

# Is cultural change associated with eating disorders? A systematic review of the literature

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## Abstract

**Background** There is debate as to whether the development of an eating disorder (ED) may be triggered by acculturation to Western culture. While there is evidence to suggest that acculturation to Western culture is associated with risk of having an ED, these findings are limited, vary significantly, and are sometimes conflicting.

**Aims** To review the literature and empirical data on the association between ED symptoms and acculturation in the context of Western culture.

**Methods** A systematic search of peer-reviewed publications using a combination of the keywords “Culture”, “Acculturation” and “Eating disorders” was first performed in August 2014 and updated in February 2015 with the following databases: PubMed and SCOPUS. Reference lists were also hand searched. In total, the search provided more than 50 studies. Following screening (as stated in the PRISMA guidelines) of the titles and abstracts by inclusion and exclusion criteria and quality assessment of the full text, 25 studies were identified to be appropriate for the review. Articles were examined in relation to the findings, as well as the ED and acculturation measures used.

**Results** Eleven studies suggested considerable association between ED and culture change/acculturation. Six studies suggested little or no association between ED and culture change/acculturation. Eight studies did not primarily examine association, yet generated valuable insight. While there was relative consistency across studies in terms of the ED measures selected, measures of acculturation varied significantly.

**Conclusions** The majority of the evidence reviewed here suggests that there is a substantial association between culture change and ED psychopathology. However, both greater and lesser acculturation have been identified as risk factors for the development of an ED, and this varies depending on the group studied as well as how acculturation and culture change are conceptualized and measured. Further research is warranted to form cross-culturally acceptable definitions and measures of problematic eating, and healthy and high acculturation, to study the relationship between EDs and the process of acculturation to Western culture.

**Keywords** Cross-cultural · Systematic review · Immigration · Acculturation · Eating disorders

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## Introduction

Eating disorders (EDs) have multiple risk and maintenance factors. There are various guidelines and seminal articles urging further research and treatment developments in the field. Throughout the last two decades, biological and genetic research in the ED field has flourished, leading to an improved understanding of aetiology and potential targets for treatment. Unfortunately, research studies investigating the social aspects of EDs, including the needs of patients

from international communities outside of Western Europe and North America, have been scarce.

Acculturation has primarily been defined as “the process of psychosocial change that occurs when a group or individual acquires the cultural values, language, norms, and behaviours of dominant society” (as cited in Wildes et al. [37], p. 524). The aim of this paper is to provide a systematic review of the literature from the last two decades, summarizing evidence regarding whether culture change, either as a result of immigration and acculturation or changes within a culture, leads to elevated levels of ED symptoms and increased risk of developing an ED. Specifically, we will endeavour to examine the impact of Western culture on the occurrence of EDs. The rationale for this is that fashionable emphasis on slenderness and conflicting expectations that lead to extreme identity confusion in young women have long been identified as critical factors in the development of eating disorders [6]; and furthermore, have been associated with the increased prevalence of eating disorders in Western cultures [17].

Since their inception, ED classification systems within the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association [2]) have routinely undergone revision. The most recent version of the DSM (5) has modified the criteria for ED diagnoses such that they are more relaxed and inclusive. This may stem from the difficulties in identifying steady cross-cultural patterns of EDs, and stresses the importance of further research regarding the epidemiology and cross-cultural presentation of disordered eating.

For a long time, Anorexia Nervosa (AN) and Bulimia Nervosa (BN) were considered disorders characteristic of ‘Western’ women as the first studies were primarily based on North American and Western European data. However, studies carried out during the last few decades in Asia, Africa, and Eastern European countries have changed this perspective. In the 1990s, several studies demonstrated that the incidence of EDs among young Asian women who had immigrated to the United States or Western Europe was considerably higher than was previously thought [12]. According to Di Nicola [13], AN develops when there is a high level of stress associated with cultural assimilation; this point was also emphasized by Geller and Thomas [16].

At present, multiple authors believe that culture change is a key factor associated with the development of EDs. Miller and Pumariega [29] reviewed evidence of EDs among Western and ethnic minority groups. They examined the role of cultural change in the development of disordered eating and suggested that culture change, such as via immigration, may be associated with increased vulnerability to EDs. In a qualitative study of young Czech female au-pairs living abroad [31], it was found that

sojourning abroad and the associated loneliness were significant factors in developing an ED.

In this systematic review, we were interested in exploring the current thinking and empirical data on the association between ED symptoms and acculturation, particularly in the context of Western culture. For this purpose, we focused predominantly on research articles published since the year 2000.

## Methods

This review follows the PRISMA statement for reporting systematic reviews and meta-analyses [27]. The following electronic databases were used to identify relevant papers for inclusion in this review: PubMed and SCOPUS. A preliminary search was conducted in August 2014 and this was subsequently updated in February 2015.

A broad search was first run on the literature using the terms “Culture”, “Acculturation” and “Eating disorders” (including “Anorexia” and “Bulimia”). The search was conducted by three researchers (ED, IS and KT) seeking published studies on the basis of the following inclusion criteria:

- A sample of greater than 10 participants
- Measures of acculturation or ethnic identity
- Measures of eating disorder symptoms
- Published in English peer-reviewed journals

Results from these searches were merged for higher reliability. Following the initial identification of relevant published articles, all citations were then obtained. Further relevant references cited in the retrieved papers were pursued.

For the purposes of this review, we selected research articles that primarily looked at the influence of adjusting to a different culture with Western ideals, which encompassed the adjustment of individuals as well as the adjustment of communities in a broader sense, going beyond individual experiences of cultural change and capturing factors such as biculturalism and immigrant generational status. Some of the studies reviewed compared ED prevalence between the immigrant group and corresponding ethnic group residing in their original non-Western countries, which, to a certain degree, also touched the issue of ED development in non-Western countries. In addition, a few studies examined the impact of Western culture within a non-Western country, on the development of ED pathology. We excluded studies examining the differences in ED pathology between ethnic groups within a given country and where culture change or the effects of westernization are not considered.

