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HEALTH PSYCHOLOGY | RESEARCH ARTICLE

Sociocultural pressure as a mediator of eating disorder symptoms in a non-clinical Australian sample

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Abstract: Eating disorders continue to be a major cause of concern worldwide. The continuum model of eating disorders proposes (1) that there are *sub-clinical* behaviours or symptoms that differ only by being less frequent and/or severe when compared to those with clinically diagnosed eating disorders and (2) that these behaviours should be studied, including in non-clinical populations. In the present study, perceived social pressure to aspire to a thin ideal was tested as a potential mediator in the relationships between selected sociocultural factors and eating disorder symptomology in a non-clinical sample (comprised of 265 participants aged 18–40 years). Participants completed a series of self-report measures assessing levels of body dissatisfaction and several sociocultural factors (e.g. internalisation of a thin ideal-general and athlete, effects of media pressure and Media Information Influence). The role was also examined of sociocultural pressure as a mediator in the relationships between internalisation (using the media as a source of information regarding physical appearance) and eating disorder symptoms. The results showed that perceived sociocultural pressure was a significant mediator in the relationship between internalisation of the thin ideal (general and athletic) and eating disorder symptoms, and also between Media Information Influence and

ABOUT THE AUTHOR

The three authors worked together on the research reported here and are part of broader research projects on eating disorders supervised by Dr Hicks, Professor of Psychology at Bond University. Linda Pedersen (now Linda Pedersen Clapham) conducted the major data gathering and analyses associated with the current paper, as part of her fourth year psychology thesis. She now also holds a Master of Communication (Advertising). Sharon Rosenrauch holds a Masters in Nutrition, was a senior research assistant and teaching fellow at Bond University until recently and now works in as a Departmental Officer in the Australian Government Department of Health. Richard Hicks has special interests in health psychology research supervision (including in scale development in the assessment of pre-cursors to eating disorders).

PUBLIC INTEREST STATEMENT

Eating disorders continue to be a major cause of concern worldwide. We wished to identify what factors (“precursors”) are associated with eating behaviours that are not yet at a level diagnosed as a disorder but could be seen to be “sub-clinical”. Often these levels are not diagnosed and no advice or treatment that would reduce the possible development of the disorder is given. We believed better management of these factors in a normal population would lead to fewer eating disorder diagnoses and help reduce associated effects such as depression, family concerns and health costs. In particular we examined the relationships of social and cultural influences (such as media pressures emphasising the value of “being thin”), on eating behaviours in a sample of young adult individuals (aged 18–40 years). We found that sociocultural pressures significantly affected eating behaviours in members of our non-clinical sample, and conclude that this information should be more widely available and applied before disorder level eating develops.

eating disorder symptoms. We concluded that sociocultural factors increase the risk of eating disorder symptoms occurring before diagnosis of an eating disorder is made, for those who are susceptible to societal pressures.

Subjects: Health Psychology; Counselling Psychology; Developmental Psychology; Mental Health

Keywords: Thin-ideal internalisation; body dissatisfaction; eating disorder symptoms; sociocultural pressure; media information; continuum model of eating disorders

1. Introduction

Eating disorders (EDs) are multi-faceted illnesses, with certain personality characteristics and socio-cultural influences implicated in their aetiology (Bannatyne & Stapleton, 2014; Culbert, Racine, & Klump, 2015; Rodgers, Paxton, & McLean, 2014; Stice, Schupak-Neuberg, Shaw, & Stein, 1994). The multi-dimensional view of EDs, involving developmental, family and social psychology theoretical bases, is adopted in this paper; it attempts to simultaneously assess the impact of several factors on EDs (Cerniglia et al., 2017; Dakanalis et al., 2015; Levine & Smolak, 2013; Peck & Lightsey, 2008). The American Psychological Association (American Psychiatric Association [APA], 2013) describes EDs as being characterised by abnormal eating patterns, by cognitive distortions related to food and weight, by a persistent course, and by high levels of co-morbid psychopathologies including depression and anxiety and emotional disturbances that affect relationships. There have been many studies on EDs over many years touching on each of these areas and more—for example, on emotional eating as a contributor (Tambelli, Cimino, Cerniglia, & Ballarotto, 2015; Treasure, Stein, & Maguire, 2015); depression and anxiety in relation to ED and family culture and its impacts—(e.g. Cimino, Cerniglia, Paciello, & Sinesi, 2013; Zucker, Moskovich, Vinson, & Watson, 2013); and on early childhood and adolescent periods where the subclinical and clinical eating behaviours may be originating—with some discussion on what age ranges should be included when describing adolescent behaviours (cf., Lu et al., 2015; Marzilli, Cerniglia, & Cimino, 2018), and on what is overweight and relationships with aggression and depression (Cerniglia et al., 2018). EDs are also associated with increased morbidity and/or mortality rates (Arcelus, Mitchell, Wales, & Nielsen, 2011; Smink, van Hoeken, & Hoek, 2012). Other studies discuss specific disorders such as on Anorexia Nervosa (AN) or Bulimia (e.g. Marzilli et al., 2018). We were interested in our study in subclinical eating behaviours and focused on these.

