






# Family-based weight stigma and psychosocial health: A multinational comparison

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## Abstract

**Objective:** Family-based weight stigma can be expressed as criticism, judgment, teasing, and mistreatment by family members because of an individual's body weight. The current study compared the prevalence and psychosocial correlates of family-based weight stigma among adult members of a weight-management program living in Australia, Canada, France, Germany, the UK, and the US.

**Methods:** Participants ( $N = 8100$  adults who reported having ever experienced weight stigma; 95% female; 94% White) completed an identical online survey in their country's dominant language that assessed their experiences of weight stigma from 16 different family member sources, as well as internalized weight bias, body image, eating behaviors, perceived stress, and self-rated health.

**Results:** Family-based weight stigma, especially from mothers (49%-62%), spouses/romantic partners (40%-57%), and fathers (35%-48%), was highly prevalent across countries. Weight stigma from one's immediate family members was associated with indices of poorer psychosocial health across the six countries ( $\beta$  coefficients =  $|0.08-0.13|$ ).

**Conclusions:** Findings highlight the need for weight stigma-reduction efforts to help family members distinguish between supportive, encouraging discourse and potentially weight-stigmatizing communication. Future research should examine the prevalence and correlates of family-based weight stigma in more diverse community samples, including among racially/ethnically and gender diverse adults, and in non-Western countries.

## INTRODUCTION

Weight stigma, the social devaluation of individuals with higher body weight, is present worldwide [1, 2]. Family members are common sources of weight stigma in the United States (US) [3, 4], and experiences of family-based weight stigma have been linked to adverse health consequences [3, 5-7]. Family-based weight stigma can occur as stereotyping, teasing, name-calling, criticism, rejection, or hostile treatment [8, 9]. Approximately one-third of youth (14%-38%) [5, 10-

12] and adults [13, 14] in community samples (primarily in the US) report experiencing weight teasing or hurtful weight comments from family members. Individuals with high body weight and those engaged in weight-management programs—potentially overlapping characteristics—report high rates of family-based weight stigma [4, 7, 15-17], with as many as 72% of adults with high weight reporting experiences of weight stigma from family members [4]. For adults engaged in weight management, family-based weight stigma may be particularly salient, especially given prior research documenting higher levels of internalized

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weight bias among adults trying to lose weight [18], and longitudinal evidence that family-based weight stigma predicts increased dieting [11].

Cross-sectional research in the US has identified adverse health correlates of family-based weight stigma, including unhealthy and extreme weight-control behaviors, binge eating, body dissatisfaction, depressive symptoms, poor self-esteem, and weight-bias internalization (WBI) among youth and adults [3, 5–7]. Longitudinal evidence from the US-based Project Eating and Activity over Time (EAT) cohort study highlights the enduring consequences of family-based weight stigma experienced in adolescence, which predicts more body dissatisfaction, eating to cope, weight gain, and unhealthy weight-control behaviors in adulthood [11, 12].

Despite mounting evidence that family-based weight stigma is harmful, several key gaps in knowledge persist. A common limitation of existing studies is grouping family members together, asking participants about their experiences with weight stigma from “family members” in general [3, 5, 14, 19], or collapsing family members into large groups (e.g., “extended family members”) [7, 15]. Approaches that collapse family member sources into groups may obscure key differences in manifestation and consequences of weight stigma across specific family member sources, as well as the potentially compounding effects of weight stigma from multiple distinct family member sources [13]. Weight stigma from family members may manifest differently and be differentially harmful depending on factors such as family member proximity, gender, and power dynamics (e.g., weight stigma from a mother vs. a male cousin). Indeed, in a recent qualitative study, US women engaged in weight management retrospectively described experiences with family-based weight stigma that varied in form, prevalence, and salience depending on the specific family member source of the stigma [20].

However, little quantitative work has examined the prevalence and impact of weight stigma from distinct family members, particularly from specific family members other than parents. Among the few studies that do examine the prevalence of weight stigma by specific family member sources, parents and romantic partners/spouses emerge as among the most common sources [4, 13, 20]. For instance, in a study of adults with overweight or obesity, 53% reported maternal weight stigma, 47% reported spousal weight stigma, and 44% reported paternal weight stigma [4]. Comparatively, weight stigma from daughters, sons, brothers, and sisters was less frequent (18%–37%), and participants did not report on their extended family members [4]. Improving understanding of the prevalence and health correlates of weight stigma enacted by specific family members, including extended family members, can inform family-based educational efforts to reduce harmful weight-related communication by identifying familial relationships that may be most imperative to target.

Additionally, most research on family-based weight stigma to date has been conducted in the US [7, 15]. However, contextual and cultural factors may influence the prevalence and consequences of family-based weight stigma across different countries. Factors that may affect experiences of weight stigma from different family members (e.g., proximity, power dynamics) may not be equivalent across cultural contexts. For example, extended family members (e.g., grandparents) take on different roles across cultural contexts [21, 21, 22]; findings from one study suggest that more grandparents

## Study Importance

### What is already known?

- Research, conducted primarily in the US, highlights the prevalence and health repercussions of family-based weight stigma for youth and adults. However, little is known about the prevalence and psychosocial health correlates of weight stigma from specific family member sources and how rates and correlates compare across countries.

### What does this study add?

- Findings from the current study indicate that family-based weight stigma, especially from mothers (49%–62%), spouses/romantic partners (40%–57%), and fathers (35%–48%), was highly prevalent in Australia, Canada, France, Germany, the UK, and the US.
- Weight stigma from immediate family members was associated with indices of poorer psychosocial health across the six countries ( $\beta$  coefficients = |0.08–0.13|).