Furthermore, we have not included studies that investigated more general eating behaviours or attitudes towards weight or shape, as the focus of this review is on *disordered* eating with a focus on weight reduction (i.e. AN and BN). Thus, we also excluded papers reporting on binge eating disorder.

### Results

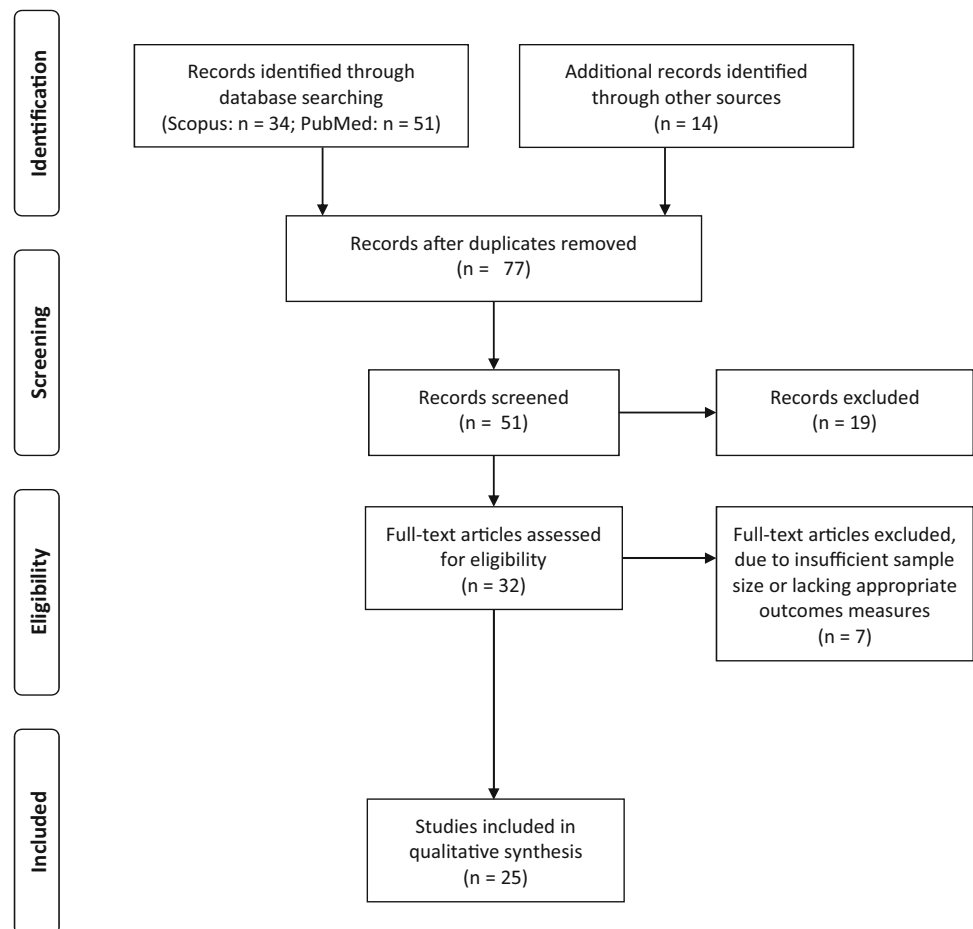
We have reviewed 25 articles reporting on studies that attempted to identify links between EDs or disordered eating patterns on the one hand, and acculturation and culture change on the other (a PRISMA consort diagram is presented in Fig. 1 and Table 1 contains the reviewed studies with their relevant details). The majority of the publications were found in eating disorder-specific journals, most commonly the International Journal of Eating Disorders, while others were found in more general psychology journals. Based on the findings produced by the studies (Table 1), these articles can be divided into three categories: those that examine the relationship between EDs and culture change/acculturation and (A) suggest

considerable association between EDs and culture change/acculturation; (B) suggest little or no association between EDs and culture change/acculturation; (C) do not primarily discuss the association between EDs and culture change/acculturation, yet generate valuable insight on the subject. The studies reviewed varied in terms of the methodologies used to measure the degree of acculturation and the presentation of disordered eating patterns. In this regard, more consistency was observed in assessing ED symptomatology than in identifying the degree or extent of acculturation/culture change.

#### Considerable association between EDs, acculturation and culture change

Multiple authors [8, 10] have pointed out the role of embracing Anglo-cultural orientation in the development of disordered eating among Mexican Americans. According to Chamorro and Flores-Ortiz [10], the increased orientation towards Anglo-American culture among Mexican American women in the US was related to the development of EDs ( $N = 139$  adult females; mean age = 29.1; 57.6 % had been in the US since birth; 36 %, first generation;

**Fig. 1** Consort diagram detailing the study selection process



**Table 1** Table detailing the research articles identified which examine the association between culture change/acculturation and eating disorder symptoms, according to the criteria outlined in the “Method” section

