of scores by sex and grade had been guaranteed, we proceeded to compare the different scores of the groups.

As regards sex, the pattern of results reflects the theoretical expectations, so that for all the SATAQ-3 dimensions except *Internalization-Athlete*, the boys present lower mean values than the girls. These results are in accordance with those of previous studies. In this regard, the only meta-analysis published to date for determining the extent to which pressure from the mass media to conform to the muscular “ideal” male body affects men’s self-images (Barlett, Vowels, & Saucier, 2008) found effect sizes smaller than those found by other meta-analyses in relation to the effects of media exposure and media influence on body image and disordered eating in females (Grabe et al., 2008; Groesz, Levine, & Murnen, 2002). In the case of *Internalization-Athlete* it is boys who score higher. This finding, together with the pattern of higher correlations of this factor with the remaining factors in the case of boys, may indicate that this subscale would be much more of a core component within the SATAQ-3 in boys than it is for girls. Although the items making up this subscale were added in view of the recent focus on athleticism and sports in young women (Cusumano & Thompson, 1997), the data indicate that in the case of males the subscale might also assess the internalization of the muscular ideal, which is encouraged more among boys (Blond, 2008; Calogero & Thompson, 2010; Warren, 2008).

As far as grade is concerned, except in the case of *Internalization-Athlete*, the scores in the factors increase with age, and especially so for the *Information* and *Internalization-General* factors. Prospective studies suggest that eating pathology is most likely to emerge between the ages of 15 and 19 in adolescent girls (Lewinsohn, Striegel-Moore, & Seeley, 2000; Stice, Killen, Hayward, & Taylor, 1998). In the field of eating disorders prevention, selected prevention programmes produced significantly larger decreases in thin-ideal internalization than universal programmes, and significantly larger effects were observed for trials focusing on participants over age 15 than for trials focusing on younger participants (Stice et al., 2007; Stice & Shaw, 2004). Interventions may be more effective for the former because they were delivered during the period of greatest risk for emergence of eating disturbances, because younger adolescents may have limited insight, or because of a floor effect caused by the low levels of eating pathology during early adolescence (Stice et al., 2007; Stice & Shaw, 2004). In line with these findings is the observation of the general increase with age that occurs in scores for *Internalization-General* and *Information*.

These results, with regard to both sex and grade, which are in accordance with what was expected, lend support to the validity of our version of the SATAQ-3. Likewise, the invariance found suggests that the construction of different versions of a questionnaire for its applications to different populations should be confined to those cases in which there is evidence of such a need. The fact of having administered different tests to boys and girls could have led to their results being impossible to compare.

This study has several limitations, while also pointing the way to future lines of research. On the one hand, we did not find satisfactory explanations for the relative stability of scores on the *Internalization-Athlete* scale across the different grades. This result should be checked in future studies, exploring the way scores on the different SATAQ-3 subscales develop with increasing age. On the other hand, our findings clearly suggest the pertinence of using a version without reverse-keyed items, but we cannot guarantee that the results obtained with the tested version (fit of the model and invariance) are generalizable for a version with all direct items. Therefore, it would be necessary to replicate the study using a version without reverse-keyed items.

We should point out several limitations of ESEM. First, in terms of usability, to date ESEM is implemented exclusively in M*plus*. Second, in terms of historical background, while research on EFA and CFA (and with EFA and CFA as statistical tools) dates back over decades, ESEM is a much newer approach, and this has certain consequences. For instance, we have used as cut-points for evaluating model fit and measurement invariance those developed in the CFA context, as no specific guidelines have been proposed for ESEM. Third, ESEM also has its own statistical limitations, some of which could be relevant for the analysis of SATAQ-3. In the CFA context the excess of covariance between negative items can be modeled with correlated uniqueness or with a method factor. In ESEM this second option is not available. In EFA and CFA, a common recommendation when correlated factors are obtained is to perform a second-order factor analysis, but with ESEM this is not possible.

To summarize, the results of the present study suggest that the SATAQ-3 can be used with Spanish adolescent populations. The invariance demonstrated, estimated for the first time with the SATAQ-3, will also permit the instrument as originally constructed to be administered to both sexes and throughout a large portion of the adolescent period.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.bodyim.2011.10.002.

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2.2 VALORACIÓN DEL EFECTO DEL ESTATUS DE PESO CORPORAL PERCIBIDO SOBRE LAS CONDUCTAS DE CONTROL DEL PESO EN ADOLESCENTES VARONES

2.2.1 Artículo: *Self-perceived weight status, dieting, and unhealthy weight-control behaviors among Spanish male adolescents*

Como se ha observado en estudios previos, una percepción inadecuada del propio peso puede promover las conductas de control del peso, siendo el efecto diferente cuando se considera el sexo (mayor en mujeres), y el estatus de peso corporal (mayor en obesos) (Lemon et al., 2009). Desconocemos de la existencia de estudios que hayan evaluado estas cuestiones en población española. Por este motivo, el segundo artículo tuvo como objetivo general examinar el rol del estatus de peso percibido en las conductas de control del peso.

Específicamente, el objetivo fue explorar el efecto del estatus de peso corporal percibido sobre la práctica de dieta y conductas no saludables de control del peso en adolescentes varones, considerando su estatus de peso corporal.

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Self-perceived weight status, dieting, and unhealthy weight-control behaviors among Spanish male adolescents

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Abstract

Introduction: **Self-perceived weight status among adolescents has been associated with weight-control behaviors. However, this relationship varies across weight status.**

Objectives: **The aim of this study was to examine the effect of self-perceived weight status on dieting and unhealthy weight-control behaviors among Spanish male adolescents, across weight status.**

Method: **Participants were 597 Spanish male adolescents (M = 13.94 years old, SD = 0.60). Body weight and height were measured in situ. Self-perceived weight status, dieting, and unhealthy weight-control behaviors were evaluated.**

Results: **The adolescents were inaccurate on estimating their weight status. Those who were overweight or obese, or who perceived themselves to be so, were more likely to report dieting and unhealthy weight-control behaviors.**

Discussion: **There is a need to promote healthier eating behaviors among adolescents, and to take into account the fact that self-perceived weight status may hinder the adoption of such behaviors.**