### How might these results change the direction of research or the focus of clinical practice?

- Future cross-national examination of family-based weight stigma is warranted, as is further research to better understand the cultural mechanisms driving differences across countries. Future work should prioritize enumeration of specific family member sources, including those outside of one's immediate family, to learn more about the phenomenon of weight stigma in diverse family relationships.
- Weight-management programs should teach family members strategies to engage in supportive communication.

provide regular childcare in “pro-traditional” countries (e.g., Germany) than “pronatalist” countries (e.g., France) [22]. In cultures in which extended family members' roles are more prominent, weight stigma from these sources may be more common. Furthermore, cross-country variation has been documented with respect to sociocultural beliefs and attitudes that may be related to family-based weight stigma, including body-shape ideals [23], levels of weight bias [1], and WBI [24]. Levels of weight bias can vary even across Western, industrialized, and democratic countries, with more implicit weight bias reported in Germany and France than in the United Kingdom (UK) or the US, and more explicit weight bias in France than in Germany, the UK, or the US [1]. Given these cultural nuances, findings from studies of family-based weight stigma conducted in the US may be limited in their generalizability to other countries—even other Western countries. Accordingly, cross-national comparisons of the prevalence and consequences of weight stigma from specific family member sources

**TABLE 1** Demographic and anthropometric information, stratified by country

	Total analytic sample (N = 8100)			Australia (N = 698)			Canada (N = 1660)			France (N = 1396)			Germany (N = 1452)			UK (N = 1336)			US (N = 1558)			
	M	SD	%	M	SD	%	M	SD	%	M	SD	%	M	SD	%	M	SD	%	M	SD	%	
Age (y)	50.63	12.86		52.49 <sup>a</sup>	11.70		54.69 <sup>b</sup>	12.60		46.88 <sup>c</sup>	12.49		45.61 <sup>c</sup>	10.52		48.35 <sup>d</sup>	12.59		55.52 <sup>b</sup>	12.94		
BMI (kg/m <sup>2</sup> )	32.21	7.17		32.96 <sup>a</sup>	7.36		32.36 <sup>a</sup>	7.47		30.66 <sup>b</sup>	5.76		32.32 <sup>a</sup>	6.65		32.70 <sup>a</sup>	7.67		32.61 <sup>a</sup>	7.69		
Sex	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Female	7688	94.9	676 <sup>a</sup>	96.8	1549 <sup>b</sup>	93.3	1345 <sup>a</sup>	96.3	1391 <sup>a,b</sup>	95.8	1256 <sup>a,b</sup>	94.0	1471 <sup>a,b</sup>	94.4	1471 <sup>a,b</sup>	94.4	1278 <sup>a</sup>	95.7	1409 <sup>b</sup>	90.4	1471 <sup>a,b</sup>	94.4
Male	412	5.1	22	3.2	110	6.6	51	3.7	60	4.1	78	5.8	84	5.4	84	5.4	6	0.4	47	3.0	84	5.4
Other	7	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	1	0.1	3	0.2	2	0.1	3	0.2	3	0.2
Race/ethnicity <sup>1</sup>	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
NH White	4932	94.0	674 <sup>a</sup>	96.6	1571 <sup>a</sup>	94.6	1345 <sup>a</sup>	96.3	1391 <sup>a,b</sup>	95.8	1256 <sup>a,b</sup>	94.0	1471 <sup>a,b</sup>	94.4	1471 <sup>a,b</sup>	94.4	1278 <sup>a</sup>	95.7	1409 <sup>b</sup>	90.4	1471 <sup>a,b</sup>	94.4
NH Black	64	0.01	1	0.1	10	0.6	5	0.3	6	0.4	7	0.5	6	0.4	10	0.6	6	0.4	10	0.6	10	0.6
NH Asian	22	0.00	1	0.1	5	0.3	8	0.5	10	1.4	38	2.2	22	1.6	9	0.7	22	1.6	9	0.6	22	1.6
Hispanic/Latino	84	0.02	5	0.7	8	0.5	27	1.4	7	1.0	27	1.4	15	1.1	21	1.3	15	1.1	21	1.3	15	1.3
Other race/ethnicity	79	0.01	10	1.4	38	2.2	14	0.8	10	1.4	38	2.2	10	1.4	38	2.2	10	1.4	38	2.2	10	1.4
Mixed/multiple races/ethnicities	70	0.01	7	1.0	27	1.4	14	0.8	7	1.0	27	1.4	10	1.4	38	2.2	10	1.4	38	2.2	10	1.4
Sexual orientation <sup>1</sup>	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Heterosexual or straight	5038	95.9	676 <sup>a</sup>	98.3	1589 <sup>a</sup>	95.7	1345 <sup>a</sup>	96.3	1391 <sup>a,b</sup>	95.8	1256 <sup>a,b</sup>	94.0	1471 <sup>a,b</sup>	94.4	1471 <sup>a,b</sup>	94.4	1278 <sup>a</sup>	95.7	1409 <sup>b</sup>	90.4	1471 <sup>a,b</sup>	94.4
Gay or lesbian	95	1.8	10 <sup>a</sup>	1.4	33 <sup>a</sup>	2.0	5	0.3	6	0.4	7	0.5	6	0.4	10	0.6	6	0.4	10	0.6	10	0.6
Bisexual	84	1.6	7 <sup>a</sup>	1.0	28 <sup>a</sup>	1.7	8	0.5	10	1.4	38	2.2	22	1.6	9	0.7	22	1.6	9	0.6	22	1.6
Other	23	0.4	3 <sup>a</sup>	0.4	5 <sup>a</sup>	0.3	14	0.8	7	1.0	27	1.4	10	1.4	38	2.2	10	1.4	38	2.2	10	1.4
Relationship status <sup>2</sup>	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
In a relationship	6348	78.4	517 <sup>a</sup>	74.4	1293 <sup>a,b</sup>	78.1	1101 <sup>a,b</sup>	79.2	1167 <sup>b</sup>	80.5	1080 <sup>b,c</sup>	81.1	1190 <sup>a,b</sup>	76.7	1190 <sup>a,b</sup>	76.7	1284 <sup>a</sup>	96.1	1489 <sup>a</sup>	95.6	1489 <sup>a</sup>	95.6
Not in a relationship	1727	21.3	178	25.6	362	21.9	290	20.8	283	19.5	252	18.9	362	23.2	362	23.2	18 <sup>a</sup>	1.3	34 <sup>a</sup>	2.2	34 <sup>a</sup>	2.2
Level of education	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
College degree	4086	50.4	349 <sup>a,d</sup>	50.0	715 <sup>a</sup>	43.1	937 <sup>b</sup>	67.1	312 <sup>c</sup>	21.5	672 <sup>d</sup>	50.3	1101 <sup>b</sup>	70.7	1101 <sup>b</sup>	70.7	1284 <sup>a</sup>	96.1	1489 <sup>a</sup>	95.6	1489 <sup>a</sup>	95.6
No college degree	4014	49.6	349	50.0	945	56.9	459	32.9	1140	78.5	664	49.7	457	29.3	457	29.3	18 <sup>a</sup>	1.3	34 <sup>a</sup>	2.2	34 <sup>a</sup>	2.2