1.1. Prevalence rates of eating disorders and sub-clinical eating behaviour rates

Prevalence rates for clinically diagnosed EDs in the general population are reported at approximately 0.5% for AN, 1–3% for Bulimia Nervosa, and 2–5% for EDs not otherwise specified (Association, 2000). When inclusion criteria for EDs are broadened to include individuals struggling with habitual and persistent but otherwise sub-clinical behaviours, the prevalence rates increase to 31–65% (Corning, Krumm, & Smitham, 2006). Further, the introduction of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association [APA], 2013), which includes classificatory changes to EDs from the earlier edition, will undoubtedly affect reported prevalence rates in the years to come, with marked increases likely (Lindvall Dahlgren & Wisting, 2016).

High prevalence rates of sub-clinical ED behaviours appear to exist across both males and females, and are especially pronounced in an athletic population (Riebl, Subudhi, Broker, Schenck, & Berning, 2007) and those with existing pathologies (Touchette et al., 2011). Although these individuals may display symptoms and experience difficulties that fall below the clinical threshold, such “sub-threshold” difficulties may have serious implications for physical and psychological well-being (Thomas, Vartanian, & Brownell, 2009).

The discrepancy between low prevalence rates for clinically diagnosable EDs and high prevalence rates for individuals struggling with weight, food and body fixation issues, has contributed to increased research efforts to identify risk factors that may mediate the ED–body dissatisfaction

relationship (Bhurtun & Jeewon, 2013; Peck & Lightsey, 2008; Rohde, Stice, & Gau, 2016; Stice, Marti, & Durant, 2011; Whisenhunt, Williamson, Netemeyer, & Andrews, 2003). Several ED prevention programs have been established or examined (e.g. Ebenreuter, 2015; Shaw & Stice, 2016). Not all programs have been highly successful. Results from one meta-analysis revealed that in all the 46 ED prevention programs examined, effect sizes for reduced risk factors and ED symptoms at follow-up were small and may not be clinically significant (Langmesser & Verscheure, 2009). Further research was and is needed. We hoped to contribute via the Australian sample.

1.2. Pre-cursor behaviours and sub-clinical ED symptomatology

The continuum model of EDs (Rodin, Silberstein, & Striegel-Moore, 1985) proposes that sub-clinical behaviours, such as chronic dieting, fasting, compulsive exercising and other potentially dangerous weight control practices, fall somewhere along a continuum, differing in terms of frequency and/or severity when compared to clinically diagnosed EDs (Perosa & Perosa, 2004; Smolak, Levine, & Striegel-Moore, 2013; van den Berg, Mond, Eisenberg, Ackard, & Neumark-Sztainer, 2010). For example, whereas those who display disordered eating may feel temporarily guilty after diverging from their “diet”, a person suffering from a clinical ED is likely to experience excessive, ongoing guilt and is prone to engaging in compensatory or punishing behaviours (Shisslak, Crago, & Estes, 1995).

It has been proposed that individuals who fall somewhere along this continuum share similar psychological characteristics, such as low self-esteem, severe fear of “becoming fat”, and poor body image (Sundgot-Borgen & Torstveit, 2010). It may also be the case that such “at risk” individuals are more sensitive to media messages depicting unhealthy role models, and/or are more likely to rely on information provided by the media regarding physical attractiveness (Schaefer, Harriger, Heinberg, Soderberg, & Thompson, 2016). We examined this aspect further in the current study.

1.3. Body dissatisfaction

Body dissatisfaction, a component of the broader construct of “body image”, has been conceptualised as the extent to which a person’s self-perception of body size is discrepant from their version of an ideal body (Fiske, Fallon, Blissmer, & Redding, 2014). Existing literature (e.g. Ferreira, Pinto-Gouveia, & Duarte, 2013; Fitzsimmons-Craft et al., 2012; Stice et al., 2011) has identified body dissatisfaction as the single most important predictor for eating pathology. Body dissatisfaction has been implicated in dangerous dieting practices, negative affect, and the maintenance of bulimic symptoms (Menzel et al., 2010; Stice & Shaw, 2002). However, body dissatisfaction is not unique to those diagnosed with EDs (Bucchianeri & Neumark-Sztainer, 2014), and is so prevalent, especially amongst females, that it can be considered a “normative discontent” (Rodin et al., 1985). Many females report high body dissatisfaction and “feeling fat” despite falling within a healthy weight range, or even below it (Park, 2011), often as a result of social comparison (Myers & Crowther, 2009). Where do these feelings come from? It has long been held that sociocultural and media pressures and desire to conform are central.