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Key words: *Body image. Body weight. Adolescent. Sex factors. Weight loss. Self-perceived weight status.*

ESTATUS DE PESO PERCIBIDO, DIETA Y CONDUCTAS NO SALUDABLES DE CONTROL DEL PESO EN ADOLESCENTES VARONES ESPAÑOLES

Resumen

Introducción: **El estatus de peso percibido se ha asociado a conductas de control del peso en adolescentes. Esta relación varía de acuerdo al estatus de peso corporal.**

Objetivos: **Explorar el efecto del estatus de peso percibido sobre la práctica de dieta y conductas no saludables de control del peso en adolescentes varones españoles, considerando su estatus de peso.**

Método: **Participaron 597 adolescentes (M = 13,94 años, DS = 0,60). Se registró in situ la talla y peso corporal. Se evaluó el peso percibido, la práctica de dieta y conductas no saludables de control del peso.**

Resultados: **Los adolescentes fueron inexactos al estimar su estatus de peso. Aquellos con sobrepeso, obesidad o los que se percibían como tales, fueron los que más informaron hacer dieta y conductas no saludables de control del peso.**

Discusión: **Es necesario promover conductas alimentarias saludables entre los adolescentes y considerar que el estatus de peso percibido puede limitar la adopción de estos comportamientos.**

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Palabras clave: *Imagen corporal. Peso corporal. Adolescente. Factores de sexo. Pérdida de peso. Peso percibido.*

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Abbreviations

UWCB: Unhealthy weight-control behaviors.
SD: Standard deviation.
MABIC: Medios de comunicación, alimentación alterada, burlas relacionadas con el peso e insatisfacción corporal.
CSPT: Corporació Sanitària Parc Taulí.
BMI: Body Mass Index.
EAT: Eating Among Teens.

Introduction

Dieting and unhealthy weight-control behaviors (UWCB), such as fasting, eating very little and skipping meals are common behaviors among adolescents trying to lose weight.[1] Unfortunately, these behaviors tend to take place in a naturalistic way (ie without professional advice), increasing the risk of unhealthy eating patterns and weight gain over time.[1] Several external factors may contribute to promoting these UWCB among adolescents. For instance, the multi-billion dollar weight-loss industry, public health campaigns for tackling the so-called "obesity epidemic" or pressure from peers and parents may, directly or indirectly, encourage adolescents to adopt UWCB so as to lose weight. Even so, other, more individual factors can also facilitate the adoption of UWCB.

A significant individual factor is self-perceived body weight (ie how we perceive our own body weight). However, few studies have taken into account that this self-perception may vary by weight status, and may influence the adoption of eating and weight-related behaviors in different ways. In particular, an inaccurate self-perception of body weight can promote the adoption of unhealthy eating patterns and behaviors among the overweight and obese,[2] and increase the risk of weight preoccupations and weight control among normal-weight adolescents.[3]

In addition, recent studies have revealed secular trends over time in relation to self-perceived body weight among Spanish adolescents.[4] Specifically, such research found a pattern of change toward the underestimation of overweight status, suggesting that the steady increase of the overweight population may make weight misperception more likely, especially among overweight men. Thus, it is important in this context to examine the role of self-perceived body weight in relation to the adoption of dieting and UWCB.

Accordingly, the aim of the present study was to examine the role of self-perceived weight status in dieting and UWCB among Spanish male adolescents of different weight status.

Method

Sample and procedure

The sample comprised 597 boys (13 to 16 years old; M = 13.94, SD = 0.60), predominantly middle-class (79.5%).[6] Self-reported origin was typically Spanish (73.8%), followed by Latin-American (12.2%), mixed parentage (5.4%), North African (3.2%), European (2.5%), Sub-Saharan (1.2%), and other (1.7%). Participants were part of the MABIC project, a longitudinal research project on the prevention of eating- and weight-related problems among adolescents of both sexes from Barcelona (Spain).[5] The study followed the ethical guidelines of the Helsinki Declaration (as revised in Edinburgh, 2000). The protocol was approved by the Clinical Research Ethics Committee of the "Parc Taulí" Health Corporation (CSPT). A detailed description of the methodology has been reported previously.[5]

Materials

Measured weight status. Height and weight were measured *in situ.* Body mass index (BMI = kg/m^2), was calculated and used to obtain weight-status categories (underweight, normal weight, overweight, obese), using international cut-off points for age and sex.[7,8]

Self-perceived weight status. Participants were asked "What do you think is your current weight level?" Response options were: underweight, normal weight, slightly overweight, very overweight.

Dieting. Based on Project EAT,[9] participants were asked "How often have you gone on a diet during the last year?" Next to the question the term diet was defined as "changing the way you eat so you can lose weight". Response options were: "never", "one to four times", "five to 10 times", "more than 10 times", and "I am always dieting". Following previously-reported criteria,[10] respondents who reported having dieted at least once were classified as dieters.

Unhealthy weight-control behaviors (UWCB). Also based on Project EAT, participants were asked "Have you done any of the following things in order to lose weight or keep from gaining weight in the past year?" Response options were: "skipped meals", "fasted", "ate very little food", "smoked more cigarettes" "used a food substitute", "made myself vomit", "took diet pills", "used laxatives", and "used diuretics". Response format was dichotomous ('yes', one point; 'no', zero points). As in previous studies,[10] respondents reporting at least one behavior were classified as engaging in UWCB.

Data Analyses

First, descriptive analyses were performed to examine the sample in terms of weight status (measured, self-perceived), and behaviors (dieting, UWCB). Second, logistic regression analysis was used to obtain the odds of dieting and then of UWCB. Each logistic regression was controlled for age, ethnicity, and socioeconomic status. Predictors were measured weight status and self-perceived weight status.

Table I
*Self-perceived weight status by measured weight status**

	Measured weight status				
	UW†	*NW*‡	*OW*§	*OB*‖	Total
N	49	384	116	44	
Self-perceived weight status					
Underweight	**55.1**	9.9	0	0	10.9
Normal weight	42.9	***85.1***	40.5	9.1	66.9
Slightly overweight	0	5.0	**58.6**	77.3	20.6
Very overweight	2.0	0	0.9	**13.6**	1.5
Total	8.3	64.8	19.6	7.4	100

*Data is given as percentage. Total n values may differ because of incidental missingness.
†UW = underweight.
‡NW = normal weight.
§OW = overweight.
‖OB = obese.

