

ORIGINAL ARTICLE

Body image and weight control in young adults: international comparisons in university students from 22 countries

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Objective: Young women in the United States and Western Europe are notoriously concerned about weight but less is known about attitudes to weight in other regions of the world. This study explores the associations between body mass index (BMI), weight perceptions, and attempts to lose weight in male and female university students from 22 countries.

Methods: Data were collected from 18 512 university students, using standardised methods, as part of the International Health Behaviour Survey. Measures included weight, height, perception of overweight, and weight loss status. BMI was calculated from weight and height, but was categorised into gender and country-standardised deciles rather than the conventional weight categories in response to the inaccuracy of self-reports. Perceived overweight and weight loss status were plotted against country-standardised BMI deciles. The 22 countries were grouped into five geopolitical/economic areas for regional analyses: North-Western Europe and the USA, Central and Eastern Europe, the Mediterranean, Pacific Asia, South America. Perceived overweight compared across the five regions.

Results: Perceived overweight increased systematically across BMI deciles in all countries. More women than men felt overweight at any decile. Women had low levels of perceived overweight in the lowest decile but rates rapidly increased to 50% by the 5th decile. Men, even in the highest deciles, were less aware that they are overweight and few of them were trying to lose weight. Women had a faster rise of weight loss attempts over the BMI deciles but nevertheless the proportion trying to lose in the highest decile did not exceed 75%. Perceived overweight profiles across BMI deciles were similar across all regions, suggesting that perceptions of overweight derive from local comparisons. The patterning for trying to lose weight was more diverse, with men and women from Asian countries showing higher levels of trying to lose weight at all deciles.

Conclusions: This study shows the international consistency in perceptions of overweight in educated young men and women across diverse regions of the world. It confirms the patterning of women's overestimation of weight at lower BMI deciles and men's underestimation of weight at the higher deciles. Perceptions of overweight and attempts to lose weight were highest in the group of Asian countries where body weights are generally low, suggesting that local culture and norms could moderate attitudes to weight.

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Introduction

The prevalence of obesity has been increasing progressively in the past two decades across most of the world.^{1,2} Average body mass index (BMI) in industrialised countries has climbed steadily and in many countries overweight is the

new 'normal' weight.³ There is widespread agreement that the causes of the obesity 'epidemic' lie in the combination of an environment which is increasingly facilitative of a positive energy balance (diminished need for physical activity; an increasingly cheap and energy-dense food supply) and a susceptible genotype.^{4,5} Reversing, or even stabilising, the obesity rise is likely to require dramatic changes in the environment. Experience in the smoking field shows that policies to promote environmental change are critical,⁶ but consolidating public and industrial support is a slow process. In the meantime, individual-level factors could play a part if people have the appropriate knowledge, resources, opportunities and support, to create less 'obeso-

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genic' microenvironments for themselves, within which healthier diet and activity patterns could forestall a positive energy balance.

In the light of the increases in population weights, we believe that it is worthwhile revisiting the issue of perceptions and actions around weight and weight control. Historically, perceived overweight and the drive for weight control have often been characterised as irrational and hazardous, especially for young women, who are viewed as pursuing absurdly thin ideal weights and risking their physical and mental health.⁷⁻⁹ However, when the accuracy of perceptions of overweight is investigated more closely, it appears that the problem is not just that some thin people feel fat,¹⁰ but also that many overweight people are unaware that their body weight is too high.¹¹⁻¹³ In a population-based survey in the UK, fewer than half of the overweight men identified themselves as overweight, and although women were more accurate in their weight perceptions, those whose BMI was just over 25 kg/m² were almost as likely to rate themselves as 'about right' as 'slightly overweight'.¹¹ In this study, heights and weights were self-reported, which underestimates BMI; with measured BMI the 'under-recognition' of overweight might have been even more pronounced. One possible reason for the under-recognition of overweight is the increasing prevalence of high weights, which could shift perceptions of what is normal. If this were so, overweight people from countries where weights are generally high (e.g. America) might be expected to be less aware of the problem than those in 'slimmer' populations (e.g. Japan).