Note: Values within the same row not sharing the same letter are significantly different from each other at  $p \leq 0.001$ .

Abbreviations: M, mean; NH, non-Hispanic.

<sup>1</sup>Collection of data on race and sexual orientation was prohibited in France and Germany.

<sup>2</sup>Participants reported “yes” to being in a relationship if they had a significant other such as a partner, spouse, boyfriend, or girlfriend.

are warranted to advance our understanding of family-based weight stigma around the world and to inform collective initiatives to address weight stigma.

The current cross-national study examines the prevalence of weight stigma from specific family member sources, as well as health-related correlates of family-based weight stigma, among adults engaged in weight management who have ever experienced weight stigma or discrimination. This study builds upon recent analyses conducted with the same overall sample which document differences in prevalence and correlates of experienced and internalized weight stigma cross-nationally [2, 25, 26]. Given the prevalence of family-based weight stigma among individuals with high weight and adults engaged in weight management [4, 7, 16, 17], the current study aimed to assess the relative 1) prevalence of weight stigma from specific family member sources, and 2) associations among specific family member sources of weight stigma and different health correlates for adults who have ever experienced weight stigma or discrimination. As a secondary research aim, we tested the hypothesis that experiencing weight stigma from a greater number of family member sources would be associated with worse psychosocial health across the six countries.

## METHODS

### Participants and procedures

Participants were adult members of WeightWatchers (WW) in six countries (Australia, Canada, France, Germany, the UK, and the US) surveyed between May and July 2020 [2]. Participants were recruited from these six countries because each had a WW membership large enough to facilitate recruitment of at least 1000 eligible participants. Email invitations to an anonymous, voluntary, online Qualtrics survey, advertised as a “survey to learn more about people’s experiences related to body weight and health, including social experiences and challenges,” were sent to 1,752,756 randomly selected members of WW in these six countries. For participants in France and Germany, English surveys were translated into French or German, respectively, and back translated by a professional translation services company [27], and all surveys were piloted prior to data collection. Recruitment was simultaneous, with identical procedures across countries. Participants were not compensated for participation. Study procedures were approved by the University of Connecticut institutional review board.

Response rates were similarly low across the six countries (3.8%–5.9%). Of the 23,416 WW members who received a survey invitation, provided informed consent, and entered the survey, a total of 13,996 individuals met the broader study inclusion criteria (Australia:  $n = 1245$ ; Canada:  $n = 2708$ ; France:  $n = 2510$ ; Germany:  $n = 2613$ ; the UK:  $n = 2305$ ; and the US:  $n = 2615$ ). Additional details regarding study methods and demographic/anthropometric characteristics of participants in the final sample have been reported elsewhere [2, 25, 26].

The current study focuses on a subsample of 8100 participants (57.9% of the total sample) who responded “yes” to at least one of three yes/no questions assessing whether they had ever experienced

stigma, teasing, or discrimination because of their weight [7]. Only those participants who reported having experienced weight stigma, teasing, or discrimination were presented with survey items specific to family-based weight stigma. Participants in this analytic subsample were younger (mean  $[M]_{\text{age}} = 50.6$  years, standard deviation  $[SD] = 12.9$  vs.  $M_{\text{age}} = 54.4$  years,  $SD = 12.3$ ;  $t[13,968] = 17.6$ ,  $p < 0.001$ ), had higher body mass index (BMI;  $M_{\text{BMI}} = 32.2$ ,  $SD = 7.2$  vs.  $M_{\text{BMI}} = 28.2$ ,  $SD = 5.1$ ;  $t[13,994] = -37.0$ ,  $p < 0.001$ ), were less likely to be in a romantic relationship ( $\chi^2[1, N = 13,956] = 58.50$ ,  $p < 0.001$ ), and were more likely to have a college degree ( $\chi^2[1, N = 13,996] = 15.4$ ,  $p < 0.001$ ) than participants excluded from the analytic sample for having never experienced weight stigma, teasing, or discrimination. There were no sex differences between the two samples ( $\chi^2[1, N = 13,996] = 0.03$ ,  $p = 0.90$ ). Sample characteristics are provided in Table 1.

## Measures

### Demographic and anthropometric characteristics

Participants self-reported their age, sex assigned at birth, height and weight (used to tabulate BMI), education level, and relationship status. Most participants also reported their race and/or ethnicity (non-Hispanic [NH] White, NH Black, NH Asian, Hispanic/Latino, other race/ethnicity, and mixed/multiple races and/or ethnicities) and sexual orientation (heterosexual/straight, lesbian, gay, bisexual, or “other” sexual orientation).