Results

Mean BMI was 20.94 (*SD* = 4.18); 44 boys were obese (7.4%), 116 overweight (19.6%), 384 normal weight (64.8%) and 49 underweight (8.3%).

Self-perceived weight status

Comparing measured weight status with self-perceived weight status (table I), only 13.6% of obese adolescents self-perceived as very overweight, 40.5% of overweight adolescents self-perceived as normal weight, and 42.9% of underweight adolescents self-perceived as normal weight. These results indicate that a substantial number of adolescents were inaccurate on estimating their weight status.

Dieting and unhealthy weight-control behaviors

In descriptive terms, a total of 25.6% of adolescents were classified as dieters (8.2% of underweight, 12.5% of normal weight, 55.2% of overweight, and 77.3% of obese). Regarding UWCB, 25% of adolescents reported at least one UWCB (20.4% of underweight, 17.4% of normal weight, 38.8% of overweight, and 56.8% of obese). These results indicate that a high percentage of overweight and obese adolescents reported being engaged in dieting and UWCB. Notably, some already underweight boys also reported dieting and UWCB.

Dieting and unhealthy weight-control behaviors by measured weight status and by self-perceived weight status

The underweight group (n = 49), was removed from subsequent analyses because of the small number of cases reporting dieting and UWCB in each category.

Next, and before carrying out the logistic regression analyses, measured weight status and self-perceived weight status were reduced to two categories each. Thus, measured weight-status categories were reduced to (1) normal weight and (2) overweight, including obese; self-perceived weight-status categories were reduced to (1) self-perceived normal weight and (2) self-perceived slightly overweight or very overweight.

Table II shows the odds of dieting and UWCB from the logistic regression analyses.

The odds of dieting and UWCB were statistically significant on comparing those who were either overweight or obese (or self-perceived as such), with those who were normal weight (or self-perceived as such). These results indicate that, in general, either being or self-perceiving as overweight or obese increases the

Table II
*Odds Ratio (OR) indicating the effect of weight status on dieting and unhealthy weight-control behaviors (UWCB)**

Variables	*OR*	*Wald*	*95% CI*
Dieting			
MWS†	**10.74**	108.95	6.88-16.77
SPWS‡	**11.15**	103.61	7.01-17.73
MWS × SPWS§	**12.71**	105.55	7.83-20.65
UWCB			
MWS	**3.47**	34.38	2.29-5.27
SPWS	**2.74**	21.19	1.78-4.22
MWS × SPWS	**2.79**	20.31	1.79-4.37

*Analyses were adjusted by ethnicity, age, and socioeconomic status. Weight status categories (measured, self-perceived) were: normal weight and overweight including obese. Reference group was normal weight. Results in bold were significant ($p < 0.001$).
†MWS = measured weight status.
‡SPWS = self-perceived weight status.
§MWS × SPWS = interaction between these two variables.

risk of dieting and UWCB. It is noteworthy that the risk of dieting was slightly higher among those who self-perceived as overweight or obese. In contrast, the risk of UWCB was slightly higher among those who were actually overweight or obese.

Discussion

The aim of the present study was to examine the effect of self-perceived weight status on dieting and UWCB among Spanish male adolescents of different weight status.

We found that overweight and obese adolescents tended to underestimate their weight status, whereas underweight adolescents tended to overestimate it. This finding has been reported previously, [3] and merits further attention. For example, weight-related norms (eg what is perceived as a normal body weight in a given context) may influence how adolescents perceive and estimate their body size.[11] These social norms are commonly linked to an ideal of beauty or attractiveness in a given context. [12] In Western countries such as Spain, boys may be aware of a male beauty/attractiveness ideal (eg a lean and muscular body), and may perceive sociocultural pressure (eg messages from peers and the media) to attain this ideal.[13] Thus, overweight and obese adolescents might underestimate their weight because of the double burden of sociocultural pressure and the stigma of obesity.[14] This could have a strong influence on how they perceive and estimate their body size,[15] to the extent that they may reject referring to themselves as overweight or obese. Alternatively, it may be that these overweight and obese adolescents perceive their weight as "normal" given the steady increase in the proportion of overweight and obese adolescents in Spain.[4] However, these ideas remain speculative, and further research is recommended. Furthermore, given the frequency of weight underestimation among overweight and obese adolescents, future studies should use caution on considering obesity prevalence based on self-reported data. In addition, the finding whereby underweight boys overestimate their weight could be explained by their having perceived their body size as closer to the ideal, so that they estimate their weight as "normal". Notably, few studies have examined weight overestimation among underweight boys.[3] Most probably, boys in this group have a body image disturbance, an eating disorder, or a higher risk of developing an eating disorder.[3] Nevertheless, this cannot be supported by our findings. Therefore, future studies evaluating body image attitudes and behaviors among underweight boys who overestimate their weight are recommended. Finally, professionals in the public health field must bear in mind that weight misperceptions among adolescents, either underestimation or overestimation, can interfere with the implementation of strategies for promoting healthy eating- and weight-related behaviors.[2]

As regards the prevalence of dieting and UWCB by weight status, the highest prevalence was found among obese adolescents. However, it should be noted that some already underweight boys also reported these behaviors. This finding is consistent with those of previous studies,[1,10,16] and highlights once more the importance of examining eating- and weight-related behaviors separately by weight status, as well as the need to further evaluate the risk of disordered eating among those in the extreme categories.