Recognising overweight is one step on the way to implementing changes in diet and physical activity; the next stage is trying to lose weight. Among an overweight British population, only 48% said that they were trying to lose weight, although this was higher among those who recognised themselves as 'overweight' (57%) than those who claimed that they were 'about right' (9%).¹¹ The results suggested that a considerable proportion of individuals fail to engage in healthy weight control when it is necessary. Failure to recognise overweight may perpetuate a false sense of security around health and contribute to persistence of unhealthy lifestyles.

It would appear to be timely to investigate public awareness of overweight. Young adults are a particularly significant group in relation both to overweight and underweight. In early adulthood, obesity is still comparatively uncommon, so if those whose weight places them at risk (i.e. BMI over 25 kg/m²) were aware of the problem, they might be able to forestall the otherwise almost inexorable progression to obesity. At the same time, adolescence and young adulthood are key risk times for body image problems and eating disorders. Many young women are slim, and for them, perceiving themselves as overweight or trying to lose weight would be entirely inappropriate. This means that investigations of perceptions of weight and weight loss attempts need to ascertain the balance of over- and under-perception of overweight.

An international perspective on weight control is important in the light of the status of obesity as a global problem. This study examines weight perceptions and weight loss behaviour among university students from 22 countries, who took part in the International Health Behaviour Survey (IHBS).

Methods

The International Health and Behaviour Survey (IHBS) is a self-report questionnaire study of a wide range of health behaviours and health beliefs among university students from 23 countries, carried out between 1999 and 2001. The questionnaire items for the IHBS were deliberately selected to be simple and were translated and back-translated into 17 languages (Bulgarian, Dutch, Flemish, French, German, Greek, Hungarian, Icelandic, Italian, Japanese, Korean, Polish, Portuguese, Romanian, Slovakian, Spanish and Thai). Questionnaire items were based on the forerunner of the IHBS, the European Health Behaviour Survey (EHBS), which was a very similar survey carried out in Europe between 1989 and 1991.^{14,15} Reliability and validity of the measures have been described in earlier studies.¹⁶ Since the present study is concerned specifically with the aspects of weight perception and weight control, only items related to trying to lose weight, weight perceptions, BMI, gender and age are described. Results from South Africa are not included in these analyses because of missing data on weight.

The international perspective permits both crosscultural comparisons and examination of the predictors of health behaviours in diverse cultural contexts. Groups of countries (regions) were defined by cultural, geographical and political criteria. Five groupings were created: (1) North-Western Europe and the USA (Belgium, England, France, Germany, Iceland, Ireland, the Netherlands, and the USA); (2) the former socialist states of Central and Eastern Europe (Bulgaria, Hungary, Poland, Romania, and Slovakia); (3) Mediterranean countries (Greece, Italy, Portugal and Spain); (4) countries of the Pacific-Asian rim (Japan, Korea, and Thailand); and (5) South American countries (Colombia and Venezuela).

A network of established collaborators from universities in each of the 22 countries distributed the IHBS questionnaire to students enrolled in nonhealth related courses at the undergraduate level. Data collection was carried out at one university in each of 18 countries, and at two universities in the other four countries. Aiming for a common method of data collection, collaborators administered the questionnaire to students in any year of the undergraduate course, during a teaching session. Students were informed that the survey concerned activities related to health and an international comparison was being conducted but no further details were provided. Although completion of the questionnaire was voluntary, participation exceeded 90% in most countries.

A total of 18 512 university students (men, $n=8115$; women, $n=10397$), aged 17–30 years completed the IHBS questionnaire.

Measures

Weight and height were self-reported in the preferred metric. BMI was calculated using the formula: weight (kg)/height (m)².

Perceived weight was assessed by asking participants if they considered themselves to be 'very overweight', 'slightly overweight', 'about right', 'slightly underweight', or 'very underweight' as used in previous studies.¹¹ These were combined into 'perceived overweight', 'perceived normal weight', and 'perceived underweight' groups for some analyses.

Trying to lose weight was assessed with a single item 'Are you trying to lose weight?' with a 'yes/no' response format.