1.4. Sociocultural pressures to aspire to a thin ideal

Sociocultural pressures to aspire to a thin ideal may come from peer groups, parents and friends (Marcos, Sabstian, Aupalata, Ausina, & Treasure, 2013), but it is the Perceived Pressure from media messages that have attracted most research attention (Lopez-Guimera, Levine, Sanchez-Carracedo, & Fauquet, 2010; Pidgeon & Harker, 2013; Schaefer et al., 2016; Thompson, Van den Berg, Roehrig, Guarda, & Heinberg, 2004). The term media has been used to explain communication channels through which news, entertainment, education, data or promotional messages are disseminated, including mediums such as newspapers, magazines, TV, radio, billboards, direct mail and the Internet (Dakanalis et al., 2014).

Subscription to the unrealistic ideals promoted by the media may result in increased body dissatisfaction and dieting, with several studies supporting a link between the media’s promotion

of the “thin ideal” in both the development and treatment outcomes of eating disturbances (Kroon Van & Perez, 2013; Presnell, Bearman, & Stice, 2004; Sepulveda & Calado, 2012; Stice, Ng, & Shaw, 2010). Objectification theory also proposes links between “self-objectification” (shame and concern over body and appearance) arising from media presentations, and disordered eating (Calogero, Davis, & Thompson, 2005; Tiggeman, 2013; Tylka & Hill, 2004).

This link from media exposure has been attributed to “thin ideal internalisation” (Stice & Shaw, 2002), that is, the incorporation of specific sociocultural values to the point that they become internal guiding principles, capable of creating psychological distress and instigating behavioural change (Pidgeon & Harker, 2013; Thompson & Stice, 2001; Thompson et al., 2004; Tiggemann, Polivy, & Hargreaves, 2009). The relentless pursuit of an unrealistically thin body promotes dissatisfaction with one’s current physical appearance (Anschutz, Engels, & Van Strien, 2012; Pokrajac-Bulian, Ambrosi-Randic, & Kucic, 2008; Stice, Gau, Rohde, & Shadw, 2017), with high levels of body dissatisfaction being found to mediate the relationship between ideal internalisation and ED symptomatology (Mancilla-Diaz et al., 2012).

1.5. Internalisation factors, general and athlete models of the “thin ideal”

Two distinct internalisation factors have been identified in the recent literature: one reflects generic media influences related to magazines, TV and movies (Internalisation-General), while the second (Internalisation-Athlete) reflects the internalisation of athletic and sports figures promoting an unrealistic muscular frame associated with performance benefits (Schaefer et al., 2016; Thompson et al., 2004). The latter may be a greater issue in males, whose pursuit of a “muscular ideal” has been linked to dangerous behaviours such as steroid use (Cafri et al., 2005) or to muscle dysmorphia (Dryer, Farr, Hiramatsu, & Quinton, 2016).

Nevertheless, recent investigations into female body image suggest preference is also turning towards an “athletic ideal”, characterised by a toned (as opposed to a thin) body (Bell, Donovan, & Ramme, 2015). Other internalisation factors evident in both sexes include level of perceived media pressure to aspire to a thin ideal (Perceived Pressure), and the extent to which one uses the media as a source of “fact” (Information: Schaefer et al., 2016; Thompson et al., 2004). While being exposed to unrealistic media standards may not be particularly harmful in and of itself, the danger is related to the point at which these ideals become an integral part of one’s identity and self-image (Ramme, Donovan, & Bell, 2016). Some studies have questioned the media portrayals (Levine & Murnen, 2009) and their accuracy (Syed-Abdul et al., 2013).

Particularly amongst adolescent girls, high Perceived Pressure to conform to a thin body ideal and the internalisation of the media’s unrealistic standards, as well as dieting and unhealthy weight loss practices are common (Stice et al., 2017). While males account for approximately 10% of all individuals diagnosed with clinical EDs, these figures are likely an underestimation (Sweeting et al., 2015). Males may have different presentations, with increased muscle mass rather than weight loss being the desired goal (Karazsia, Murnen, & Tylka, 2017).