#	Category	Author(s)/title/date	N	Measures of ED symptoms	Measures of acculturation/ethnic identity	Summary of the findings
1	A	Katzman et al. [26] Not your “typical island woman”: Anorexia nervosa is reported only in subcultures in Curacao	12	The Eating Disorder Inventory (EDI) The Eating Attitudes Test (EAT)-26 The Binge Inventory Test, Edinburgh (BITE) Questionnaire for Eating and Weight Problems-revised (QEWPB-R)	The Cross Cultural Questionnaire (CCQ)	Explored cases of anorexia nervosa among a population from a Caribbean island. Quantitative and qualitative measures were taken and focus groups were held with controls. Case studies highlighted the impact of culture changes on the development of EDs
2	A	Cachelin et al. [7] Disordered eating, acculturation, and treatment seeking in a community sample of Hispanic, Asian, black and white women	236	The Eating Disorder Examination (EDE)	Questions devised by the authors	Examined disordered eating, acculturation, and treatment seeking in a community sample of Hispanic, Asian, Black, and White women; found that more acculturated individuals were more likely to have eating problems, and among the ED group, less acculturated individuals were less likely to have received treatment
3	A	Perez et al. [32] The role of acculturative stress and body dissatisfaction in predicting bulimic symptomatology across ethnic groups	118	The Eating Disorder Inventory (EDI) The Stunkard Body Figure Scale (BFS)	The Societal, Attitudinal, Familial and Environmental Acculturative Stress Scale (SAFE)	The findings from this study suggest that the combination of acculturation stress and body dissatisfaction may render minority women more vulnerable to bulimic symptoms, whereas the absence of acculturation stress among minority women may buffer them against bulimic symptoms, even in the presence of body dissatisfaction
4	A	Esteban-Gonzalo et al. [14] Length of residence and risk of eating disorders in immigrant adolescents living in Madrid; the AFINOS study	2077	The SCOFF Eating Disorders Questionnaire	Length of residence (LOR)	Compared the risk of having an ED between immigrant and native adolescents living in Madrid; measured the influence of length of residence on the risk of immigrants
5	A	Sussman et al. [35] Who experiences “America the Beautiful”? Ethnicity moderating the effect of acculturation on body image and risks for eating disorders among immigrant women	353	The Eating Attitudes Test (EAT)-26 The Body Esteem Scale (BES) The Body Parts Satisfaction Scale (BPSS)	Ward’s Acculturation Index (WAI)	A cross-sectional study exploring how ethnicity and acculturation can affect body attitudes and risk of EDs. Found that high acculturation was associated with worsened health outcomes with eastern European immigrant women and better outcomes with Afro-Caribbean and Chinese. Pointed out ethnicity is a moderating factor
6	A	Cachelin et al. [8] Acculturation and Eating Disorders in a Mexican American Community Sample	188	The Eating Disorder Examination (EDE)	The Acculturation Rating Scale for Mexican Americans II (ARSM-A-II) The Multigroup Ethnic Identity Measure (MEIM)	Investigated acculturation and EDs by examining the role of ethnic identity and utilizing a bi-dimensional perspective toward two cultures; pointed out the role of Anglo-cultural orientation in the development of ED

**Table 1** continued

#	Category	Author(s)/title/date	N	Measures of ED symptoms	Measures of acculturation/ethnic identity	Summary of the findings
7	A	Jennings et al. [23] Acculturation and eating disorders in Asian and Caucasian Australian adolescent girls	42	The Eating Attitudes Test (EAT)-26 The Eating Disorder Inventory II (EDI-2) The EDI-Symptom Checklist (EDI-SC)	The Acculturation Index	Investigated the relationship between acculturation and the attitudes and psychopathology of ED among Asian girls; identified healthier eating attitudes and psychopathology toward eating among the less acculturated
8	A	Ball and Kenardy [3] Body weight, body image, and eating behaviours: Relationships with ethnicity and acculturation in a community sample of young Australian women	14779	The Eating Disorder Examination Screening Version (EDE-S) Likert scales measuring body weight dissatisfaction and dieting	Length of residence (LOR)	Investigated associations between ethnicity, acculturation status and risk factors for ED; identified risk factors for ED across a range of ethnic groups and positive association between the length of time spent in Australia and weight-related values and behaviours similar to those of Australian-born women
9	A	Chamorro and Flores-Ortiz [10] Acculturation and disordered eating patterns among Mexican American women	139	The Eating Attitudes Test (EAT)-26	The Acculturation Rating Scale for Mexican Americans (ARSMA)	Found that second-generation Mexican American women endorsed the most disordered eating patterns and the highest degrees of concurrent acculturation, out of the five generations studied
10	A	Greenberg et al. [19] Cultural correlates of eating attitudes: a comparison between native-born and immigrant university students in Israel	499	The Eating Attitudes Test (EAT)-26	Length of residence (LOR)	Explored the association between exposure to Western culture and attitudes toward abnormal eating behaviours and attitudes. Findings showed that Israeli and veteran immigrant women had significantly higher positive scores compared with new immigrant women. Suggested rapid cultural effects in attitudes toward EDs and proportion of obesity
11	A	Mussap [30] Acculturation, body image, and eating behaviours in Muslim-Australian women	101	The Eating Disorder Examination Questionnaire (EDE-Q) The Questionnaire of Eating and Weight Patterns-Revised (QEWP-R)	The Vancouver Index of Acculturation (VIA) The Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3)	The relationship between western acculturation, body dissatisfaction, and eating behaviours was examined in a sample of Muslim-Australian women. Significant positive relationships between mainstream identification and the measures of body dissatisfaction and disordered eating that were mediated by thin-ideal internalization were identified, as well as significant negative relationships between heritage identification and the measures of body dissatisfaction and disordered eating that were mediated by self-esteem
12	B	Abdollahi and Mann [1] Eating Disorder Symptoms and Body Image Concerns in Iran: Comparisons between Iranian Women in Iran and in America	104	The Eating Disorder Examination Questionnaire (EDE-Q)	Length of residence (LOR) Likert scales devised by the authors	Reported that neither exposure to Western media nor acculturation to western norms appeared to be related to symptoms of disordered eating and body image concerns in this sample