Statistical analyses

The statistical analyses compared BMI, perceived overweight and the frequency of trying to lose weight in men and women in each country sample, and across the five regions. To deal with the problem of under-reporting of weight, which could be variable across genders and countries, BMI was categorised into country-standardised deciles by gender for some of the analyses. Although still based on self-report, the adjustment of BMI by country-standardised deciles will

create a relative standard of comparison between countries. Age-adjusted prevalence of perceived weight and trying to lose weight were computed separately for men and women, with results presented as percentages or means with 95% confidence intervals. ANOVA and χ^2 analyses were used to investigate the relationship between weight perception, trying to lose weight and BMI deciles in men and women overall and across the five regions. Statistical analyses were carried out with SPSS 10.1.

Results

Self-reported heights and weights, and the derived BMI values are shown in Table 1. On the basis of their reported weights and heights, most men and women had BMI values that fell within the 'normal' range of 19–24.99 kg/m² (78.3% of men and 75.8% of women). A total of 4.8% of men and 18.1% of women gave reported weights and heights placing them in what is conventionally called the underweight range (BMI < 18.5 kg/m²), 15.0% of men and 5.1% of women were in the overweight range (≥ 25 kg/m²) and 2% of men and 1% of women reported BMIs in the obese range (≥ 30 kg/m²). This prevalence of overweight and obesity is well below expected values for this age group, especially for the women, even taking account of the high educational level of the respondents.

Table 1 Means and standard deviations of reported weight (kg) and height (cm) in men and women from 22 countries

	Men			Women			
	Weight	Height	BMI	Weight	Height	Height	BMI
Belgium	72.4 (9.4)	181.6 (6.6)	22.1	58.7 (7.4)	168.3 (6.1)		20.9
England	72.2 (11.0)	178.8 (7.6)	22.7	56.9 (9.0)	165.2 (6.9)		20.9
France	69.4 (9.7)	178.2 (6.6)	21.9	56.5 (8.7)	166.1 (6.4)		20.6
Germany	76.3 (10.3)	181.2 (7.5)	22.8	60.6 (8.7)	169.0 (6.2)		20.9
Iceland	77.3 (13.7)	179.4 (20.3)	23.6	60.1 (14.5)	167.8 (5.8)		22.1
Ireland	71.5 (11.4)	179.5 (6.8)	22.3	58.2 (7.5)	166.7 (6.4)		21.3
Netherlands	75.4 (9.8)	185.1 (7.5)	21.9	64.3 (8.1)	172.4 (6.3)		21.5
USA	78.2 (13.4)	179.8 (8.2)	24.3	61.0 (9.9)	165.1 (7.4)		22.6
Bulgaria	74.6 (10.6)	179.1 (7.0)	23.1	55.7 (7.9)	166.9 (5.5)		19.9
Hungary	73.0 (10.1)	180.5 (7.5)	22.1	58.0 (8.7)	167.5 (6.5)		20.4
Poland	75.0 (9.2)	180.7 (6.5)	22.8	56.6 (6.9)	167.4 (5.9)		20.1
Romania	70.8 (9.9)	178.1 (6.2)	22.3	54.4 (7.3)	164.3 (6.2)		20.0
Slovakia	75.7 (10.3)	180.7 (6.4)	23.0	58.5 (6.5)	168.9 (5.8)		20.4
Greece	77.1 (10.5)	180.8 (6.7)	23.4	58.4 (7.9)	167.3 (6.0)		20.8
Italy	70.4 (9.4)	178.4 (6.4)	22.2	54.9 (7.4)	165.8 (6.1)		20.0
Portugal	72.5 (10.9)	177.4 (6.6)	22.9	57.0 (8.5)	164.0 (6.4)		21.1
Spain	74.0 (9.4)	178.2 (6.4)	23.2	58.4 (8.3)	166.1 (5.9)		21.1
Japan	62.9 (9.5)	171.5 (5.9)	21.5	50.1 (6.3)	157.5 (5.4)		20.5
Korea	63.6 (8.4)	173.7 (5.7)	20.7	50.6 (5.0)	161.5 (4.7)		19.3
Thailand	60.4 (9.5)	171.9 (6.0)	20.5	49.5 (7.2)	159.6 (5.4)		19.6
Columbia	66.3 (9.0)	174.3 (6.5)	21.8	54.2 (6.7)	162.3 (5.6)		20.6
Venezuela	73.5 (11.1)	176.9 (7.1)	23.6	55.8 (7.4)	163.9 (6.3)		21.0