1.6. Summary and hypotheses

Given the pervasiveness of body dissatisfaction that exists in the general population (Fiske et al., 2014), it is of great importance to identify the factors that influence individuals to progress from body dissatisfaction and seemingly “harmless” dieting practices to more pathological eating disturbances (Ciao, Loth, & Neumark-Sztainer, 2014). The present study examined how certain sociocultural variables combine to influence ED symptomatology. Based on the existing literature, a number of hypotheses were proposed:

Hypothesis 1: That significant relationships would be found between the outcome variable (ED symptomatology) and each of the predictor variables (Gender, Body Dissatisfaction,

Internalisation-General, Internalisation-Athlete, Perceived Pressure, and Media Information Influence--“Information” in brief).

Hypothesis 2: That Perceived Pressure would mediate the relationships between each in turn of the sociocultural influences (Internalisation-General, Internalisation-Athlete, and Media Information) and ED symptomatology.

The measurement instruments used in each case as appropriate included demographic questionnaire responses (e.g. to Body Dissatisfaction levels), responses to a sociocultural influences questionnaire (the SATAQ--see Section 2), and responses to an EDs symptomatology questionnaire (the Body Shape Questionnaire--BSQ--see Section 2).

2. Method

2.1. Participants

The sample comprised 265 participants (54.7% female), aged 18–40 years. Participants were recruited using convenience sampling methods, via the participating university’s Human Research Participant Pool of first year undergraduate students and via online resource contacts (e.g. from Facebook and MySpace), and via “snowball” contacts as respondents were encouraged to invite others to help in the research project. The sample also included invitations to the researchers’ friends and family members as part of the process of attracting a larger sample of respondents. A check of the data entries showed that 105 respondents were university students (40% of the sample). Further comments are available at 2.3 procedure, ahead.

2.2. Materials

The study package was made available online and in hardcopy. Materials included in the package given to participants included the following:

A general demographics questionnaire requiring participants to disclose their age, gender, weight, hours of television watched per week, magazines commonly read and reading frequency, occupational status and profession/industry, and current educational status. Additionally, the questionnaire included a single item self-report measure of Body Dissatisfaction reported on a 4-point Likert scale (1 = very unsatisfied to 4 = very satisfied).

The Body Shape Questionnaire (BSQ-34; Cooper, Taylor, Cooper, & Fairburn, 1987) is a 34-item self-report measure of body shape preoccupations characteristic of AN and Bulimia Nervosa. This instrument was used to measure ED Symptomology in the present study.

Participants were required to provide answers to items (e.g. “feeling fat”) using a 6-point Likert scale (1 = never to 6 = always). BSQ-34 scores range from 34 to 204, with scores of less than 81 suggesting little or no concern over body shape, scores of 81 to 110 suggesting slight worry, scores of 111 to 140 suggesting moderate worry, and scores above 140 suggesting extreme worry (Cooper & Taylor, 1988).

The BSQ-34 has demonstrated concurrent validity with a number of established body satisfaction questionnaires and is suitable for use in both Western and non-Western populations (da Silva, Dias, Maroco, & Campos, 2014), and in community (Loughnan, Mulgrew, & Lane, 2015), athletic (Goltz, Stenzel, & Schneider, 2013), and clinical samples (Probst, Pieters, & Vanderlinden, 2008). The BSQ-34 is also used in clinical assessments for screening individuals at risk for developing EDs (cf., Ebenreuter & Hicks, 2012; Nergiz-Unal, Bilgic, & Yabanci, 2014).

The Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3; Thompson et al., 2004) is a 30-item abbreviated version of the original SATAQ, developed by Heinberg, Thompson, and Stormer (1995), which measures awareness and endorsement of societal influences on body

image and eating disturbances as depicted in the media. The SATAQ-3 is one of the most commonly used and accepted self-report measures of endorsement of Western appearance ideals (Warren, Gleaves, & Rakhkovskaya, 2013).

Participants indicate their level of agreement to items on a 5-point Likert scale (1 = definitively disagree to 5 = definitively agree), with higher scores reflecting a greater amount of perceived media influence. The composite SATAQ-3 score includes reversing eight items.