We also examined the effect of measured weight status and self-perceived weight status on the risk of dieting and UWCB. Our results suggest that either being or perceiving oneself as overweight or obese substantially increases the risk of dieting and UWCB, compared to being or self-perceiving normal weight. Notably, the risk of dieting was slightly higher if boys self-perceived as overweight or obese. This finding is consistent with the previous literature, including a large cross-national study.[16] However, it is also noteworthy that the risk of UWCB in our sample was slightly higher if boys were actually overweight or obese. Thus, our results may again suggest that other factors, such as weight-related norms,[11] may influence the risk of dieting and UWCB. For instance, it may be commonly accepted among these boys to engage in dieting if they are or self-perceive as overweight or obese. However, this idea remains speculative, and future studies should assess the role of social norms in relation to dieting and UWCB on comparing measured and self-perceived weight-status categories. In any case, these adolescents may be engaging in dieting behaviors without professional advice, and this can increase their risk of unhealthy eating patterns.[1] Consequently, health professionals should be aware of these behaviors and how self-perceived weight might influence eating patterns and behaviors of adolescents. Finally, and with a view to avoiding unintended potentially harmful effects such as promoting weight stigmatization and weight concerns, health professionals should help adolescents to adopt healthy eating- and weight-related behaviors focusing more on their overall wellness than exclusively on weight loss.[17]

This study has some limitations, and its results should be interpreted with caution. First, this is a cross-sectional study, so that the inferences that can be made are limited; more longitudinal studies are necessary. Second, our sample is not representative of the entire population of Spanish male adolescents, and few participants were in the extreme weight-status categories (underweight, obese). For these reasons, any generalizations should be made with care. Finally, we used some self-report measures that could bias the results due to under-reporting or over-reporting of behaviors. However, our study has some important strengths and implications. Few studies have examined the effect of self-perceived weight status on dieting and UWCB by including an objective measure of body weight and height, and by controlling for recognized

confounding variables. Objective measures of weight and height generate more accurate data than self-reported measures. Additionally, we used international cut-off points to establish weight status, and these are recommended so as to allow comparability among surveys.[18] Furthermore, logistic regression analyses were done by controlling for ethnicity and socioeconomic status, variables widely acknowledged to influence self-perceived weight.[11] Finally, our results on weight misperception are of great importance for future research. Weight misperception may be associated with weight-related norms referring to a normative perceptual threshold for overweight in specific populations,[11] or to the trends in body weight misperception observed over the last decades,[4] and this is a clear hint for professionals in the obesity field to give greater attention to self-perceived weight status.

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2.3 ASOCIACIÓN ENTRE INFLUENCIAS SOCIOCULTURALES Y CONDUCTAS DE MODIFICACIÓN DEL CUERPO EN ADOLESCENTES VARONES

2.3.1 *Artículo: Sociocultural influences and body change strategies in Spanish adolescent boys of different weight status.*

Como se ha señalado anteriormente, las influencias socioculturales son un factor importante en el origen y desarrollo de conductas de modificación del cuerpo. Sin embargo, estas influencias socioculturales parecen ser experimentadas de manera diferente por los hombres en comparación a las mujeres (Karazsia & Crowther, 2008, 2009; Tylka, 2011), así como por individuos de diferente estatus de peso corporal tales como los obesos o los de bajo peso (e.g. Jones & Crawford, 2006).

Existen pocos estudios que hayan evaluado estas posibles diferencias en varones, tanto a nivel internacional como en España. Por estos motivos, el tercer artículo tuvo como objetivo examinar la asociación entre las influencias socioculturales y las conductas de modificación del cuerpo en adolescentes españoles varones de diferente estatus de peso corporal. A continuación se presenta este artículo.

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Sociocultural influences and body change strategies in Spanish adolescent boys of different weight status

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ABSTRACT

The aim of the present study was to examine the association between sociocultural influences to attain an ideal body and body change strategies (BCS) in Spanish adolescent boys of different weight status. A total of 594 Spanish boys ($M = 13.94$ years, $SD = 0.20$) participated. Measures included in the study were weight status according to body mass index (BMI), sociocultural influences (perceived pressures to attain an ideal body, general internalization of an ideal body, internalization of an athletic-ideal body), BCS to lose/control weight (dieting, healthy and unhealthy weight-control behaviors), and BCS to gain weight and muscles. Underweight boys engaged more frequently in weight-gain behaviors. Overweight boys reported higher levels of perceived sociocultural pressures and general internalization compared to normal-weight boys, and were more likely to be engaged in BCS to lose/control weight compared with the other weight-status groups. There were no differences between groups in terms of internalization of an athletic-ideal body and BCS to increase muscles. Future research and prevention programs should consider male-specific behaviors and weight-status differences.

1. Introduction

Some adolescent boys engage in behaviors aimed at changing their body weight and shape (Ricciardelli & McCabe, 2004). Behaviors such as eating very little food to lose weight or taking steroids for muscle-building are potentially harmful, given that at this age they can be detrimental to the boy's growth and psychological well-being (Johns, Tidswell, Mcpherson, & Swift, 2009).

According to the sociocultural theory (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999), culture promotes body appearance ideals and values through parents, peers, and particularly the media. Individuals aware of these messages would perceive them as sociocultural pressures leading to cognitive processes such as appearance comparison and internalization (i.e., cognitive incorporation of cultural standards of beauty or attractiveness). In turn, these mechanisms would promote body dissatisfaction and an increased risk of disordered eating (Thompson et al., 1999). Several studies support this theoretical framework and its link to the development of body image disturbances and eating- and weight-related problems (Smolak, 2009).

The limited literature using this framework with samples of boys suggests that weight status also plays an important role (Ricciardelli & McCabe, 2004). Whereas among girls, regardless of their weight status, body dissatisfaction is usually expressed as a desire for a thinner body, among boys it is usually those who are underweight or overweight that are the most dissatisfied (Calzo et al., 2012). Taking into account weight status, boys would express different levels of body dissatisfaction and engage in body change strategies (BCS) either to put on weight or to lose weight. However, it should be noted that boys seem to be interested in muscularity, without regard to their weight status (Ricciardelli & McCabe, 2004).

Few studies have examined the use of BCS in boys across weight status (McCabe & Ricciardelli, 2009). Furthermore, some studies on eating behavior have overlooked the gap between intention and behavior (Larsen, van Strien, Eisinga, Herman, & Engels, 2007), and most studies have been carried out with samples from English-speaking Western countries; few have been conducted in Spain (e.g. López-Guimerà et al., 2013).

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This study was performed to examine the association between BCS and sociocultural influences in Spanish adolescent boys of different weight status. Three hypotheses were tested. First, consequent with previous findings as outlined above, we stated that overweight boys will engage more in BCS to lose/control weight and underweight boys will engage more in BCS to increase weight (BCS–W). Second, we stated that no differences will be found among weight-status groups in BCS to increase muscles (BCS–M). Third, we stated that underweight and overweight adolescent boys will report more sociocultural pressures and will show higher levels of internalization.