To estimate the accuracy of the self-reports, data from the English students were compared with measured weights and heights in similarly aged men and women (18–22 years) from nonmanual social backgrounds selected from the Health Survey for England (HSE) in 2001.¹⁷ HSE data showed that young men from nonmanual backgrounds were on average 178.4 cm tall, weighed 76.5 kg, and had a BMI of 24.0 kg/m²; with 23% overweight and 6% obese. Young women were 164.0 cm tall, weighed 64.1 kg, and had a BMI of 23.8 kg/m, with 19% overweight and 8% obese.¹⁷ These compare with men in the IHBS sample reporting a height of 178.8 cm, weight of 72.2 kg and BMI of 22.7 kg/m resulting in 13.9% being classified as overweight and 1.6% obese. The IHBS women reported a height of 165.2 cm, and a weight of 56.9 kg, giving them a BMI of 20.9 kg/m, and classifying 5.3% as overweight and 1.4% as obese. There is little doubt that the English students overestimated their heights and underestimated their weights, resulting in an underestimation of BMI, and a huge under-estimate of the proportion of the group who are overweight or obese. We have not been able to obtain comparable data from other countries, but we have no reason to think that their self-reports would be any more valid. For that reason we used gender and country-standardised BMI deciles as the basis for subsequent analyses, rather than using the BMI data to classify participants into the conventional overweight and obese categories.

The prevalence of perceived overweight and trying to lose weight in men and women are reported for each country in Table 2. Across the sample as a whole, women were more likely to perceive themselves as overweight than men, and much more likely to report trying to lose weight. Table 2 shows that around 45% of women perceived themselves as overweight in most of the participating countries. Curiously, the proportion who said that they were trying to lose weight was higher still (around 51%), suggesting that trying to lose weight is not motivated solely by feeling overweight. Fewer men reported feeling overweight (25%), and even fewer were trying to lose weight (21%). This gender difference is strikingly consistent across all of the countries in the sample, indicating common cultural pressures either for over-concern among women or under-concern among men.

As described above, BMI data were categorised into deciles for each gender and country sample, so when data were combined, the 1st decile denotes the thinnest and the 10th decile the fatter from each country. Figure 1 illustrates the prevalence of perceived overweight, for all countries combined, across the country-standardised BMI deciles. There is a steady increase in perceived overweight across the BMI deciles, although surprisingly, it does not reach 100% even in the highest decile. As expected, fewer men than women perceived themselves as overweight at any decile, but the shape of the male and female curves was very similar. Using curve estimation procedures, both curves best fitted

Table 2 Age-adjusted prevalence with 95% confidence intervals of perceived overweight and trying to lose weight in men and women from 22 countries

	Perceived overweight				Trying to lose weight			
	Men		Women		Men		Women	
	Percentage	95% CI	Percentage	95% CI	Percentage	95% CI	Percentage	95% CI
Belgium	28	23–34	59	54–65	21	15–26	50	44–55
England	22	17–26	39	34–43	15	11–20	48	43–53
France	13	09–18	38	34–43	10	05–14	39	35–44
Germany	20	15–25	23	19–28	18	13–23	42	37–46
Iceland	32	27–37	59	54–64	27	22–32	55	50–59
Ireland	24	15–33	45	40–50	19	11–28	52	47–57
Netherlands	20	14–25	43	38–47	15	10–21	43	38–47
USA	25	21–29	45	43–48	25	21–29	59	57–62
Bulgaria	22	18–27	39	35–43	19	14–24	56	52–60
Hungary	29	23–35	44	39–49	23	17–29	49	45–54
Poland	17	12–22	36	31–40	17	13–22	64	59–68
Romania	18	13–22	34	30–39	15	11–20	50	45–54
Slovak republic	29	25–32	43	39–46	24	21–28	49	46–53
Greece	25	20–29	30	25–34	29	24–33	56	51–60
Italy	19	15–22	34	32–37	18	15–21	45	43–48
Portugal	30	26–34	45	41–49	13	09–17	29	25–33
Spain	35	29–41	48	43–54	24	18–30	38	32–43
Japan	34	28–39	63	57–68	39	34–45	70	64–75
Korea	14	08–20	43	39–47	23	17–28	77	73–81
Thailand	31	26–36	55	51–59	26	21–31	54	50–58
Columbia	25	20–29	47	42–51	21	16–25	50	46–55
Venezuela	31	26–36	49	44–54	21	17–26	51	46–56