### Interpersonal sources of weight stigma

Participants who reported ever experiencing weight stigma, teasing, or discrimination completed the Interpersonal Sources of Weight Stigma scale, a scale developed and tested in prior studies with adults engaged in weight management [4, 7]. Participants indicated how many times in their life they had experienced weight stigma, defined as “teasing, bullying, unfair treatment, or discrimination due to your body weight” from 16 different family sources, if applicable (e.g., spouse/romantic partner, brother, aunt; Table 2) on a 4-point scale (0 = “Never,” 1 = “Once in your life,” 2 = “More than once in your life,” 3 = “Multiple times”). Because this measure did not assess perceived severity of experiences of weight stigma, and given evidence that internalization of stigma can impact health independent of how much weight stigma is experienced [28], participants were dichotomized as either having ever (=1) or never (=0) experienced weight stigma from each family member.

### WBI

Participants’ WBI was measured using the 10-item Modified Weight Bias Internalization Scale (WBIS-M) [29], which assesses the extent to which individuals endorse and apply negative weight stereotypes to

**TABLE 2** Multinational comparisons of prevalence of family-based weight stigma experiences

	Total analytic sample (N = 8100), % (n)	Australia (N = 698), % (n)	Canada (N = 1660), % (n)	France (N = 1396), % (n)	Germany (N = 1452), % (n)	UK (N = 1336), % (n)	US (N = 1558), % (n)
Any family member	87.3 (7069)	91.0 (635) <sup>a,d</sup>	89.8 (1491) <sup>a,d</sup>	84.0 (1172) <sup>b,c</sup>	81.0 (1176) <sup>b</sup>	87.6 (1170) <sup>a,c</sup>	91.5 (1425) <sup>d</sup>
Mother	55.8 (4521)	60.0 (419) <sup>a,c</sup>	59.6 (990) <sup>a,c</sup>	49.1 (686) <sup>b</sup>	50.3 (731) <sup>b</sup>	54.6 (729) <sup>a,b</sup>	62.0 (966) <sup>c</sup>
Spouse/romantic partner	49.0 (3969)	56.7 (396) <sup>a</sup>	50.1 (831) <sup>a</sup>	44.1 (616) <sup>b</sup>	40.4 (587) <sup>b</sup>	54.6 (730) <sup>a</sup>	51.9 (809) <sup>a</sup>
Father	43.4 (3514)	47.9 (334) <sup>a</sup>	46.7 (776) <sup>a</sup>	35.1 (490) <sup>b</sup>	42.1 (612) <sup>a</sup>	42.2 (564) <sup>a</sup>	47.4 (738) <sup>a</sup>
Brother	31.0 (2507)	37.0 (258) <sup>a,d,e</sup>	36.3 (602) <sup>a,b</sup>	23.2 (324) <sup>c</sup>	23.3 (339) <sup>c</sup>	30.2 (403) <sup>d</sup>	37.3 (581) <sup>b,e</sup>
Aunt	30.3 (2451)	30.5 (213) <sup>a,d,e</sup>	32.5 (540) <sup>a,b</sup>	27.7 (386) <sup>a,d,e</sup>	31.7 (460) <sup>a,c</sup>	25.6 (342) <sup>d</sup>	32.7 (510) <sup>b,c,e</sup>
Grandmother	28.4 (2304)	27.7 (193) <sup>a,b</sup>	28.3 (469) <sup>a,b</sup>	25.4 (354) <sup>a</sup>	28.0 (406) <sup>a,b</sup>	28.8 (385) <sup>a,b</sup>	31.9 (497) <sup>b</sup>
Sister	28.2 (2286)	35.7 (249) <sup>a</sup>	32.3 (537) <sup>a</sup>	22.4 (313) <sup>b</sup>	24.0 (348) <sup>b</sup>	26.8 (358) <sup>b,c</sup>	30.9 (481) <sup>a,c</sup>
Mother-in-law	26.0 (2110)	26.6 (186) <sup>a</sup>	26.7 (444) <sup>a</sup>	26.4 (369) <sup>a</sup>	26.4 (384) <sup>a</sup>	25.0 (334) <sup>a</sup>	25.2 (393) <sup>a</sup>
Cousin	25.3 (2047)	26.6 (186) <sup>a,c,f</sup>	29.2 (485) <sup>a,b</sup>	22.8 (318) <sup>c,e</sup>	21.9 (318) <sup>c,d,e</sup>	19.1 (255) <sup>e</sup>	31.1 (485) <sup>b,f</sup>
Uncle	19.4 (1570)	18.9 (132) <sup>a,c,d</sup>	20.4 (338) <sup>a,b,c</sup>	17.8 (249) <sup>a,d,e</sup>	22.9 (332) <sup>c</sup>	15.0 (200) <sup>d</sup>	20.5 (319) <sup>b,c,e</sup>
Father-in-law	12.1 (983)	12.6 (88) <sup>a</sup>	13.6 (226) <sup>a</sup>	11.1 (155) <sup>a</sup>	12.8 (186) <sup>a</sup>	12.2 (163) <sup>a</sup>	10.6 (165) <sup>a</sup>
Grandfather	10.3 (832)	11.3 (79) <sup>a,b</sup>	10.1 (167) <sup>a,b</sup>	8.5 (119) <sup>a</sup>	10.3 (150) <sup>a,b</sup>	9.4 (125) <sup>a,b</sup>	12.3 (192) <sup>b</sup>
Son	9.9 (801)	14.5 (101) <sup>a</sup>	9.0 (150) <sup>b</sup>	9.7 (136) <sup>b</sup>	7.7 (112) <sup>b</sup>	11.2 (149) <sup>a,b</sup>	9.8 (153) <sup>b</sup>
Daughter	9.2 (747)	11.9 (83) <sup>a</sup>	9.2 (152) <sup>a,b</sup>	8.7 (121) <sup>a,b</sup>	7.0 (102) <sup>b</sup>	10.0 (134) <sup>a,b</sup>	9.9 (155) <sup>a,b</sup>

Note: Values within the same row not sharing the same letter are significantly different from each other at  $p \leq 0.001$ . Prevalences are among those who reported ever experiencing weight stigma/teasing/discrimination.

themselves and engage in self-devaluation because of their weight (e.g., “My weight is a major way that I judge my value as a person”) using a 7-point scale (1 = “Strongly disagree” to 7 = “Strongly agree”) [30, 31]. Higher scores indicate greater WBI ( $\alpha = 0.89$ -0.93; see Supporting Information Table S1 for means, SD, and Cronbach  $\alpha$  values overall and by country).