The SATAQ-3 contains four subscales: Internationalisation-General, Internalisation-Athlete, Perceived Pressure and Information, with higher overall scores indicating greater media endorsement of sociocultural beauty standards depicted in the media (Warren et al., 2013). The Internalisation-General subscale consists of nine items measuring internalisation of the thin-ideal (e.g. “I compare my body to the bodies of people who are on TV”); Internalisation-Athlete consists of five items measuring internalisation of the athletic ideal (e.g. “I try to look like sports athletes”); Perceived Pressure consists of seven items measuring perceived feelings of pressure to conform to the ideals exhibited by the media (e.g. “I’ve felt pressure from TV or magazines to have a perfect body”); Information consists of nine items measuring recognition of the social importance of the media’s messages regarding beauty ideals (e.g. “Magazine advertisements are an important source of information about fashion and being attractive”: Thompson et al., 2004). All four subscales were used in the current study.

The SATAQ-3 has been used with clinical populations (Coughlin et al., 2012), students (Suisman et al., 2012), community samples (Lindsay, Warren, Velasquez, & Lu, 2012) and non-Western populations (Argyrides, Kkeli, & Kendeous, 2014; Warren et al., 2013). High internal consistency has been reported for each of the four subscales: Internalisation-General ($\alpha = 0.96$), Internalisation-Athlete ($\alpha = 0.95$), Perceived Pressure ($\alpha = 0.92$) and Information ($\alpha = 0.96$; Thompson et al., 2004). Although the SATAQ-4 (Schaefer et al., 2016), a more recent version of this instrument is now available, this was published subsequent to the conduct of the current study. There is a strong relationship between the SATAQ-3 and the SATAQ-4 (Schaefer et al., 2016).

2.3. Procedure

The study was approved by the university’s Human Research Ethics Committee (BUHREC Protocol Number: R0815) prior to commencing data collection. Participants were recruited from the university student population, and through online resources such as electronic mail, Facebook and MySpace. Advertisements were also placed on the university research notice boards. Student participants completed the surveys on campus whenever possible. The online survey package was accessible from the web hosting company Survey Monkey, which enabled secure data handling.

Participation was voluntary and anonymous. The test package took approximately 50 min to complete and no incentives were offered, with the exception of course credit for current students. Counterbalancing was used on the online and hardcopy survey packages to reduce order and fatigue effects (Jones & Kenward, 2003).

Statistical analyses involved Pearson product-moment correlations to explore the relationships between the study’s variables (Hypotheses 1 and 2), and to confirm the assumptions for the mediation analyses. Multiple regression analyses were conducted to test the mediation paths, for Hypothesis 3.

3. Results

3.1. Preliminary analyses: inter-correlations

Screening of data lead to eight cases being omitted but otherwise required statistical assumptions being met. Descriptive statistics for all study variables are presented in Table 1 with Pearson product-moment correlations displayed in Table 2.

Table 1. Summary of uncentred means (M) and standard deviation (SD) for predictor and outcome variables by gender

Variable	Females		Males	
	M	SD	M	SD
ED Symptomology	105.20	41.47	71.30	60.36
Body Dissat.	2.57	0.68	2.29	0.81
Internal-G	27.21	5.42	23.71	5.55
Internal-A	14.17	3.37	13.60	3.67
Perceived Pressure	20.94	6.58	14.70	5.67
Information	24.75	5.43	22.65	5.89

Note. ED = eating disorder; Body Dissat. = Body Dissatisfaction; Internal-G = Internalisation-General; Internal-A = Internalisation-Athlete;

Table 2. Pearson inter-correlations between study variables

Variables	1	2	3	4	5	6	7
1 Gender	–	–	–	–	–	–	–
2 Body Dissat.	–.17**	–	–	–	–	–	–
3 ED symptomatology	–.52**	.65**	–	–	–	–	–
4 Internal-G	–.30**	.22**	.42**	–	–	–	–
5 Internal-A	–	.28**	.31**	.47**	–	–	–
6 Perceived Pressure	–.45**	.38**	.63**	.71**	.53**	–	–
7 Information	–.20**	.14*	.22**	.46**	.33**	.49**	–

Note. Body Dissat. = Body Dissatisfaction; ED = eating disorder; Internal-G = Internalisation-General; Internal-A = Internalisation-Athlete.

* $p < .05$. ** $p < .01$. *** $p < .001$, two tailed.

As shown in Table 2, results revealed full support for Hypothesis 1 that there would be significant relationships among the variables. Twenty of the 21 correlations between the pairs of variables were significantly related (Table 2); only the gender and “internalisation-athlete” pair did not reach significance. In particular, significant positive relations were identified between ED symptomatology (BSQ-34 total scores) and Perceived Pressure ($r = 0.63$), Body Dissatisfaction ($r = 0.69$) and Gender ($r = 0.52$). The weakest but also significant association was between ED symptomatology and Media Information Influence ($r = 0.22$). Overall, ED symptomatology appeared to have more substantial relationships with the study variables than did Body Dissatisfaction. Of the four sociocultural measures (Internal-General, Internal-Athlete, Perceived Pressure and Information), Perceived Pressure appeared to have the strongest association with the other study variables.