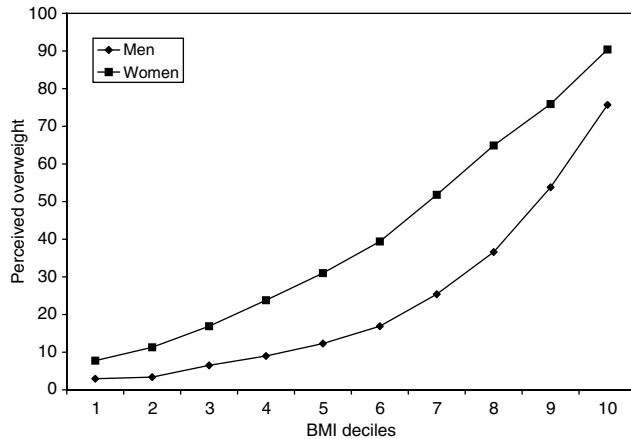


Figure 1 Prevalence of perceived overweight in men and women by BMI decile.

a quadratic model (males: $B = 0.012$, $P < 0.001$, $R^2 = 0.27$; females: $B = 0.007$, $P < 0.001$, $R^2 = 0.29$), although the gradient was steeper for women.

We can confidently assume that people in the lowest decile in any country are thin, and that none in the lowest four deciles are overweight, because no country has an overweight prevalence of more than 60% in this age group. These groups would also be thinner than the majority of their peers. If perceptions of weight were 'rational', no-one in these weight groups should feel overweight. Data from the men are consistent with this prediction, with fewer than 5% feeling overweight in either of the two lowest deciles and levels of perceived overweight only reaching 10% by the 5th decile. Among women, those in the lowest decile had a very low prevalence of feeling overweight (around 8%), although this rose to 17% by the 3rd decile and 20% in the 4th decile, supporting the trend of over-concern and misperception of weight in women. However, perceptions of overweight did not become normative (reported by more than 50%) until the 7th decile.

At the highest BMI decile, respondents from most countries would be overweight or close to overweight, along with a substantial proportion of those in the 9th decile and even the 8th in some countries. But even in the highest decile, 10% of women and 25% of men recorded themselves as 'about right', while in the 9th decile, this was the response of more than 20% of women and almost 50% of men. This indicates a strong tendency towards under-concern in men, who are failing to perceive when they are overweight. And even among women, the proportion who are overweight but unaware of it, is close to matching the proportion who perceive overweight when it is not present.

Trying to lose weight followed a similar trajectory to perceived overweight, as shown in Figure 2. In contrast to perceived overweight, the shape of the curves differed by gender, being negatively accelerating in women and positively accelerating in men. In support of this, using curve estimation procedures, the curve for women best fitted a

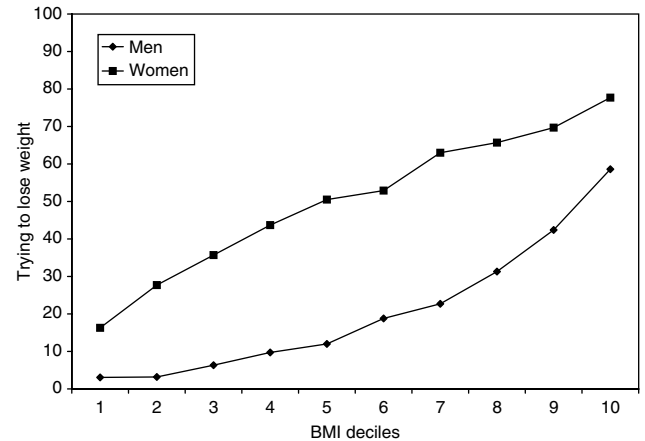


Figure 2 Prevalence of trying to lose weight in men and women by BMI decile.

cubic model ($B = 0.001$, $P < 0.05$, $R^2 = 0.13$), while the curve for men best fitted a quadratic model ($B = 0.008$, $P < 0.001$, $R^2 = 0.17$). Women's motivation to control their weight appeared to rise sharply round the middle deciles and then decelerate towards the upper end.