2. Method

2.1. Participants

Participants were 594 adolescent boys (M = 13.94 years old, SD = 0.20) from the MABIC project (Sánchez-Carracedo et al., 2013). Self-reported origin of participants was mainly Spanish (73.6%), followed by Latin-American (12.2%), others (12.5%), and 1.7% who did not specify their origin. Socioeconomic status, according to parents' educational level and occupational status (Hollingshead, 1957), was predominantly middle-class (81.0%).

2.2. Procedure

Ethical standards were approved by the Clinical Research Ethics Committee of the "Parc Taulí" Health Corporation (CSPT). Parental consent was used as a criterion for participation. A detailed description of the procedure can be found elsewhere (Sánchez-Carracedo et al., 2013).

2.3. Materials

2.3.1. Weight status

Height and weight were measured in situ. Body mass index (BMI = kg/m^2) was calculated. Using international cut-off points (Cole, Bellizzi, Flegal, & Dietz, 2000; Cole, Flegal, Nicholls, & Jackson, 2007), weight-status categories were obtained: underweight (8.3%), normal weight (64.8%), and overweight including obese (26.9%).

2.3.2. Sociocultural influences

Sociocultural Attitudes Toward Appearance Questionnaire-3, SATAQ-3 (Thompson et al., 2004). This scale is Likert-type from "completely disagree" (1) to "completely agree" (5). In the current study we used the subscales: Pressures (SATAQ-P), Internalization-General (SATAQ-IG) and Athletic-ideal Internalization (SATAQ-IA) of the Spanish version (Sánchez-Carracedo et al., 2012). Reliability values, using Cronbach's alpha, were .889, .899, and .823, respectively.

2.3.3. Body change strategies to lose/control weight

2.3.3.1. Dieting to lose weight. Based on the Project EAT (Neumark-Sztainer, Story, Hannan, Perry, & Irving, 2002), participants were asked "How often have you gone on a diet during the last year?", and a definition of diet was provided: "changing the way you eat so you can lose weight". The five possible answers were dichotomized into "no" (never) and "yes" (other responses).

2.3.3.2. Weight-control behaviors (WCB). Also guided by the Project EAT, we asked participants "Have you done any of the following things in order to lose weight or keep from gaining weight in the past year?", so as to assess healthy (HWCB, six items), and unhealthy (UWCB, nine items) weight-control behaviors. Response format is dichotomous ('yes' or 'no'). Participants answering at least one "yes" in each category were classified as engaging in HWCB or UWCB.

2.3.4. Body change strategies to increase weight and muscle

We selected four items from the Body Change Inventory (Ricciardelli & McCabe, 2002). Format is Likert-type from "never" (1) to "always" (5). In the current study we used two items assessing attempts to increase muscle tone (BCS–M; "How often do you: change your eating to increase your muscle tone? exercise more to increase your muscle tone?"), and two items referring to attempts to gain weight (BCS–W; "How often do you: eat more to put on weight?, exercise more to put on weight?").

2.4. Data analyses

A series of binary logistic regression analyses were carried out to assess the impact of weight status on the likelihood that respondents would report that they engage in HWCB, UWCB, or dieting. A series of ANOVAs were then performed to examine the relationships between weight status and continuous variables (BCS–W, BCS–M, and SATAQ-3 subscales). Socioeconomic status was entered as a covariant in all of the analyses. A significant ANOVA was followed up by Bonferroni post-hoc comparisons to further evaluate the differences.

3. Results

3.1. General findings

The most common behaviors for the whole sample were HWCB and dieting, with at least one out of five boys reporting being engaged in one or more of these behaviors. The most common form of HWCB was exercise for losing weight (almost 40%). By groups, the highest frequency of BCS to lose/control weight was in the overweight group (see Supplementary Data).

3.2. Logistic regression for the analysis of dichotomous variables

Logistic regression was used to examine the impact of weight status on the dichotomous variables (HWCB, UWCB, and dieting). The results indicated that, in general, having a higher weight status increases the risk of HWCB, UWCB, and dieting. Risk for UWCB, HWCB and dieting was higher in the overweight group than in the normal-weight group (Table 1). By contrast, a statistically significant odds ratio, below one, in HWCB indicated that underweight boys were less likely to report being engaged in HWCB than those in the normal-weight group.

3.3. ANOVA for continuous variables

Table 2 shows the ANOVA results for internalization (general and athletic-ideal), sociocultural pressures, BCS–W and BCS–M.

The results indicated statistically significant differences among groups in general internalization, pressures, and BCS–W. To further

Table 1
Risk of dieting and weight-control behaviors.

Measures	OR[a]	Wald	p	95% CI
Dieting				
UW–NW	0.64	0.65	.418	0.22–1.87
OW–NW	11.10	110.06	*<.001*	7.08–17.41
HWCB				
UW–NW	0.38	7.73	*.005*	0.19–0.75
OW–NW	8.54	62.35	*<.001*	5.02–14.55
UWCB				
UW–NW	1.31	0.51	.475	0.62–2.78
OW–NW	3.68	37.24	*<.001*	2.42–5.59

Note. OR = odds ratio; CI = confidence interval; UW = underweight; NW = normal weight; OW = overweight; HWCB = healthy weight control behaviors; and UWCB = unhealthy weight control behaviors.

[a] Adjusted by socioeconomic status.

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Table 2
Mean, standard deviation and differences between groups on outcome variables.