3.2. Multiple regression analyses

Hypothesis 2, that Perceived Pressure would mediate the relationships between predictor variables: Internalisation-General, Internalisation-Athlete and Information, and the outcome variable (ED Symptoms) were supported. Three separate linear hierarchical multiple regression analyses were conducted to test the mediation effects for Internalisation-General, Internalisation-Athlete and Media Information Influence. Figure 1 illustrates the mediation model tested in the current study.

The analyses were conducted using the step-wise mediation model proposed by Baron and Kenny (1986), which requires three forced entry regressions to determine mediation. Firstly, a simple linear regression examined Internalisation-General as a predictor for ED Symptoms (direct pathway). This determined there was an effect that may be mediated (Figure 1, path c). The second regression analysis examined Internalisation-General as a predictor for the mediator

variable Perceived Pressure (Figure 1, path a). The third analysis examined Perceived Pressure as a predictor for ED symptomatology (controlling for Internalisation-General; Figure 1, path b). In the final step, Internalisation-General was used as a predictor for ED symptomatology, controlling for Perceived Pressure (Figure 1, path c').

Results revealed **Internalisation-General** was associated with ED Symptoms ($\beta = .42, p < .001$) and Perceived Pressure ($\beta = .71, p < .001$). Perceived Pressure (controlling for Internalisation-General) was also associated with ED symptomatology ($\beta = .66, p < .030$).

A second regression analysis revealed Internalisation-General and Perceived Pressure combined significantly to predict ED symptomatology, $R^2_{\text{change}} = .40, F_{\text{change}}(2, 171) = 56.76, p < .001$. However, when controlling for Perceived Pressure, the relationship between Internalisation-General and ED Symptoms was no longer significant ($\beta = -.05, p = .580$), indicating Perceived Pressure fully mediated the relationship between internalisation of the “thin ideal”, and ED Symptoms in this sample. Follow-up analysis using a Sobel (1982) test demonstrated the mediating effects of Perceived Pressure was significant ($z = 5.70, p < .003$).

The stepwise procedure described above was employed to investigate the mediating effect of Perceived Pressure in the relationships between Internalisation-Athlete and ED Symptoms, and between Information and ED symptomatology. Results for each step are presented in Table 3.

Internalisation-Athlete and Perceived Pressure combined to predict ED symptomatology, $R^2_{\text{change}} = .40, F_{\text{change}}(2, 171) = 56.66, p < .001$. However, the predictive effect of Internalisation-Athlete when controlling for Perceived Pressure was found to be nonsignificant ($\beta = -.03, p = .670$). Thus, Perceived Pressure had a fully mediating effect on the relationship between Internalisation-Athlete and ED symptomatology in the present study.

Media Information and Perceived Pressure combined to predict ED symptomatology, $R^2_{\text{change}} = .399, F_{\text{change}}(2, 171) = 56.66, p < .001$. Again, the relationship between Information and ED symptomatology was found to be nonsignificant when controlling for Perceived Pressure ($\beta = -.03, p = .670$), illustrating the fully mediating effect of Perceived Pressure.

Follow up Sobel tests confirmed the significance of Perceived Pressure as a mediator between Internalisation-Athlete and ED symptomatology ($z = 6.34, p < .001$), and between Information and ED symptomatology ($z = 6.26, p < .001$).

Figure 1. Perceived Pressure as a mediator in the relationship between Internalisation-General and eating disorder symptoms (generic mediation model being tested following Baron & Kenny, 1986). Indirect or mediated pathway

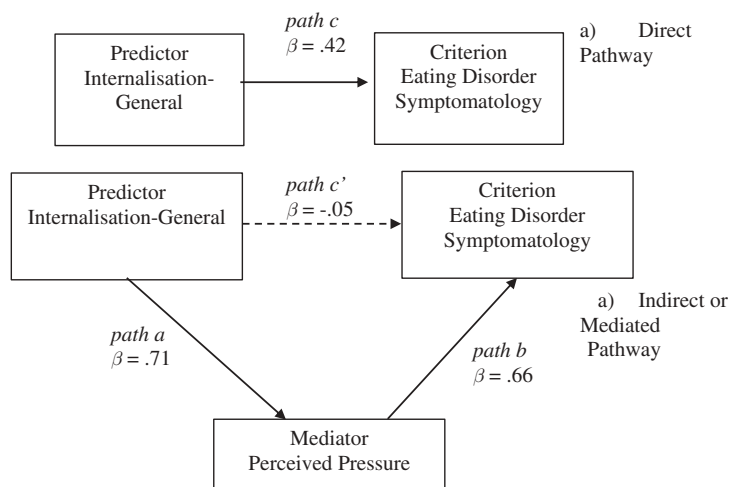


Table 3. Stepwise procedure (Baron & Kenny, 1986) demonstrating mediating effect of perceived sociocultural pressure on the relationship between Internal-Athlete and Information and eating disorder symptomatology