Table 1 continued

#	Category	Author(s)/title/date	N	Measures of ED symptoms	Measures of acculturation/ethnic identity	Summary of the findings
13	B	Tsai et al. [36] Sociocultural and developmental influences on body dissatisfaction and disordered eating attitudes and behaviours of Asian women	645	The Eating Attitudes Test (EAT)-26 The Eating Disorder Inventory (EDI)	The Taiwanese Ethnic Identity Scale (TEIS)	Examined the influence of sociocultural and developmental factors on body dissatisfaction and disordered eating attitudes and behaviours in two Asian populations: Taiwanese-American women undergoing acculturating changes and Taiwanese women undergoing modernizing changes. Contrary to the initial hypothesis, body dissatisfaction rates and disordered eating attitudes and behaviours were found to be significantly higher in the Taiwanese group
14	B	Jennings et al. [24] Acculturation and eating disorders in Asian and Caucasian Australian university students	240	The Eating Attitudes Test (EAT)-26 The Eating Disorder Inventory II (EDI-2) The EDI-Symptom Checklist (EDI-SC)	The Acculturation Index	This study suggests that Asian and Caucasian university students in Western Australia are equally susceptible to EDs, and that the level of acculturation does not modify the susceptibility of Asian students for EDs
15	B	Soh et al. [34] Restraint and eating concern in North European and East Asian women with and without eating disorders in Australia and Singapore	154	The Eating Disorder Examination Questionnaire (EDE-Q)	The Vancouver Index of Acculturation (VIA)	Found that eating concern was not associated with cultural group overall or acculturation to Western culture. Concludes that in eating disorder psychopathology, the specific symptom of eating concern may transcend cultural influences
16	B	Iyer and Haslam [21] Body image and eating disturbance among South Asian-American women: The role of racial teasing	122	The Eating Attitudes Test (EAT)-26 The Body Shape Questionnaire (BSQ)	The Multigroup Measure of Ethnic Identity (MEIM) The Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA)	Among a sample of college women of South Asian descent, it was found that a history of hurtful racial teasing, but not acculturation or ethnic disidentification, was associated with disturbed eating and body image, even after controlling for distress, self-esteem, and body mass
17	B	Lake et al. [28] Effect of Western culture on women's attitudes to eating and perceptions of body shape	140	The Eating Attitudes Test (EAT) The Figure Rating Scale (FRS)	The Ethnic Identity Scale (EIS)	Western acculturated Hong Kong-born subjects reported significantly lower levels of negative attitudes toward eating and dissatisfaction with body shape than the Australian-born subjects, whereas the more traditional Hong Kong-born subjects reported equivalent scores
18	C	Jackson et al. [22] Trans-cultural Comparison of Disordered Eating in Korean Women	1140	The Eating Attitudes Test (EAT)-26	The Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA)	Supported the importance of native cultural factors in the development of eating disorders in non-Western contexts

**Table 1** continued

#	Category	Author(s)/title/date	N	Measures of ED symptoms	Measures of acculturation/ethnic identity	Summary of the findings
19	C	Yamamiya et al. [37] The Tripartite Influence Model of Body Image and Eating Disturbance: A Replication with a Japanese Sample	289	The Eating Disorder Inventory II (EDI-2) The Eating Attitudes Test (EAT)-26	The Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) The Ethnic Identity Scale (EIS)	Suggested that the sociocultural variables found to influence body image and eating disturbances in Japan are similar to those observed in US samples
20	C	Humphry and Ricciardelli [20] The development of eating pathology in Chinese-Australian women: acculturation versus culture crash	81	The Eating Attitudes Test (EAT)-26	The Perceived Sociocultural Influences on Body Image and Body Change Questionnaire (PSIQ)	Examined the influence of acculturation versus culture clash on the development of eating pathology in Chinese-Australian women; suggested both similarities and differences between the risk factors that correlate with eating pathology
21	C	Barry and Garner [5] Eating concerns in East Asian immigrants: relationships between acculturation, self-construal, ethnic identity, gender, psychological functioning and eating concerns	150	The Eating Attitudes Test (EAT)-26	The East Asian Acculturation Measure (EAAM) The East Asian Ethnic Identity Scale (EAEIS) The Self-Construal Scale (SCS)	Culturally relevant variables, namely acculturation, self-construal and ethnic identity, were related to only certain facets of eating concerns in a group of East Asian immigrants. The findings suggest the importance of assessing discrete, psychologically relevant facets of culture rather than more global constructs such as westernization when examining eating concerns in immigrant populations
22	C	Sánchez-Johnsen et al. [33] Correlates of problematic eating behaviours in less acculturated Latinas	349	The Questionnaire of Eating and Weight Patterns-Revised (QWEP-R) The Figure Rating Scale (FRS)	The Short Acculturation Scale (SAS)	In a group of less acculturated Latina women, it was found that those with high depression scores were 16 times more likely to be assigned to the EDNOS-BN group than were women with lower depression scores
23	C	Gordon et al. [18] Cultural Body Shape Ideals and Eating Disorder Symptoms Among White, Latina, and Black College Women	276	The Eating Disorder Inventory (EDI) The Stunkard Body Figure Scale (BFS)	The Stephenson Multigroup Acculturation Scale (SMAS) The Societal, Attitudinal, Familial and Environmental Acculturative Stress Scale (SAFE)	This study examined relationships between body image, ED symptoms, and acculturation-relevant variables among a sample of white, black and Latina college women. Higher levels of acculturative stress, but not acculturation, were associated with ED symptoms among Black women and Latinas
24	C	Chan and Glynn Owens [11] Perfectionism and eating disorder symptomatology in Chinese immigrants: Mediating and moderating effects of ethnic identity and acculturation	301	The Eating Disorder Inventory (EDI)	The Multigroup Ethnic Identity Measure (MEIM)	Among a sample of Chinese immigrants, strong positive evaluation of other ethnic groups together with high perfectionism predicted lower body dissatisfaction and drive for thinness, whereas the opposite was true for a more negative evaluation of other groups and high perfectionism. A strong sense of belonging and attachment towards the Chinese culture and valuing other ethnic groups were found to mediate the relationship between perfectionism and ED symptoms, predicting a lower sense of interpersonal distrust