Many women in the lower deciles, despite not being overweight, were trying to lose weight. More than 30% of women in the third BMI decile were trying to lose weight, even though their weight must very likely be within the normal range. But surprisingly, not all women in the higher deciles were trying to lose weight when perhaps they should be. As expected, few men in the lower deciles were trying to lose weight, but less than 60% of men in the highest decile, almost all of whom would be overweight, were trying to lose.

Regional differences

Figure 3 shows the prevalence of overweight perceptions across BMI deciles for men and women for each of the five regions. The most striking feature is the consistency – especially for the men, for whom the curves are rarely more than a few percentage points apart and mostly overlapping. The curves are slightly more varied for women, with women from Mediterranean countries feeling consistently less overweight, while the women from Asian countries feel consistently more overweight than average.

To the extent that the curves are similar, they suggest that perceptions of overweight emerge relative to local weight conditions. Perceptions of overweight becomes normative (i.e. more than 50% of the sample feel it) at around the 6th and 7th deciles for women and the 8th decile in men – whatever the local levels of BMI. The most parsimonious conclusion is that women feel overweight if they are not in the bottom half of the distribution, while men feel overweight only if their weights are at the top of the distribution.

Figure 4 shows the pattern for trying to lose weight across BMI deciles. Again it is fairly consistent across regions for men, although the Asian men stand out as being more likely

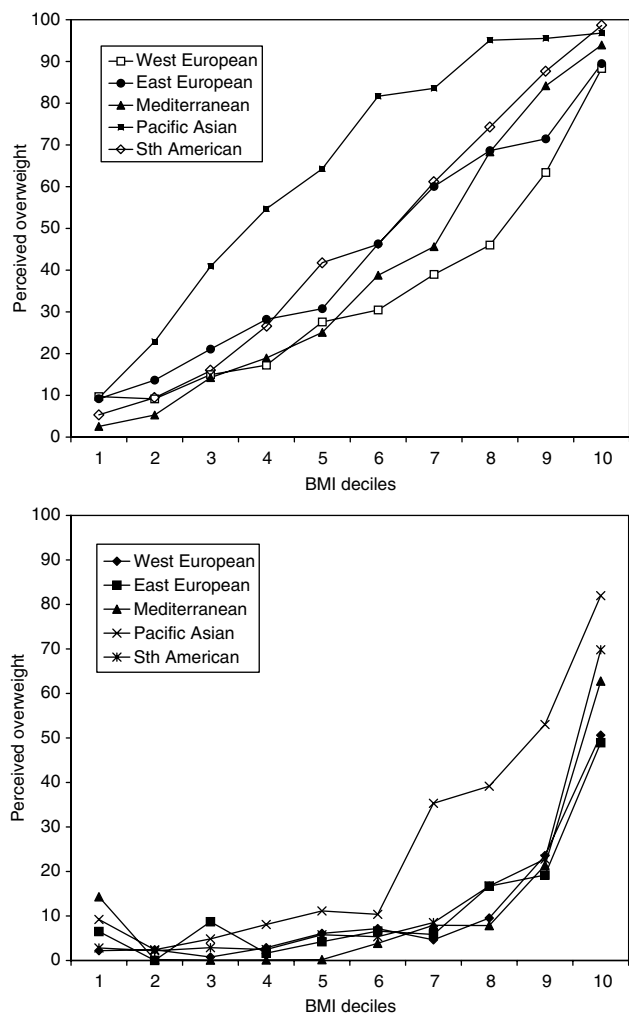


Figure 3 Prevalence of perceived overweight by BMI decile in men and women across five regions.