Measures	UW		NW		OW		F	p	γ_1	CI (95%) γ_1	γ_2	CI (95%) γ_2	γ_3	CI (95%) γ_3
	M	*SD*	*M*	*SD*	*M*	*SD*								
SATAQ-IG	13.49	7.76	13.93	6.47	16.02	7.82	5.03*	*0.007*	−0.45	(−3.01, 2.12)	*−2.08**	(−3.68, −0.49)	−2.53	(−5.30, 0.24)
SATAQ-IA	7.91	4.32	9.40	4.59	9.21	4.64	1.99	0.137	−1.48	(−3.18, 0.22)	0.19	(−0.86, 1.24)	−1.29	(−3.12, 0.54)
SATAQ-P	9.85	5.62	9.24	4.02	11.66	6.05	15.95**	*<0.001*	0.61	(−1.14, 2.37)	*−2.42***	(−3.51, −1.33)	−1.81	(−3.70, 0.08)
BCS–M	3.63	1.95	3.88	1.86	4.11	1.81	0.76	0.467	−0.25	(−0.94, 0.43)	−0.23	(−0.66, 0.19)	−0.49	(−1.22, 0.25)
BCS–W	3.88	2.16	2.58	1.27	2.20	0.60	26.70**	*<0.001*	*1.29***	(0.84–1.75)	*0.39**	(0.10, 0.67)	*1.68***	(1.19, 2.17)

Note. UW = underweight; NW = normal weight; OW = overweight; CI (95%) = confidence intervals at 95% for each comparison; γ1 = comparison between normal-weight and underweight groups; γ2 = comparison between normal weight and overweight; γ3 = comparison between underweight and overweight groups; SATAQ-IG = internalization (general); SATAQ-IA = internalization (athlete); SATAQ-P = perceived pressures; BCS–M = body change strategies to increase muscles; BCS–W = body change strategies to increase weight. Adjusted by socioeconomic status.

* $p < .01$.

** $p < .001$.

evaluate these differences, post-hoc comparisons using the Bonferroni correction test were performed. The results (Table 2) indicated that the overweight group reported significantly higher scores in general internalization and pressures when compared to the normal-weight group. The results also showed that underweight boys were more likely to report BCS–W and, on comparing two weight-status groups, the higher probability of reporting BCS–W was in the group with the lower weight status.

4. Discussion

Confirming our first hypothesis, BCS to lose/control weight were more frequent among overweight boys and BCS–W were more frequent among underweight boys. Previous studies have found these groups to be the most dissatisfied with their bodies (Calzo et al., 2012). These findings, along with own our results, could explain why boys are split between those trying to lose weight and those trying to gain it (Ricciardelli & McCabe, 2004). Future studies might explore whether over-reporting of WCB among overweight boys results from social desirability bias (Stice & Presnell, 2010) and examine the as-yet almost unexplored BCS–W among adolescent boys.

Confirming our second hypothesis, no differences were found among weight-status groups in BCS–M. A review and subsequent studies found no evidence to support the link between BMI and muscle-building behaviors among boys (McVey, Tweed, & Blackmore, 2005; O'Dea & Amy, 2011; Rancourt & Prinstein, 2010; Ricciardelli & McCabe, 2004).

In our third hypothesis, we proposed that underweight and overweight boys will report more sociocultural pressures to change their body appearance, and will show higher levels of internalization. However, our results only partially confirmed this in the overweight group. Mean scores for the overweight group were significantly higher when compared to the normal-weight group in pressures and general internalization. No other statistically significant results were found. The lack of differences between groups in terms of BCS–M and athletic-ideal internalization encourages further research on the idea that boys are concerned with muscularity regardless of their body size (McCabe, Ricciardelli, & Holt, 2010). Our results mirror previous findings of a significant but low positive correlation between BMI and internalization/pressures (e.g. Knauss, Paxton, & Alsaker, 2007). However, not all previous studies have found this association (e.g. Halliwell & Harvey, 2006). Further research is needed to explore these mixed findings.

The present study has a number of strengths. First, our findings contribute to the scarce literature on sociocultural influences and BCS among Spanish adolescent boys. Second, as recommended (Larsen et al., 2007), we measured actual behaviors rather than intentions only. Finally, height and weight were measured in situ, not self-reported.

However, the study has some limitations. First, the sample size in the underweight group was small — though this has been the case in many previous studies (e.g. McCabe & Ricciardelli, 2009). Second, since BMI does not differentiate between muscularity and body fat, future studies should assess muscularity levels. Lastly, the sample is not representative of the entire population of Spanish adolescents.

This study has important implications. Since some anti-obesity campaigns support weight loss as a core public health strategy, this could lead obese people to engage in HWCB, but also in UWCB, a finding supported by our data. Thus, rather than focusing exclusively on weight, inadvertently stigmatizing obese individuals (Vartanian & Smyth, 2013), public health campaigns should follow a wellness approach focusing on overall health. Furthermore, as eating disorders and obesity share some risk factors, such as engagement in WCB, prevention should be based on an integrated approach (Sánchez-Carracedo, Neumark-Sztainer, & López-Guimerà, 2012).

5. Conclusions

Overweight (including obese) boys showed the highest frequency of BCS to lose/control weight and the highest levels of general internalization and sociocultural pressures. In contrast, BCS–W were more common among underweight boys. There were no differences among boys of different weight status in outcomes related to muscularity. Future studies with adolescent boys might explore the impact of public health campaigns promoting weight loss, as well as possible answer bias in the reporting of healthy behaviors, and BCS–W.

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Contributors
All authors participated in the design of the study, data collection, data analyses, contributed to the final manuscript, and they have read and approved the final version.

Conflict of interest
There are no potential conflicts of interest for either author.

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DISCUSIÓN

3.1 Importancia e implicaciones del estudio realizado

En primer lugar, los resultados de la validación del SATAQ-3 confirman la estructura factorial y validez del instrumento para su futuro uso en población adolescente española. Así mismo, el uso del método *Exploratory Structural Equation Modeling (ESEM)*, permitió examinar la invariancia y los resultados confirman la invariancia del instrumento, lo que da garantías para su uso en muestras de adolescentes de diferente sexo y edad. De esta manera se provee ahora a investigadores de habla hispana con un instrumento válido, considerado *gold standard* para la evaluación de las presiones socioculturales y la interiorización del ideal de belleza corporal, unas de las variables más relevantes en el campo del estudio de los factores de riesgo asociados a trastornos de la conducta alimentaria y la imagen corporal.