Table 1 continued

#	Category	Author(s)/title/date	N	Measures of ED symptoms	Measures of acculturation/ethnic identity	Summary of the findings
25	C	Pavlova et al. [31] It Would Not Have Happened to me at Home: Qualitative Exploration of Sojourns Abroad and Eating Disorders in Young Czech Women	13	The Eating Disorder Examination Questionnaire (EDE-Q) Semi-structured in-depth interviews and internet testimonies.	Questions devised by the authors	Explored associations between sojourns abroad and the onset and course of ED; identified trajectories relating ED to sojourns abroad; suggested to estimate the importance of the identified ED trajectories in an epidemiological study

N number of the participants in the study, A studies showing considerable association between eating disorders and culture change/acculturation, B studies showing little or no association between eating disorders and culture change/acculturation, C studies that do not primarily discuss the association between eating disorders and culture change/acculturation, yet generate valuable insight on the subject

37.4 %, second generation); furthermore, their findings suggested that second-generation immigrants were at higher risk of developing EDs as they exhibited both the most disordered eating patterns and the highest degrees of acculturation. Cachelin and colleagues [8] reported a similar pattern with regard to the influence of culture on the development of EDs; however, they found no relationship between the presence of EDs and generational status ( $N = 188$  adult females; aged 18–48; 79 with eating disorders and 109 controls).

Furthermore, Ball and Kenardy [3] identified a positive association between the length of time spent by immigrant women in Australia and the presence of weight-related values and behaviours similar to those of Australian-born women ( $N = 14,779$  adult females; aged 18–23; a community sample randomly selected from the national healthcare database). Consistent with these findings, a study from Israel [19] revealed that native-born Israeli and veteran immigrant women were more likely to exhibit ED symptoms than were women who had immigrated more recently ( $N = 499$  higher education students; 281 females, 218 males; aged 18–24 with mean age = 23; 216 Israeli natives, 153 3 years or fewer immigrants and 130 veteran immigrants).

On the other hand, findings from a study conducted in Spain by Esteban-Gonzalo and collaborators [14] found a greater risk of EDs in adolescent female immigrants living in Spain for fewer than 6 years compared to the risk in female natives and female immigrants living in the country for more than 6 years ( $N = 2077$  adolescents; 1052 females, 1025 males; aged 13–17); thereby suggesting that lengthier residence, or greater acculturation, is a protective factor against the development of EDs in adolescents (it should be noted, however, that 80 % of the immigrant population in this study represented immigrants from Latin American countries who are native Spanish-speakers). Similarly, a study carried out in Australia by Jennings and colleagues [23] revealed that less acculturated Asian adolescent females aged 14–17 exhibited greater ED psychopathology than those who were more acculturated ( $N = 42$  non-clinical adolescent girls; aged 14–17; 17 Asian and 25 Caucasian). This led to the authors concluding that ED psychopathology may be the result of an individual's attempt to identify with two different cultures and that the decreased rates of illness over time may be explained by the fact that the less acculturated group is still adjusting to the dominant culture, while the more acculturated group is more at ease.

Interestingly, while studying the effect of acculturation on body image and risk of ED among various groups (Eastern European, Chinese and Afro-Caribbean) of immigrant women in the United States, Sussman et al. [35] found that long-term acculturation over generations was



associated with increasingly negative health consequences for women of Eastern European descent and increasingly positive outcomes for women of Chinese and Afro-Caribbean descent ( $N = 353$  female undergraduate students; aged 18–67 with mean age = 23.7; 187 first generation with 46 Chinese, 88 Afro-Caribbean and 53 Eastern European heritage; 36 second generation with 15 Chinese, 15 Afro-Caribbean and 6 Eastern European heritage; 130 third generation with 84 European-American and 46 African-American heritage). In other words, acculturation was found to be a risk factor only among women of Eastern European descent, who also, compared to the women of Afro-Caribbean descent, were more likely to adapt to an American identity. Thus, the authors concluded that ethnicity had a discernible moderating effect on the impact of acculturation on risks for an ED.

### **Little or no association between EDs, acculturation and culture change**

Some authors [15, 34] have suggested that eating concerns are not associated with acculturation to Western culture. A study by Soh et al. [34] on eating concerns among North European and East Asian (Chinese, Vietnamese, Korean and Singaporean) women with and without an ED in Australia and Singapore found that women with an ED had similar levels of psychopathology across the cultural groups and eating concerns were not associated with cultural group overall or acculturation to Western culture ( $N = 154$  adult females; aged 14–38; with and without an ED; born in Australia or migrated to Australia by the age of 12).

Another study exploring disordered eating and degree of acculturation among Asian and Caucasian adolescent girls in Australia [24] found no significant differences between the racial groups or between the more acculturated and less acculturated Asian girls, thus suggesting that the level of acculturation does not modify susceptibility for developing an ED ( $N = 240$  adolescent females; aged 18–24; 130 Asian and 110 Caucasian). Consistent with these findings, Abdollahi and Mann [1] reported that acculturation to Western norms did not appear to be related to symptoms of disordered eating in Iranian women in Iran and America ( $N = 104$  female students; 59 Iranian living in Tehran and 45 of Iranian decent living in Los Angeles).