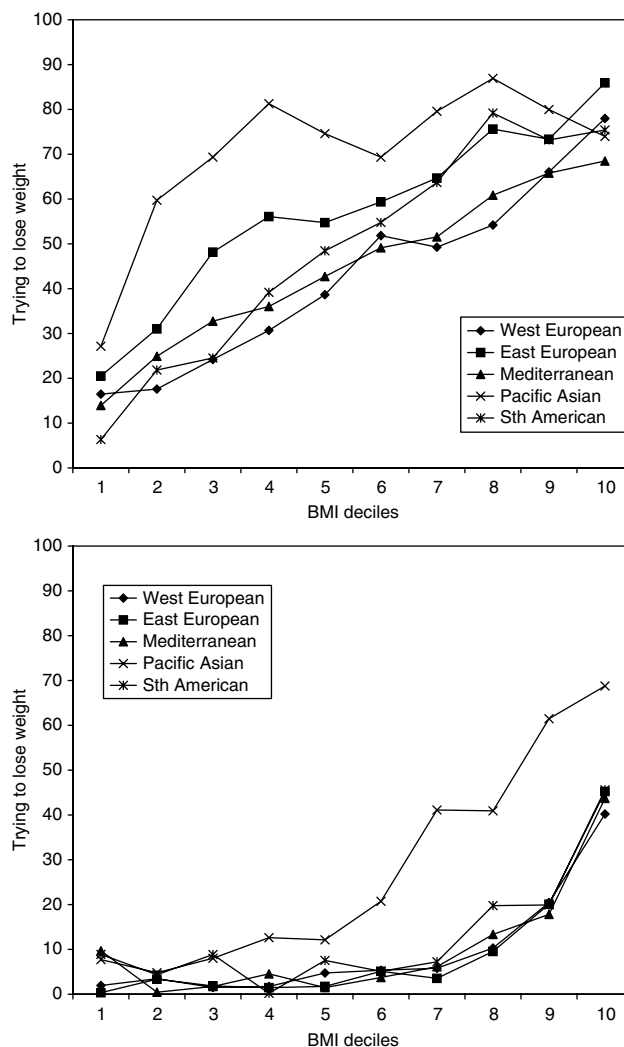


Figure 4 Prevalence of trying to lose weight by BMI decile in men and women across five regions.

to be engaging in deliberate weight control at all weight levels. The pattern for women is much more varied: women from Mediterranean countries are least likely to be trying to lose, while Asian women are strikingly more likely to be trying to lose weight, across the distribution.

Discussion

This study examined weight perceptions and weight loss behaviour in young men and women from around the world to examine the balance of ‘over-concern’ (feeling overweight and trying to lose weight at low weights) and ‘under-concern’ (not feeling overweight and not trying to lose weight at higher weights) in relation to gender and culture.

Interpretation of BMI results from self-reported data for height and weight is complicated by under-reporting. We compared the data from the English participants in the IHBS with data from a high SES subsample in the same age group

from the Health Survey for England where weights and heights were measured on a nurse visit. This indicated that weight was underestimated and height was overestimated, leading to a substantial under-estimation of BMI.¹⁷ As others have concluded,^{18–20} this makes it inappropriate to apply the conventional cut-points of BMI to identify overweight and obesity. Our solution was to categorise the BMI data into deciles within each gender and country sample. On this basis, we could be sure that participants in the lowest decile were among the thinnest for their sex in their country, while those in the highest decile were fattest. Those in the lowest decile would also be thin in absolute terms, while those in the highest decile would be overweight or obese. That allowed us to look at the outcomes of interest in this study in both thin and overweight respondents in relation to gender and country. Examining perceptions of weight and weight loss behaviours across the deciles also highlighted

differences in the patterning of concerns about weight by gender or region.

These results showed that very few men who are below the 7th decile for their country feel overweight, and even by the 9th and 10th deciles, there are still many who do not describe themselves as overweight – especially among the Europeans and North Americans. The picture is more varied for women, but perceived overweight rises rapidly across the deciles becoming normative by around the 6th or 7th decile and ultimately reaching close to 100%.

The patterns for trying to lose weight are different. Among men, the proportions who were trying to lose weight were consistently just below the proportion who felt overweight, while among women, the proportion trying to lose weight exceeded the proportion perceiving themselves overweight up to the 7th decile. One explanation is that trying to lose weight is almost the norm for women. These results point to the risk that promoting weight control in women could further increase unnecessary weight loss efforts in women who are not overweight. Whether this would be a significant public health hazard depends partly on what 'trying to lose weight' actually means for these comparatively slim young women. If they are engaging in meal skipping and nutritionally inadequate diets, they would be compromising their health. But if they are making healthier food choices and taking more exercise, then they are probably doing themselves no harm and may even be successfully learning how to ward off weight gain in later life.^{21,22} It is certainly the case in most developed countries that women from higher socio-economic groups, who put the greatest efforts into weight control, have the lowest levels of obesity, suggesting that further investigation of 'normal' weight control is an important issue.²³

The group that stand out internationally are the Asians. In total, 70% of Japanese women said that they were trying to lose weight, along with 63% of Japanese men. In fact, there are recent data to suggest that young Japanese women are one of the few groups to be getting slimmer over time – in contrast to all age groups in most other countries and all other age and sex groups in Japan.^{24,25} Although the lower BMI cutoff for overweight in Asians populations might temper the effect,^{26,27} the trend towards misperception of overweight emphasises the need for more close examination of what is 'normal' weight control with respect to this sociocultural environment.