	B	SE B	β
Step 1 path c: Internal-A—ED symptomatology	3.80	0.87	.31**
Step 2 path a: Internal-A—Perceived Pressure	1.05	0.12	.53**
Step 3 path b: Perceived Pressure—ED symptomatology	3.96	0.43	.65**
Step 4 path c': Internal-A × Perceived Pressure—ED symptomatology	-0.37	0.85	-.03
Step1 path c: Information—ED symptomatology	1.73	0.60	.22*
Step 2 path a: Information—Perceived Pressure	0.64	0.08	.49
Step 3 path b: Perceived Pressure—ED symptomatology	4.23	0.42	.70**
Step 4 path c': Information × Perceived Pressure – ED symptomatology	0.97	-0.12	.07**

Note. ED = eating disorder; Internal-A = Internal-Athlete.
 N = 265.
 * $p < .05$. ** $p < .01$. *** $p < .001$

4. Discussion

The current study investigated relationships between several sociocultural variables and disordered eating in a non-clinical, Australian sample. As predicted, significant relationships were identified between ED symptomatology and Body Dissatisfaction, Sociocultural Pressure, Internalisation-Athlete, Internalisation-General and Information. In particular, a strong positive relationship was identified between ED Symptoms and self-rated Body Dissatisfaction, which was expected given the extensive support for the co-occurrence of these variables in the literature (Dakanalis et al., 2015; Tylka & Hill, 2004). Prior research has identified body dissatisfaction as one of the most important predictors of clinical and sub-clinical disordered eating (Ferreira et al., 2013; Stice et al., 2011).

4.1. Perceived sociocultural pressure for thinness

Pressure for thinness was strongly associated with disordered eating and weight concerns in the present sample, consistent with previous research on sociocultural influences (Presnell et al., 2004; Rohde et al., 2016). Of the four sociocultural measures, Perceived Pressure appeared to have the strongest relationships with the other variables, and Information the weakest. This is consistent with prior studies on the use information from the media, where scores on the information subscale did not differ between different levels of body dissatisfaction scores nor between control groups and clinical ED samples (Calogero et al., 2005).

Theorists have argued that clarification of the psychosocial processes that mediate media effects on negative body image and disordered eating are required (Fitzsimmons-Craft et al., 2016; Levine & Murnen, 2009).

Present findings supported Hypothesis 2, with sociocultural pressure for thinness found to have fully mediated the relationship between internalisation (both general and athlete) of the media's standards for what constitutes attractive physical appearance and ED symptomatology. That Perceived Pressure (rather than Internalisation) emerged as the mediating variable differs from

previous research suggesting a causal relationship between Internalisation (the outcome variable) and Perceived Pressure, the predictor variable (Dryer et al., 2016; Pokrajac-Bulian et al., 2008).

4.2. The current results: the influence of perceived media pressure

Results suggest that the internalisation of a thin beauty ideal is associated with higher levels of perceived pressure to conform to these ideals, which appears to be an important factor in the development and maintenance of eating pathology in the non-clinical sample (Rodgers et al., 2014; Stice, 1998). While this appears to be the case across both genders, research suggests adolescent girls (Rodgers et al., 2014) and gay men (Marino-Carper, Negy, & Tantleff-Dunn, 2010) may feel this perceived pressure to achieve attractiveness to a greater extent, and consequently be more at risk of elevating pre-existing adverse ED behaviours. This has been attributed to media messages being portrayed as normative or as the “social standard” to which audiences should aspire (Marcos et al., 2013). This attribution is in contrast to the sociocultural model, which suggests that societal pressures for thinness precede internalisation of the thin ideal (Thompson & Stice, 2001).

Applying a sociocultural model, internalisation is said to lead to body image dissatisfaction (and, in those at risk, to disordered eating) due to the perceived discrepancy between the ideal and personal physical appearance (Rodgers et al., 2014). Results from the present study suggest that perceived pressure to adhere to certain social standards regarding physical appearance may be felt by a wide range of individuals.