### **Valuable insight into the association between EDs, acculturation and culture change**

A study on the development of eating pathology in Chinese-Australian women [20] examined the relationship between acculturation and eating pathology and found both similarities and differences between the more acculturated and less acculturated groups: specifically, those who

reported the highest levels of eating pathology were acculturated women who perceived higher levels of pressure from their fathers and best male friends to lose weight, and traditional women who experienced higher levels of parental care ( $N = 81$  Chinese-Australian women with a mean age of 28.6). Another study [5] on Asian immigrants found that acculturation was related to only certain facets of eating concerns, thereby emphasizing the importance of assessing the psychologically relevant facets of culture versus the global construct of westernization ( $N = 150$ , 75 males, 57 females; non-clinical East Asian immigrants). A qualitative exploration of young Czech au-pairs [31] generated valuable insight on how the individual conditions, such as feelings of boredom and isolation, of women temporarily residing in a foreign country (not immigrants) may exacerbate acculturative stress and ED risks (six semi-structured interviews with adult females with an ED and history of sojourning abroad, aged 20–27, and seven first-person internet testimonies analysed).

## **Discussion**

The aim of this study was to synthesize the literature from the last two decades on the association between ED symptoms and acculturation, particularly in the context of Western culture. The majority of the evidence reviewed here suggests that there is a notable association between culture change and ED psychopathology. Interestingly, while some studies have found that greater acculturation is associated with increased susceptibility to developing an ED, others have identified that less acculturated individuals are more vulnerable to EDs. Furthermore, the nature of the association appears to be largely dependent upon the group studied, and how acculturation and culture change are defined, conceptualized and measured.

Examination of the methodologies utilized by the studies included in this review showed that measures of acculturation varied significantly both conceptually and architecturally, which may in part explain the inconsistencies in findings. While a few studies used ‘length of residence’ (LOR) as a measure of acculturation, most studies utilized uni-dimensional or bi-dimensional models. Uni-dimensional measures of acculturation place individuals on a linear continuum of identities ranging from exclusively heritage oriented to exclusively mainstream oriented, while bi-dimensional models treat cultural maintenance and adoption as two distinct dimensions, thereby allowing for the possibility of having two or neither cultural identities [9, 25].

Berry and colleagues (cited [25]) identified four types of acculturation style: integration (interest in maintaining both cultural identities); assimilation (interest in maintaining

only mainstream cultural identity); separation (interest in maintaining only original cultural identity); and marginalization (little interest in maintaining either cultural identity). According to Berry [4], while there are individual differences in how people experience acculturation, those pursuing the integration strategy generally experience less stress and achieve superior adaptation outcomes. This suggests that healthy acculturation is contingent on maintaining two cultural identities.

If we rely upon this theory and assume that the healthiest style of acculturation is through integration, then studies using uni-dimensional models which identify individuals as being “more acculturated” may mean that they are either more assimilated or more integrated. For instance, the two aforementioned studies on Mexican Americans [8, 10] which produced somewhat conflicting findings about the same group with regards to generational status and ED, employed different measures of acculturation: while the former utilized a uni-dimensional measure (the Acculturation Rating Scale for Mexican Americans, which differentiates between five levels of acculturation from Very Mexican to Very Anglicized), the latter used a bi-dimensional measure (the Acculturation Rating Scale for Mexican Americans—II). It is clear that in linear, or uni-dimensional, measures, “assimilated” individuals would most likely score highly, whereas “integrated” individuals would not. This demonstrates the distinction between “healthy acculturation” and “high acculturation”, and the inconsistencies stemming from different measures of acculturation utilized by different researchers, which might partly explain the conflicting findings in this review.

Another important point is that when referring to acculturation, many researchers have applied the term in reference to Western culture, whereas change from Western to non-Western culture, to our knowledge, has not been studied in relation to ED psychopathology. While many authors have argued that increased exposure to Western culture may facilitate the development of EDs, it is quite possible that culture change per se, and not just acculturation to Western culture, is a contributing factor. Besides, researchers need to be clear and consistent in how they define “Western” and “non-Western”. Furthermore, the proximity (perhaps both geographical and cultural) between origin and host cultures also seems to be an important factor to consider. In their study on immigrants in Madrid, Esteban-Gonzalo et al. [14] found a greater risk of EDs in adolescent female immigrants living in Spain for fewer than 6 years compared to the risk in female natives and female immigrants living in the country for more than 6 years. However, 80 % of the immigrants studied happened to be from Latin American countries and, therefore, native Spanish-speakers, which limits the generalizability of these findings.

Considering the heterogeneity of our findings, it seems important that future studies track and differentiate certain key demographic factors which significantly influence how people experience culture change. None of the studies reviewed here examined the importance of immigrant characteristics such as voluntary versus forced immigration, immigration with family versus alone, or legal versus illegal immigration. These factors are likely to interact with acculturative stress and are therefore highly relevant for the first, and perhaps subsequent, generations of immigrants. Furthermore, these findings highlight the importance of forming a cross-culturally acceptable definition of the term ‘ethnicity’. For instance, in the study by Sussman et al. [35], ‘Eastern-European’ is presented as an ethnicity although it pertains to a region with more than 20 different ethnicities.

Overall, the variety of findings discussed in this systematic review clearly indicates that researchers need to separate out the different domains of acculturation and examine more precisely how they are each related to certain facets of eating concerns. It seems critical to explore the process of culture change/being exposed to a dominant foreign culture, and carefully define the stage at which the individual is at a given time. It also appears important to explore the situation in which he/she is at a given moment, and examine associated adjustment stress and mental health risks. Assessing how the individual is coping with being torn between two cultures seems crucial, and intercultural proximity may also be a factor to consider.

In conclusion, further research is warranted to: (a) explore the presentation of disordered eating in different cultures and form cross-culturally acceptable definitions and measures of problematic eating; (b) examine the various facets of culture change and refine the definitions of healthy and high acculturation; (c) study and generate valuable findings on the relationship between EDs and the process of acculturation to Western culture; and (d) most importantly, inform professional communities, policy makers and the general public on the risks and coping skills associated with culture change and acculturation.