### Body image

Participants' body image was assessed using the “appearance evaluation” subscale of the Multidimensional Body-Self Relations Questionnaire [32]. This subscale includes seven items, such as “I like my looks just the way they are,” and uses a 5-point scale (1 = “Definitely disagree” to 5 = “Definitely agree”). Higher scores indicate better body image ( $\alpha = 0.82$ -0.86; Supporting Information Table S1).

### Eating to cope

Participants' eating to cope with life stress and/or negative affect was assessed using the “coping” subscale of the Motivations to Eat Scale [33]. Participants responded to five items regarding the frequency with which they eat in response to stress, negative affect, or boredom, such as “How often do you eat because you're depressed or sad?”, on a 6-point scale (0 = “Never” to 5 = “Always”). Higher scores indicate more frequent eating to cope ( $\alpha = 0.89$ -0.92; Supporting Information Table S1).

### Stress

Participants' stress was assessed using the Perceived Stress Scale 4 [34]. Participants responded to four items such as “In the last month how often have you felt difficulties were piling up so high that you could not overcome them?” on a 5-point scale (0 = “Never” to 4 = “Very often”). Higher scores indicate higher stress levels ( $\alpha = 0.76$ -0.81; Supporting Information Table S1).

### Health-related quality of life

Participants' mental health-related quality of life and physical health-related quality of life were assessed using the Short Form Health Survey (SF-12) [35]. This 12-item survey includes two component summary scales asking about participants' mental and physical health during the past 4 weeks [35]. The scales are tabulated and standardized based on population norms; scores are transformed to a 0 to 100 scale, in which 50 represents the population mean and higher scores indicate better health-related quality of life (Supporting Information Table S1) [35].

### Plan for analysis

Statistical analyses were conducted using SPSS Statistics version 27 (IBM Corp.) software. To reduce the chance of type I error given the large sample size, statistical significance was defined a priori at  $p \leq 0.001$  [36, 37]. Rates of missing data were  $\leq 1.5\%$  across all

**TABLE 3** Summary of multivariate linear regression models for family sources predicting psychosocial health

	Australia	Canada	France	Germany	UK	US
<b>Weight bias internalization</b>						
R <sup>2</sup>	0.24*	0.22*	0.13*	0.20*	0.23*	0.26*
ΔR <sup>2</sup>	0.03*	0.05*	0.03*	0.06*	0.03*	0.05*
Age	-0.16*	-0.13*	-0.15*	-0.17*	-0.18*	-0.17*
Current BMI	0.36*	0.33*	0.23*	0.32*	0.35*	0.33*
Sex (male)						
Female	0.06	0.05	0.05	0.03	0.08*	0.04
Relationship status (not in a relationship)						
In a relationship	-0.03	-0.10*	-0.10*	0.03	-0.01	-0.06
Spouse/partner	0.10	0.12*	0.02	0.11*	0.05	0.07
Mother	0.05	0.10*	0.05	0.07	0.06	0.06
Son	0.02	0.05	0.01	0.05	0.04	0.08*
In-laws	0.08	0.06	0.10*	0.04	0.01	0.07
<b>Body image</b>						
R <sup>2</sup>	0.29*	0.23*	0.15*	0.23*	0.21*	0.25*
ΔR <sup>2</sup>	0.02	0.02*	0.01	0.03*	0.02*	0.02*
Age		0.03		0.10*	0.13*	0.08*
Current BMI		-0.43*		-0.43*	-0.40*	-0.43*
Spouse/partner		-0.08*		-0.11*	-0.05	0.04
Son		-0.05		-0.03	-0.06	-0.09*
<b>Eating to cope</b>						
R <sup>2</sup>	0.16*	0.12*	0.08*	0.13*	0.14*	0.13*
ΔR <sup>2</sup>	0.06*	0.03*	0.02	0.05*	0.03*	0.04*
Age	-0.09	-0.09*		-0.04	-0.14*	-0.10*
Current BMI	0.24*	0.21*		0.22*	0.22*	0.20*
Sex (male)						
Female	0.08	0.11*		0.10*	0.11*	0.04
Spouse/partner	0.13*	0.12*		0.09*	0.08	0.06
Mother	0.02	0.10*		0.11*	0.05	0.04
<b>Mental health-related quality of life</b>						
R <sup>2</sup>	0.16*	0.14*	0.06*	0.07*	0.11*	0.15*
ΔR <sup>2</sup>	0.06*	0.04*	0.02	0.04*	0.04*	0.04*
Age	0.25*	0.26*		0.15*	0.19*	0.27*
Current BMI	-0.08	-0.05		0.03	-0.10*	-0.08
Sex (male)						
Female	-0.05	-0.08*		-0.05	-0.05	-0.01
Spouse/partner	-0.10	-0.11*		-0.09	-0.12*	-0.06
Mother	0.00	-0.11*		-0.03	-0.06	-0.11*
<b>Stress</b>						
R <sup>2</sup>	0.13*	0.12*	0.06*	0.08*	0.10*	0.12*
ΔR <sup>2</sup>	0.06*	0.03*	0.02*	0.03*	0.03*	0.05*
Age	-0.17*	-0.24*	-0.13*	-0.18*	-0.16*	-0.19*
Current BMI	0.13*	0.08*	0.12*	0.13*	0.11*	0.08
Sex (male)						
Female	0.05	0.10*	0.00	0.06	0.08	-0.03
Spouse/partner	0.14*	0.11*	0.05	0.09*	0.08	0.06

(Continues)



**TABLE 3** (Continued)

	Australia	Canada	France	Germany	UK	US
Physical health-related quality of life						
$R^2$	0.20*	0.21*	0.14*	0.26*	0.19*	0.16*
$\Delta R^2$	0.01	0.03*	0.00	0.02	0.02	0.01
Age		-0.24*				
Current BMI		-0.35*				
Education (no college degree)						
College degree		0.10*				
Brother		-0.10*				

Note: Values are standardized betas from second (and final) step of hierarchical linear regressions, if second step was significant at  $p \leq 0.001$ . If step two was nonsignificant, coefficients are not reported. Only variables significant in at least one country are included.