Experimental studies have demonstrated that exposure to material depicting women with “ideal figures” results in higher levels of depression, anger, body dissatisfaction, and ED symptomatology in women with high internalisation levels, when compared to those with low internalisation levels (Fitzsimmons-Craft et al., 2012; Tiggemann et al., 2009). Further research is required to clarify the causal sequence of this relationship. Results from a recent longitudinal study have indicated that media-driven ideal internalisation predicts scrutinising of one’s body, which was found to predict subsequent dietary restraint and binge eating in later life (Dakanalis et al., 2014). Further longitudinal studies are required to allow assessment of changes in disordered eating patterns through the transition period of pre- and early adolescence, when media influences on behaviour appear to be prominent (Ebenreuter, 2015; Ebenreuter & Hicks, 2012; Levine & Smolak, 2013).

4.3. Perceived sociocultural pressure and Media Information Influence

Current findings also revealed perceived sociocultural pressure mediated the relationship between media information regarding appearance and ED symptomatology. This is consistent with prior findings that using media as a primary source of information to establish standards for physical appearance is associated with decreased self-esteem, increased body dissatisfaction, and disordered eating that may progress to clinical EDs (Sepulveda & Calado, 2012; Thompson & Heinberg, 1999). Concern has been expressed over women relying on the media for knowledge about weight control practices—which may be harmful, such as laxative and diet pill abuse, self-induced purging and starvation (Whisenhunt et al., 2003). Certain social media platforms have even been seen to be responsible for promoting clinical EDs (e.g. AN) as a “healthy lifestyle” (Syed-Abdul et al., 2013). While being exposed to such information may not be damaging for most individuals, those who internalise these messages may be more likely to act on false or commercially driven advice, potentially to the detriment of their health (Stice et al., 1994). Indeed, successful ED intervention programs have required patients to discuss the costs of pursuing the thin ideal in written, verbal and behavioural exercises in an attempt to reduce thin-ideal internalisation, under the assumption most will be motivated to maintain consistency between their actions and cognitions (Shaw & Stice, 2016).

4.4. Implications for practice from current findings

Findings from the present study may therefore assist in the development of similar prevention programs (to those outlined above) targeted at individuals at risk of developing EDs. Such

programs would focus primarily on changing the perceived pressure to aspire to a thin ideal (the mediating variable) through a variety of psychological interventions. Doing so is likely to reduce the relationship between internalisation and disordered eating. By identifying additional factors that mediate ED processes, mental health professionals may be able to develop more effective and targeted prevention and treatment programs (Shaw & Stice, 2016).

4.5. Limitations and cautions

Despite the insights to be gained from the current study, results must be interpreted in light of certain limitations. First, sample size ($N = 265$) may be considered a problem (we are always looking for larger relevant samples in order to control better for random errors and other factors that may influence results unduly. Nevertheless we used appropriate statistics that are normal in studies of this kind (e.g. in the regression analyses, controlling for known variables). However, second and more important, may be the composition of the sample which including some 40% of university students and 60% non-university students recruited via online/electronic media (Facebook+) and the use of snowballing techniques—that is, inviting friends and others to complete the survey after the respondents completed the surveys themselves. This procedure may recruit sufficient numbers but there are unknown biases that may creep in. Therefore, the results should be treated with caution. We do know that university students (who formed a strong proportion of those studied) may not be representative of the general population on various demographic factors such as socioeconomic status (SES) and education. Higher SES has been associated with increased body dissatisfaction (van den Berg et al., 2010), and thus present results may have been confounded. The study also relied on self-report measures, used a one-item measure of body dissatisfaction, and did not control for social desirability in responses to items—each of these three limitations also affecting the results in an unknown manner. In addition, we did not include assessments of body mass index, though we excluded this aspect the individual's perception of being overweight in the development of ED symptoms appears to be more significant (Bhurtun & Jeewon, 2013). More studies are needed that explore further the effects of some of these omitted variables given changes occurring in society (e.g. the views among adolescents that their increased weight compared with earlier decades is acceptable as a kind of “the new normal”: as indicated earlier—see Cerniglia et al., 2018; Lu et al., 2015).

4.6. Conclusion

This study explored a number of variables related to factors that may lead individuals who fall along the ED continuum to progress from body dissatisfaction to eating pathology. Results suggest sociocultural factors may partially explain this relationship. As the aetiology of EDs is extremely complex, a multi-dimensional and tailored approach to prevention and treatment is required. Our results suggest the importance of addressing sociocultural pressures and influences in a way that may help in prevention and treatment of clinical EDs through earlier attention to sub-clinical eating behaviours and symptoms.

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Competing interests

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