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## References

1. Abdollahi P, Mann T (2001) Eating disorder symptoms and body image concerns in Iran: comparisons between Iranian women in

- Iran and in America. *Int J Eat Disord* 30:238–259. doi:[10.1002/eat.1083](https://doi.org/10.1002/eat.1083)
2. American Psychiatric Association (2013) *Diagnostic and Statistical Manual of Mental Disorders: DSM-5*. American Psychiatric Association, Washington, D.C
  3. Ball K, Kenardy J (2002) Body weight, body image, and eating behaviours: relationships with ethnicity and acculturation in a community sample of young Australian women. *Eat Behav* 3:205–216. doi:[10.1016/S1471-0153\(02\)00062-4](https://doi.org/10.1016/S1471-0153(02)00062-4)
  4. Berry JW (2005) Acculturation: living successfully in two cultures. *Int J Intercult Relat* 29:679–712. doi:[10.1016/j.ijintrel.2005.07.013](https://doi.org/10.1016/j.ijintrel.2005.07.013)
  5. Barry DT, Garner DM (2001) Eating concerns in East Asian immigrants: relationships between acculturation, self-construal, ethnic identity, gender, psychological functioning and eating concerns. *Eat Weight Disord* 6:90–96. doi:[10.1007/BF03339757](https://doi.org/10.1007/BF03339757)
  6. Bruch H (1973) *Eating disorders: obesity, anorexia and the person within*. Basic Books, New York
  7. Cachelin FM, Veisel C, Barzegarnazari E, Striegel-Moore RH (2000) Disordered eating, acculturation and treatment-seeking in a community sample of hispanic, asian, black, and white women. *Psychol Women Q* 24(3):244–253. doi:[10.1111/j.1471-6402.2000.tb00206.x](https://doi.org/10.1111/j.1471-6402.2000.tb00206.x)
  8. Cachelin FM, Phinney JS, Schug RA, Striegel-Moore RH (2006) Acculturation and eating disorders in a Mexican American community sample. *Psychol Women Q* 30:340–347. doi:[10.1111/j.1471-6402.2006.00309.x](https://doi.org/10.1111/j.1471-6402.2006.00309.x)
  9. Celenk O, Van de Vijver F (2011). Assessment of acculturation: issues and overview of measures. *Online Read Psychol Cult* 8(1). doi:[10.9707/2307-0919.1105](https://doi.org/10.9707/2307-0919.1105)
  10. Chamorro R, Flores-Ortiz I (2000) Acculturation and disordered eating patterns among Mexican American women. *Int J Eat Disord* 28:125–129. doi:[10.1002/\(SICI\)1098-108X\(200007\)28:1<125::AID-EAT16>3.0.CO;2-9](https://doi.org/10.1002/(SICI)1098-108X(200007)28:1<125::AID-EAT16>3.0.CO;2-9)
  11. Chan CKY, Glynn Owens R (2006) Perfectionism and eating disorder symptomatology in Chinese immigrants: mediating and moderating effects of ethnic identity and acculturation. *Psychol Health* 21(1):49–63. doi:[10.1080/14768320500105312](https://doi.org/10.1080/14768320500105312)
  12. Davis C, Katzman MA (1999) Perfection as acculturation: a study of the psychological correlates of eating problems in Chinese male and female students living in the United States. *Int J Eat Disord* 25:65–70. doi:[10.1002/\(SICI\)1098-108X\(199901\)25:1<65::AID-EAT8>3.0.CO;2-W](https://doi.org/10.1002/(SICI)1098-108X(199901)25:1<65::AID-EAT8>3.0.CO;2-W)
  13. Di Nicola V (1990) Anorexia multiform: self-starvation in historical and cultural context: anorexia nervosa as a culture-reactive syndrome. *Transcult Psychiatr Res Rev* 27:245–286. doi:[10.1177/136346159002700401](https://doi.org/10.1177/136346159002700401)
  14. Esteban-Gonzalo L, Veiga OL, Gomez-Martinez S, Veses AM, Regidor E, Martinez D, Calle MA (2014) Length of residence and risk of eating disorders in immigrant adolescents living in Madrid; the AFINOS study. *Nutricion Hospitalaria* 29: 1047–1053. doi:[10.3305/nh.2014.29.5.7387](https://doi.org/10.3305/nh.2014.29.5.7387)
  15. Fitcher MM, Quadflieg N, Georgopoulou E, Xepapadakos F, Fthenakis EW (2005) Time trends in eating disturbances in young Greek migrants. *Int J Eat Disord* 38(4):310–322. doi:[10.1002/eat.20187](https://doi.org/10.1002/eat.20187)
  16. Geller G, Thomas CD (1999) A review of eating disorders in immigrant women: possible evidence for a culture-change model. *Eat Disord* 7:279–297. doi:[10.1080/10640269908251200](https://doi.org/10.1080/10640269908251200)
  17. Gordon RA (2000) *Eating disorders: anatomy of a social epidemic*, 2nd edn. Blackwell, Oxford
  18. Gordon KH, Castro Y, Sitnikov L, Holm-Denoma JM (2010) Cultural body shape ideals and eating disorder symptoms among white, latina, and black college women. *Cult Divers Ethnic Minor Psychol* 16:135–143. doi:[10.1037/a0018671](https://doi.org/10.1037/a0018671)
  19. Greenberg L, Cwikel J, Mirsky J (2007) Cultural correlates of eating attitudes: a comparison between native-born and immigrant university students in Israel. *Int J Eat Disord* 40:51–58. doi:[10.1002/eat.20313](https://doi.org/10.1002/eat.20313)