The shape of the curve of trying to lose weight across deciles differed between men and women. It increased rapidly across the middle deciles and then decelerated across the higher deciles for women, which may reflect women defining overweight or 'fat' at a lower BMI than the medically accepted definition.^{23,28} Men showed a more 'rational' association, with almost none trying to lose at the lower deciles and a rapid increase at the higher deciles. However, there was still a strikingly low level of trying to lose weight among the heaviest men, consistent with other European and US research.^{11,29,30} Possibly women and men

mean different things by 'trying to lose weight'; men may think that it denotes something more extreme than exercising and eating a healthy diet. We also know that men are more sceptical than women about the efficacy of healthy food choice as a weight control option,³¹ and the results could reflect their widely reported ambivalence towards many health behaviours.^{31,32} Novel interventions and specially targeted messages may be needed to persuade overweight young men to take the problem seriously. Whatever the explanation, the results highlight the need to refocus research into weight control to address men as much as women.

Perceptions of overweight and attempts to lose weight were lowest in women from Mediterranean countries and highest in those from the Asian countries, indicating that local cultural factors may moderate attitudes to weight. Mediterranean culture might confer not only the beneficial effects of the local diet³³ but also a more relaxed relationship with eating and weight.³⁴ Contrary to our expectations, women in the USA and UK reported moderate levels of weight concern, while women from Asia reported extremely high levels. Japanese women had the highest prevalence of perceived overweight (63%), with Thailand second. Weight concern in the Asian men was also high, but not as disparate from other samples. Large variations in perceived weight and trying to lose weight were identified in the EHBS 10 years earlier.³⁵ These results suggest that it would be useful to gain a better understanding about the variation between countries.

There are limitations to the study that influence the interpretation of the findings. The self-report bias for weight and height has already been discussed, although this is a common limitation in survey data. Our results, which showed gross under-estimation of overweight and obesity, highlight the need for objective anthropometric data for reaching any conclusions about the correlates of weight status, and it is unfortunate that this is rarely practical in survey designs. If there were adequate existing data on measured weights and heights for this age and social group in each country, we could have used them to anchor our results, but they were not available in more than a few cases.

We used country-standardised weight deciles to get around some of the difficulties, but this leaves some questions unanswered. Our assumption that people in the highest decile would be overweight, and those in the lowest decile would be thin, is surely correct, but within the middle deciles, we cannot be certain where overweight begins. This approach also had the advantage of encouraging us to look at the patterning of weight across locally standardised deciles and therefore allowed us to see whether the association of weight concern with BMI was consistent across countries. Curiously there have been few if any studies relating weight perceptions to local weights,^{12,13} although the finding that perceptions of overweight are lower in lower SES groups, could be linked to the different prevalence of overweight in lower and higher SES groups.^{12,13,23} The sample for the

present study was, by definition, well-educated, and in such groups the prevalence of overweight and obesity are lower. Nevertheless, levels of overweight and obesity have increased dramatically, and the prevention perspective emphasises the need to target the younger age groups.

The use of single items to assess weight perception and trying to lose weight was a serious limitation but an inevitable drawback of using data from a wide-ranging health behaviour study where the number of items relating to any one behaviour is limited. However, the very large sample size mitigated the effect of this to some extent.

In summary, perceptions of overweight showed striking international consistency, indicating that across the world, young women in the top half of the weight distribution perceive themselves as overweight and are trying to lose weight, while men appear to be more comfortable with their weight. These findings raise concerns about the 'normalising' of overweight and lack of attempts to lose weight in relation to the increase in obesity seen throughout the modern world. More needs to be done to understand weight perceptions in young educated men and women, and to establish the kinds of weight control efforts that are likely to pay dividends in the general population.

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