\* $p \leq 0.001$ .

variables (except the SF-12, for which the rate of missingness was 10.9%). First, bivariate correlations were conducted overall and by country to assess associations among covariates (age, sex, education, relationship status, BMI) and key variables of interest (family member sources of weight stigma, WBI, body image, eating to cope, stress, and health-related quality of life). Second,  $\chi^2$  analyses and post hoc between-country comparisons were conducted to compare the prevalence of specific family member sources of weight stigma across the six countries.

Third, to assess associations among specific family member sources of weight stigma and psychosocial health, five additional hierarchical linear regressions, one for each outcome variable of interest, were conducted for each country. Three groups of family sources were highly correlated with one another (all  $p < 0.001$ ): 1) mother-in-law and father-in-law ( $r = 0.78$ ); 2) grandmother and grandfather ( $r = 0.64$ ); and 3) aunt, uncle, and cousin (aunt and uncle:  $r = 0.76$ ; aunt and cousin:  $r = 0.70$ ; uncle and cousin:  $r = 0.65$ ). These family sources were collapsed to form three groups: parent-in-law; grandparent; and aunt/uncle/cousin. Thus, family member sources were entered into regression analyses in 10 groups: spouse/romantic partner; mother/stepmother; father/stepfather; parent-in-law; sister; brother; daughter; son; grandparent; and aunt/uncle/cousin. In each regression, step one contained covariates, and step two contained 10 family member sources of weight stigma. Finally, to assess whether experiencing weight stigma from a greater number of family member sources was associated with worse psychosocial health, five hierarchical linear regressions, one for each outcome variable of interest, were conducted for each of the six countries with covariates entered in step one and number of family member sources of weight stigma reported as a continuous predictor in step two. Continuous variables were mean-centered within countries. Variance inflation factors for family member sources were all less than 1.5.

## RESULTS

Among those participants who reported having ever experienced weight stigma, at least 81% reported experiencing weight stigma from family members (Table 2). The most common family member sources

of stigma reported across countries were mothers (49.1%-62.0%), spouses/romantic partners (40.4%-56.7%), and fathers (35.1%-47.9%). More than a quarter of the analytic sample reported weight stigma from female extended family members (e.g., aunts: 25.6%-32.7%). Rates of weight stigma across family member sources were generally lowest in France or Germany.

### Health-related correlates of specific family sources of weight stigma

Table 3 summarizes health-related correlates of specific family sources of weight stigma. Standardized  $\beta$  coefficients are the value by which the SD of the dependent variable increases with every one-unit SD increase in the independent variable; values below 0.10 are considered very small and they should be interpreted with caution [38]. Weight stigma from spouses/romantic partners was associated with higher WBI among participants in Canada ( $\beta = 0.12$ ,  $p \leq 0.001$ ) and Germany ( $\beta = 0.11$ ,  $p \leq 0.001$ ), but not other countries. Weight stigma from mothers and sons was linked to WBI only among participants in Canada ( $\beta = 0.10$ ,  $p \leq 0.001$ ) and the US ( $\beta = 0.08$ ,  $p \leq 0.001$ ), respectively. Weight stigma from parents-in-law was positively associated with WBI among participants in France ( $\beta = 0.10$ ,  $p \leq 0.001$ ), but not other countries.

With respect to body image, weight stigma from spouses/romantic partners was associated with worse body image among participants in Canada ( $\beta = -0.08$ ,  $p \leq 0.001$ ) and Germany ( $\beta = -0.11$ ,  $p \leq 0.001$ ). Among US participants (but not other countries), weight stigma from sons was associated with worse body image ( $\beta = -0.09$ ,  $p \leq 0.001$ ). Eating to cope with stress/negative affect was more prevalent among participants who reported weight stigma from spouses/romantic partners and mothers. Weight stigma from spouses/romantic partners was positively associated with eating to cope for participants in Australia ( $\beta = 0.13$ ,  $p \leq 0.001$ ), Canada ( $\beta = 0.12$ ,  $p \leq 0.001$ ), and Germany ( $\beta = 0.09$ ,  $p \leq 0.001$ ), but not in France, the UK, or the US. Similarly, weight stigma from mothers was positively associated with eating to cope only in Canada ( $\beta = 0.10$ ,  $p \leq 0.001$ )

**TABLE 4** Summary of multivariate linear regression models for number of family sources of weight stigma variable predicting psychosocial health