En segundo lugar, nuestros resultados en el estudio sobre el efecto del peso percibido en las conductas de control del peso, también tienen importantes implicaciones para la prevención y para la investigación futura. En primer lugar, un cuarto de los adolescentes reportó haber realizado dieta en el último año y al menos una conducta no saludable de control de peso, siendo particularmente los adolescentes con sobrepeso y obesos los que practicaban con más frecuencia estas conductas. Como se señaló en la introducción, es probable que algunos de estos adolescentes realicen estas conductas sin supervisión profesional, lo que supone un riesgo para su salud. Por lo tanto, es importante promover patrones de alimentación saludables entre los adolescentes, centrando los esfuerzos en la salud general y la promoción de los hábitos saludables en lugar de limitarlos a la promoción del control y pérdida del peso corporal. En segundo lugar, se observó que los adolescentes con sobrepeso y obesidad tienden a infravalorar su peso, mientras que aquellos con bajo peso tienden a sobreestimarlo. Estos resultados replican hallazgos recientes (Deschamps,

Salanave, Chan-Chee, Vernay, & Castetbon, 2014), y requerirían un mayor estudio. Por ejemplo, es posible que por deseabilidad social los adolescentes con sobrepeso u obesos refieran un menor estatus de peso corporal debido a las presiones socioculturales o al estigma hacia la obesidad (Puhl & Latner, 2007). De manera alternativa, es posible que las normas sociales con relación al peso que definen quién está con sobrepeso estén cambiando, tal y como sugieren algunos estudios (Johnson et al., 2012; Salcedo, Gutiérrez-Fisac, Guallar-Castillón, & Rodríguez-Artalejo, 2010). En todo caso, estudios futuros deberían indagar con mayor detalle sobre estas cuestiones.

Finalmente, nuestro estudio sobre la asociación entre influencias socioculturales y conductas de modificación del cuerpo, es el primero realizado exclusivamente con adolescentes varones españoles considerando su estatus de peso corporal. Nuestros resultados contribuyen así a la escasa literatura sobre el tema. Además, los resultados de este estudio tienen importantes implicaciones para el campo de la prevención. Así, encontramos que, en línea con lo que ya se ha observado con otras poblaciones (Neumark-Sztainer, Wall, Story, & Standish, 2012), los adolescentes con sobrepeso fueron los que realizaban más conductas de control del peso, tanto saludables (e.g. comer más frutas y verduras), como no saludables (e.g. saltarse las comidas), así como los que más puntuaron en interiorización general y presiones socioculturales. Estos resultados son sumamente importantes en la actualidad debido a la gran promoción de campañas de prevención de la obesidad. Como se ha observado en otros países, estas campañas promueven la pérdida de peso, pero inadvertidamente pueden promover la estigmatización de la obesidad (Vartanian & Smyth, 2013). Estas campañas masivas, junto a la estigmatización que la sociedad actual hace de la obesidad, podrían estar promoviendo las conductas de control del peso tanto saludables como no saludables. Por lo tanto, nuestros resultados apoyan la idea de que las campañas de

prevención de la obesidad deberían focalizarse más en la salud general y no sólo en el peso corporal (Sánchez-Carracedo, Neumark-Sztainer, et al., 2012; Vartanian & Smyth, 2013). Además de ello, considerando que las conductas de control del peso pueden constituirse en un factor de riesgo tanto para los trastornos de conducta alimentaria como para la obesidad (Day, Ternouth, & Collier, 2009), las campañas de prevención deberían utilizar un enfoque integrado considerando tanto las diferencias de sexo como de estatus de peso corporal (Sánchez-Carracedo, Neumark-Sztainer, et al., 2012).

3.2 Limitaciones

Si bien nuestros estudios tienen importantes implicaciones, no están exentos de limitaciones. En primer lugar, el estudio de validación del SATAQ-3 se realizó utilizando un método novedoso como es el *Exploratory Structural Equation Modeling (ESEM)*. Este método presenta ventajas frente a las limitaciones de métodos tradicionales como el análisis factorial exploratorio (e.g. imposibilidad de evaluar la invariancia), y el análisis factorial confirmatorio (e.g. es un modelo excesivamente restrictivo). Sin embargo, para realizar el ESEM es exclusivamente necesario actualmente utilizar el programa estadístico M*plus*, lo que es una limitación. Además de ello, cuando se obtienen factores correlacionados, como fue el caso con el SATAQ-3, es recomendable realizar un análisis factorial de segundo orden, pero esto no es posible con el ESEM.

En segundo lugar, en nuestros estudios utilizamos muestras que no son representativas de la población adolescente masculina española, lo que limita la generalización de nuestros resultados. Así mismo, el número de adolescentes de bajo peso fue mucho menor que el número de adolescentes de normo peso y sobrepeso. Aunque esta desproporción ha sido observada en estudios previos (e.g. McCabe & Ricciardelli, 2009), es algo que debe

considerarse al valorar nuestros resultados. Finalmente, si bien utilizamos medidas exactas de peso y talla para calcular el índice de masa corporal (IMC) y luego el estatus de peso corporal, hay que tener en cuenta que el IMC no diferencia entre exceso de peso por exceso de grasa corporal o por exceso de musculatura. Debido a ello, existe la posibilidad de que algunos adolescentes hayan sido clasificados incorrectamente con sobrepeso, como sugieren algunos estudios (Brann, 2008).

3.3 Recomendaciones para estudios futuros

En cuanto al uso del SATAQ-3, se recomienda que en futuras investigaciones se evalúe la factibilidad de evaluar el constructo de interiorización sea como rasgo o como estado, tal y como se ha sugerido recientemente (Karazsia, van Dulmen, Wong, & Crowther, 2013). Así mismo, existe una nueva versión de este instrumento (SATAQ-4), que permite evaluar diferentes fuentes de influencias socioculturales (medios de comunicación, padres, pares), y que está actualmente en evaluación (Thompson, Schaefer, & Menzel, 2012). Si bien un grupo de investigadores en los Estados Unidos ha realizado una adaptación al Español de esta escala para su uso en ese país (Llorente, Gleaves, Warren, Pérez-de-Eulate, & Rakhkovskaya, 2014), es recomendable evaluar la idoneidad del uso de esta escala.

Por otro lado, como se ha observado recientemente, las normas sociales relacionadas al peso corporal influyen en la percepción del propio peso (Perkins et al., 2014). Si bien nuestro estudio no examinó las normas sociales (Almenara et al., 2014), nuestros resultados sugieren que estas normas pueden estar operando e influyendo en la percepción del propio peso corporal y pueden tener un rol en la adopción de conductas de modificación del cuerpo. Por este motivo, se sugiere que se realicen más estudios al respecto en España.