  20. Humphry T, Ricciardelli L (2004) The development of eating pathology in Chinese–Australian women: acculturation versus culture crash. In: *Proceedings of the 38th APS annual conference: development through diversity*. Melbourne Australian Psychological Society, Melbourne, Victoria, pp 93–97. doi:[10.1002/eat.10269](https://doi.org/10.1002/eat.10269)
  21. Iyer DS, Haslam N (2003) Body image and eating disturbance among south asian-american women: the role of racial teasing. *Int J Eat Disord* 34(1):142–147. doi:[10.1002/eat.10170](https://doi.org/10.1002/eat.10170)
  22. Jackson SC, Keel PK, Lee YH (2006) Trans-cultural comparison of disordered eating in Korean women. *Int J Eat Disord* 29:498–502. doi:[10.1002/eat.20270](https://doi.org/10.1002/eat.20270)
  23. Jennings PS, Forbes D, McDermott B, Juniper S, Hulse G (2005) Acculturation and eating disorders in Asian and Caucasian Australian adolescent girls. *Psychiatry Clin Neurosci* 59:56–61. doi:[10.1111/j.1440-1819.2005.01332.x](https://doi.org/10.1111/j.1440-1819.2005.01332.x)
  24. Jennings PS, Forbes D, McDermott B, Hulse G (2006) Acculturation and eating disorders in Asian and Caucasian Australian university students. *Eat Behav* 7:214–219. doi:[10.1016/j.eatbeh.2005.08.006](https://doi.org/10.1016/j.eatbeh.2005.08.006)
  25. Kang SM (2006) Measurement of acculturation, scale formats, and language competence; their implication for adjustment. *J Cross Cult Psychol* 37:669–693. doi:[10.1177/0022022106292077](https://doi.org/10.1177/0022022106292077)
  26. Katzman MA, Hermans KME, van Hoeken D, Hoek HW (2004) Not your “typical island woman”: anorexia nervosa is reported only in subcultures in Curacao. *Cult Med Psychiatry* 28:463–492. doi:[10.1007/s11013-004-1065-7](https://doi.org/10.1007/s11013-004-1065-7)
  27. Liberati A, Altman D, Tetzlaff J, Mulrow C, Gotzsche P, Ioannidis J, Moher D (2009) The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *Ann Intern Med* 151:65–94. doi:[10.7326/0003-4819-151-4-200908180-00136](https://doi.org/10.7326/0003-4819-151-4-200908180-00136)
  28. Lake AJ, Staiger PK, Glowinski H (2000) Effect of Western culture on women’s attitudes to eating and perceptions of body shape. *Int J Eat Disord* 27(1):83–89. doi:[10.1002/\(SICI\)1098-108X\(200001\)27:1<83::AID-EAT9>3.0.CO;2-J](https://doi.org/10.1002/(SICI)1098-108X(200001)27:1<83::AID-EAT9>3.0.CO;2-J)
  29. Miller M, Pumariega AJ (2001) Eating disorders: a historical and cross-cultural review. *Psychiatry* 64:93–110. doi:[10.1521/psyc.64.2.93.18621](https://doi.org/10.1521/psyc.64.2.93.18621)
  30. Mussap AJ (2009) Acculturation, body image and eating behaviours in Muslim-Australian women. *Health Place* 15(2): 532–539. doi:[10.1016/j.healthplace.2008.08.008](https://doi.org/10.1016/j.healthplace.2008.08.008)
  31. Pavlova B, Uher R, Papezova H (2008) It would not have happened to me at home: qualitative exploration of sojourns abroad and eating disorders in young Czech women. *Eur Eat Disord Rev* 16:207–214. doi:[10.1002/erv.819](https://doi.org/10.1002/erv.819)
  32. Perez M, Voelz ZR, Pettit JM, Joiner Jr TE (2002) The role of acculturative stress and body dissatisfaction in predicting bulimic symptomatology across ethnic groups. *Int J Eat Disord* 31(4): 442–454. doi:[10.1002/eat.10006](https://doi.org/10.1002/eat.10006)
  33. Sánchez-Johnsen LAP, Hogan K, Wilkens LR, Fitzgibbon ML (2008) Correlates of problematic eating behaviours in less acculturated Latins. *Eat Behav* 9:181–189. doi:[10.1016/j.eatbeh.2007.07.008](https://doi.org/10.1016/j.eatbeh.2007.07.008)
  34. Soh NL, Touyz S, Dobbins T, Surgenor LJ, Clarke S, Cohn MR, Walter G (2007) Restraint and eating concern in North European and East Asian women with and without eating disorders in Australia and Singapore. *Aust N Z J Psychiatry* 41:536. doi:[10.1080/00048670701332318](https://doi.org/10.1080/00048670701332318)

35. Sussman M, Truong N, Lim J (2007) Who experiences “America the beautiful”? ethnicity moderating the effect of acculturation on body image and risks for eating disorders among immigrant women. *Int J Intercult Relat* 31:29–49. doi:[10.1016/j.ijintrel.2006.03.003](https://doi.org/10.1016/j.ijintrel.2006.03.003)
36. Tsai G, Curbow B, Heinberg L (2003) Sociocultural and developmental influences on body dissatisfaction and disordered eating attitudes and behaviours of asian women. *J Nerv Ment Dis* 191(5):309–318
37. Wildes JE, Emery RE (2001) The roles of ethnicity and culture in the development of eating disturbance and body dissatisfaction: a meta-analytic review. *Clin Psychol Rev* 21:521–551. doi:[10.1016/S0272-7358\(99\)00071-9](https://doi.org/10.1016/S0272-7358(99)00071-9)
38. Yamamiya Y, Shroff H, Thompson JK (2008) The tripartite influence model of body image and eating disturbance: a replication with a Japanese sample. *Int J Eat Disord* 41:88–91. doi:[10.1002/eat.20444](https://doi.org/10.1002/eat.20444)