	Australia	Canada	France	Germany	UK	US
<b>Weight bias internalization</b>						
$R^2$	0.23*	0.21*	0.11*	0.20*	0.23*	0.25*
$\Delta R^2$	0.02*	0.03*	0.02*	0.05*	0.03*	0.04*
Age	-0.14*	-0.10*	-0.14*	-0.15*	-0.17*	-0.16*
Current BMI	0.35*	0.32*	0.25*	0.32*	0.34*	0.33*
Sex (male)						
Female					0.09*	
Relationship status (not in a relationship)						
In a relationship			-0.09*			
Number of family sources	0.15*	0.19*	0.12*	0.23*	0.17*	0.21*
<b>Body image</b>						
$R^2$	0.27*	0.21*	0.14*	0.21*	0.21*	0.24*
$\Delta R^2$	0.00	0.01*	0.00	0.02*	0.01*	0.01*
Age					0.11*	
Current BMI		-0.42*		-0.42*	-0.39*	-0.43*
Number of family sources		-0.09*		-0.13*	-0.12*	-0.11*
<b>Eating to cope</b>						
$R^2$	0.14*	0.10*	0.08*	0.13*	0.14*	0.12*
$\Delta R^2$	0.04*	0.02*	0.01*	0.05*	0.03*	0.03*
Age		-0.08*	-0.14*		-0.13*	-0.10*
Current BMI	0.22*	0.20*	0.14*	0.22*	0.21*	0.20*
Sex (male)						
Female		0.11*	0.13*	0.11*	0.11*	
Number of family sources	0.21*	0.14*	0.12*	0.22*	0.16*	0.19*
<b>Mental health-related quality of life</b>						
$R^2$	0.15*	0.12*	0.05*	0.06*	0.11*	0.14*
$\Delta R^2$	0.03*	0.02*	0.01*	0.03*	0.03*	0.03*
Age	0.24*	0.25*	0.13*	0.13*	0.18*	0.26*
Current BMI			-0.09*		-0.09*	
Sex (male)						
Female		-0.08*				
Number of family sources	-0.19*	-0.13*	-0.12*	-0.18*	-0.18*	-0.17*
<b>Stress</b>						
$R^2$	0.11*	0.11*	0.05*	0.07*	0.09*	0.12*
$\Delta R^2$	0.04*	0.02*	0.02*	0.02*	0.02*	0.04*
Age	-0.13*	-0.22*	-0.12*	-0.16*	-0.14*	-0.19*
Current BMI			0.12*	0.13*	0.10*	0.08*
Sex (male)						
Female		0.10*			0.08*	
Relationship status (not in a relationship)						
In a relationship					-0.09*	
Number of family sources	0.20*	0.14*	0.13*	0.14*	0.15*	0.21*
<b>Physical health-related quality of life</b>						
$R^2$	0.20*	0.20*	0.14*	0.26*	0.18*	0.16*

(Continues)



TABLE 4 (Continued)

	Australia	Canada	France	Germany	UK	US
$\Delta R^2$	0.00	0.01*	0.00	0.01*	0.01*	0.00
Age		-0.30*		-0.23*	-0.26*	
Current BMI		-0.35*		-0.43*	-0.32*	
Education (no college degree)						
College degree		0.10*				
Number of family sources		-0.11*		-0.10*	-0.09*	

Note: Values are standardized betas from second (and final) step of hierarchical linear regressions, if second step was significant at  $p \leq 0.001$ . If step two was nonsignificant, coefficients are not reported. Only variables significant in at least one country are included.

\* $p \leq 0.001$ .

and Germany ( $\beta = 0.11$ ,  $p \leq 0.001$ ). For general perceived stress, weight stigma from spouses/romantic partners (but no other family sources) was associated with higher stress among participants in Australia ( $\beta = 0.14$ ,  $p \leq 0.001$ ), Canada ( $\beta = 0.11$ ,  $p \leq 0.001$ ), and Germany ( $\beta = 0.09$ ,  $p \leq 0.001$ ).

Weight stigma from two family sources was associated with worse mental health-related quality of life. Weight stigma from spouses/romantic partners was associated with worse mental health-related quality of life among participants in Canada ( $\beta = -0.11$ ,  $p \leq 0.001$ ) and the UK ( $\beta = -0.12$ ,  $p \leq 0.001$ ). Weight stigma from mothers was also associated with poorer mental health-related quality of life only in Canada ( $\beta = -0.11$ ,  $p \leq 0.001$ ) and the US ( $\beta = -0.11$ ,  $p \leq 0.001$ ).

With respect to physical health-related quality of life, no family sources of weight stigma were associated with physical health-related quality of life, with the exception that Canadian participants who experienced weight stigma from brothers had significantly worse physical health-related quality of life ( $\beta = -0.10$ ,  $p \leq 0.001$ ) than their counterparts who did not experience weight stigma from brothers.

### Number of family member sources of weight stigma and psychosocial health

Table 4 summarizes health-related correlates of the number of family member sources of weight stigma. Experiencing weight stigma from a greater number of family member sources was associated with higher WBI ( $\beta$  coefficients = 0.12 to 0.23,  $p$  values  $\leq 0.001$ ), more eating to cope ( $\beta$  coefficients = 0.12 to 0.22,  $p$  values  $\leq 0.001$ ), worse mental health-related quality of life ( $\beta$  coefficients = -0.12 to 0.19,  $p$  values  $\leq 0.001$ ), and more stress ( $\beta$  coefficients = 0.13 to 0.21,  $p$  values  $\leq 0.001$ ) in all six countries and worse body image ( $\beta$  coefficients = -0.09 to -0.13,  $p$  values  $\leq 0.001$ ) and physical health-related quality of life ( $\beta$  coefficients = -0.09 to -0.11,  $p$  values  $\leq 0.001$ ) in at least three countries.

## DISCUSSION

This study is the first, to our knowledge, to compare the prevalence and psychosocial/health correlates of family-based weight stigma in a

multinational context. Family-based weight stigma was prevalent among those who reported a history of experiencing weight stigma, ranging from 81% in Germany to 92% in the US. Consistent with previous research with adults with high weight in the US [4] and Australia [13], mothers and spouses/romantic partners were the most common sources of weight stigma across the six countries, although most family member sources, including extended family members, were reported by at least one-quarter of participants in each country.