Finalmente, debido a que el uso del índice de masa corporal puede dar lugar a una clasificación incorrecta del estatus de peso corporal en adolescentes varones (Brann, 2008), se recomienda que en futuros estudios se haga uso de otros métodos, tales como la impedancia bioeléctrica (Talma et al., 2013), evaluando su pertinencia en estudios poblacionales.

CONCLUSIONES

El presente estudio provee un instrumento válido para la medición de influencias socioculturales relacionadas al ideal de belleza corporal en población adolescente española de ambos sexos (SATAQ-3).

Adolescentes varones con sobrepeso incluyendo obesidad informaron una mayor frecuencia de práctica de conductas de control del peso y mayores niveles de interiorización y presiones socioculturales. Estudios futuros deberían examinar si esto es en parte debido a efectos indeseados de las actuales campañas de prevención de la obesidad que se centran en el control y pérdida del peso corporal.

La percepción inadecuada del propio peso corporal observada en nuestros resultados, puede ser el producto de influencias socioculturales y/o normas sociales relacionadas al peso corporal. Esta percepción inadecuada está asociada a conductas de modificación del cuerpo, por lo que se recomienda llevar a cabo más estudios al respecto.

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ANEXO

APPENDIX: Spanish version of the SATAQ-3

Factor structure and psychometric information are contained in:

Sánchez-Carracedo, D., Barrada, J.R., López-Guimerà. G., Fauquet, J., Almenara, C. A & Trepat, E. (accepted). Analysis of the factor structure of the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3) in Spanish secondary-school students through exploratory structural equation modeling. *Body Image*

Por favor, lee cada una de las siguientes frases y rodea con un círculo el número que mejor refleja tu acuerdo con cada una de ellas

Completamente en desacuerdo		Ni de acuerdo ni en desacuerdo		Completamente de acuerdo
1	2	3	4	5

1.	Los programas de televisión son una fuente importante de información sobre moda y sobre cómo ser atractivo/a.	1	2	3	4	5
2.	Me he sentido presionado/a por la televisión o las revistas para perder peso.	1	2	3	4	5
3.	No[1] me importa si mi cuerpo se parece o no al de la de gente que sale en la televisión.	1	2	3	4	5
4.	Comparo mi cuerpo con el de la de gente que aparece en la televisión.	1	2	3	4	5
5.	Los anuncios de televisión son una fuente importante de información sobre moda y sobre cómo ser atractivo/a.	1	2	3	4	5
6.	No[1] me siento presionado/a por la televisión o las revistas para estar guapo/a.	1	2	3	4	5
7.	Me gustaría que mi cuerpo se pareciese al de los/as modelos que aparecen en las revistas.	1	2	3	4	5
8.	Comparo mi apariencia física con la de las estrellas de la televisión y del cine.	1	2	3	4	5
9.	Los videos musicales de la televisión no[1] son una fuente importante de información sobre moda y sobre cómo ser atractivo/a.	1	2	3	4	5
10.	Me he sentido presionado/a por la televisión y las revistas para ser delgado/a.	1	2	3	4	5
11.	Me gustaría que mi cuerpo se pareciese al de la gente que aparece en las películas.	1	2	3	4	5
12.	No[1] comparo mi cuerpo con el de la gente que aparece en las revistas.	1	2	3	4	5
13.	Los artículos de las revistas no[1] son una fuente importante de información sobre moda y sobre cómo ser atractivo/a.	1	2	3	4	5
14.	Me he sentido presionado/a por la televisión o las revistas para tener un cuerpo perfecto.	1	2	3	4	5
15.	Me gustaría parecerme a los/as modelos que aparecen en los videos musicales.	1	2	3	4	5
16.	Comparo mi apariencia física con la de la gente que aparece en las revistas.	1	2	3	4	5
17.	Los anuncios en las revistas son una fuente importante de información sobre moda y sobre cómo ser atractivo/a.	1	2	3	4	5
18.	Me he sentido presionado/a por la televisión o las revistas a hacer dieta.	1	2	3	4	5
19.	No[1] deseo estar tan atlético/a como la gente que aparece en las revistas.	1	2	3	4	5
~~20.~~	~~Comparo mi cuerpo con el de la gente que está en buena forma.~~ [2]	1	2	3	4	5
21.	Las fotos de las revistas son una fuente importante de información sobre moda y sobre cómo ser atractivo/a.	1	2	3	4	5
22.	Me he sentido presionado/a por la televisión o las revistas a hacer ejercicio físico.	1	2	3	4	5
23.	Desearía estar tan atlético/a como las estrellas del deporte.	1	2	3	4	5

24. Comparo mi cuerpo con el de la gente que tiene un cuerpo atlético.	1	2	3	4	5
25. Las películas son una fuente importante de información sobre moda y sobre cómo ser atractivo/a.	1	2	3	4	5
26. Me he sentido presionado/a por la televisión o las revistas a cambiar mi apariencia física.	1	2	3	4	5
27. No[1] intento parecerme a la gente que sale en la televisión.	1	2	3	4	5
28. Las estrellas de las películas no[1] son una fuente importante de información sobre moda y sobre cómo ser atractivo/a.	1	2	3	4	5
29. La gente famosa es una fuente importante de información sobre moda y sobre cómo ser atractiva.	1	2	3	4	5
30. Intento parecerme a las deportistas.	1	2	3	4	5

[1] Our results show an anomalous functioning of the negative items. So, we recommend the use of a version without reverse-keyed items
[2] In line with our results, we recommend the removal of item 20 from the SATAQ-3

Internalization-General (items: 3, 4, 7, 8, 11, 12, 15, 16, 27).

Internalization-Athlete (items: 19, 20[a], 23, 24, 30).

Pressures (items: 2, 6, 10, 14, 18, 22, 26).

Information (items: 1, 5, 9, 13, 17, 21, 25, 28, 29).

Reverse-keyed items[a]: 3, 6, 9, 12, 13, 19, 27, 28

[a] Our results support the four-factor solution of the original version, and reveal that the best fit was obtained with ESEM, excluding item 20 and with correlated uniqueness between reverse-keyed items. These data support the use of a version excluding item 20 and without reverse-keyed items.