### Prevalence of weight stigma by extended family members

A recent US study provided preliminary evidence that extended family members may be common sources of weight stigma [7]. However, the current study is the first, to our knowledge, to quantitatively demonstrate which extended family members are more prevalent sources of weight stigma, and whether this differs across countries, using a sample of adults with a history of experiencing weight stigma. Weight stigma from female extended family members (namely aunts, grandmothers, and mothers-in-law) was especially common across countries, which may be indicative of shared social norms regarding the acceptability of weight talk among women in these Western countries. Indeed, numerous studies have documented the high prevalence of “fat talk” (i.e., informal negative conversations about body size/shape) among women [39] and, in the context of families, maternal weight comments are more prevalent than paternal weight comments [3, 10, 40]. Future cross-cultural work should examine the norms and mechanisms that underlie gender patterns in prevalence of weight stigma from extended family members.

### Health implications of weight stigma from immediate family members and multiple family members

Weight stigma from participants' immediate families, specifically spouses/romantic partners, mothers, brothers, and sons, was associated with at least one poor psychosocial health indicator in each country, except for France. Specifically, in Australia, Canada,

Germany, the UK, and the US, weight stigma from one's immediate (vs. extended) family was associated with the greatest number of poor psychosocial health indices. These findings extend previous qualitative evidence that has suggested that adults' worst experiences of weight stigma occur at home [41]. It is unclear why, despite having a similar prevalence of family-based weight stigma to the other five countries, France was an exception. Future cross-cultural research should assess participants' perceptions of the severity or distress of their experiences of weight stigma to see whether these are differentially perceived in different cultural contexts.

In Canada, Australia, Germany, and the UK, weight stigma by spouses/romantic partners was consistently linked to poor health and well-being and associated with the greatest number of poor psychosocial/health indices (although, for 3 of these 12 significant associations, effect sizes were  $<0.10$ ). This is unsurprising given that spouses/romantic partners may be among the most proximal and salient family members in these middle-aged adults' lives. Because most study participants were heterosexual women in relationships, these findings highlight the need for weight stigma-reduction efforts to target men in romantic relationships. Targeted social norming interventions in these countries may help reduce weight bias expressed by men and promote more supportive, health-focused conversations in relationships. It is less clear why weight stigma from spouses/romantic partners, despite being prevalent, was not associated with poor health and well-being among participants in France and the US. Qualitative research may elucidate why weight stigma from specific family members is differentially harmful across cultural contexts.

Weight stigma from mothers was associated with negative psychosocial health in Canada, Germany, and the US. These findings suggest that, for some, weight stigma from one's family of origin remains salient and associated with poor psychosocial health even in middle adulthood when these family members may be less proximal. However, the developmental stage during which individuals experience weight stigma (e.g., childhood vs. adulthood) may be an important factor and was not assessed in the current study. Future longitudinal research should examine the timing and frequency of family-based weight stigma to ascertain whether adults who are negatively impacted by weight stigma from their families of origin are experiencing residual consequences from weight stigma endured in childhood, adulthood, or recurrent stigma across the life course; the differential consequences of maternal weight stigma may reflect the recency of these stigmatizing experiences.

That weight stigma from a greater number of family member sources was associated with worse psychosocial health speaks to the need for intervention and prevention programming to combat weight-stigmatizing communication in families. Future research should further investigate the potentially compounding effects of weight stigma from multiple family member sources. For example, research is needed to parse the consequences of *frequency* of family-based weight stigma [42] from *number of sources* of family-based weight stigma. In families in which weight-stigmatizing communication is more normative, individuals may not only experience weight stigma from a greater number of family sources, but also weight stigma at a higher frequency.

Together, these findings highlight the commonality of family-based weight stigma, particularly from members of one's immediate family, and its associations with health and well-being among adults in six countries with a history of experiencing weight stigma. To prevent or mitigate potential consequences of family-based weight stigma for adults, weight-management and weight-stigma intervention programs should address the roles of family members, especially spouses/romantic partners and mothers, and help educate family members with strategies to engage in supportive communication with loved ones.

## Limitations and future directions

Despite this study's strengths (e.g., large, multinational sample), findings should be interpreted considering several limitations. First, these data reflect self-reported, cross-sectional recollections of family-based weight stigma. Second, this study focused on family-based weight stigma among adult members of a weight-management program who reported a history of experiencing weight stigma. Future research should examine the prevalence and consequences of family-based weight stigma among community samples of adults and in African, Asian, and South American countries, as our findings may not generalize to adults who are not engaging in a structured weight-management program or who are living in non-Western countries. Relatedly, participants in the current study were predominantly White, heterosexual women. Future international research should examine family-based weight stigma among more diverse samples to better understand the manifestations and consequences of these experiences among individuals with different identities, social positions, and experiences.

Third, the survey response rate was low and may be subject to response bias; participants for whom body weight was especially salient, or who had previously experienced weight stigma, may have been more likely to participate. Fourth, although using a conservative  $p$  value of  $\leq 0.001$  reduces the chance of type I error, it does increase the chance of type II error. Fifth, experiences of family-based weight stigma were dichotomized; future research should assess whether and how the amount and perceived severity of experiences of weight stigma are related to psychosocial health. Finally, these data were collected during the early months of the COVID-19 pandemic, and it is unclear whether pandemic-related contextual factors influenced participants' responses.

## CONCLUSION

Our findings demonstrate the ubiquity and psychosocial health correlates of weight stigma from diverse family member sources in Australia, Canada, France, Germany, the UK, and the US. Although there were more similarities than differences in family-based weight stigma across the six countries, some cross-national differences in both prevalence and psychosocial health correlates of family-based

weight stigma emerged. Future cross-national examination of family-based weight stigma is warranted, as is research to better understand the cultural mechanisms driving differences across countries. Future work should prioritize enumeration of specific family member sources, including those outside of one's immediate family, to learn more about the phenomenon of weight stigma in diverse family relationships. **O**

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## CONFLICT OF INTEREST STATEMENT

Rebecca M. Puhl was previously a consultant to WW International, Inc. Gary D. Foster is an employee and shareholder of WW International. The other authors declared no conflict of interest.

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#### SUPPORTING INFORMATION

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

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