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Running head: Body weight gain in university students

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Summary

Objective: This study explored factors associated with body weight gain among British university students who were members of a slimming club.

Method: Student members of a national commercial slimming programme completed an online survey about cooking ability, weight gain, eating habits and physical activity levels. Non-parametric statistical tests and regression analysis were employed to examine factors associated with weight gain.

Results: The dataset comprised 272 current students. The majority of students (67%) reported weight gain between 3.2 and 12.7 kg during university: 20.4% reported to have gained >12.7 kg. Students commonly attributed their weight gain to academic stress and nearly all identified with needing support to learn to cook on a budget. Students reporting greatest weight gain had most frequent consumption of ready meals & convenience foods, take-away & fast foods, and least frequent consumption of fruits & vegetables. Weight-stable students reported lowest consumption of alcohol and were most able to cook complex meals. Students who reported greatest weight gain reported lower physical activity levels. There were inter-correlations between cooking ability and lifestyle factors. In a multivariate model, low physical activity and frequent consumption of ready meals and convenience food independently predicted weight gain.

Conclusion: Weight gain was inversely associated with diet quality, cooking ability and physical activity with reliance on ready meals & convenience food and low physical activity particularly important. Prospective studies are needed to confirm these cross-sectional associations and to explore how the university setting may contribute to the effect.

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Introduction

Approximately 25% of adults in England are obese (Health and Social Care Information Centre, 2015). Obesity places a substantial burden on society, fuelling hospital admissions and annual health care costs (Ellison, 2013). As the UK attempts to reverse the rising trend of obesity among its adult population (Ellison, 2013), it is critical to identify population groups at particular risk and to elucidate the factors underpinning risk in order to effect and target weight management interventions.

The first year of university has been identified as an 'at risk' period for body weight gain, and a 'Freshman 15' phenomenon has been proposed, which posits that first-year university students gain 15lbs (6.8 kg) (Brown, 2008). Although most studies record lesser average weight gain, weight gain is variable (0.7-3.1kg) (Crombie et al., 2009). Furthermore, when only students who gain weight are considered, observed weight gain is greater and the range narrower (3.1-3.4kg) (Crombie et al., 2009). North American studies predominate this literature, but UK studies have identified a similar phenomenon: an average weight change of +2.5kg was noted among first year female undergraduate students in a single semester, with 22% of students gaining in excess of 6.8kg (Cockman et al., 2013). A multi-centre UK study recorded lesser average weight gain (0.83kg) during the first three months of university, but body weight change was variable (-7.2kg to +11.6kg) (Finlayson et al., 2012). Studies among British non-student populations are not available, although US studies show lower levels of weight gain in the general population (Levitsky et al., 2004).

Despite the wealth of literature describing body weight gain at university, the factors underpinning these changes are less clear (Cockman et al., 2013). Several studies have reported increased consumption of processed and take-away foods and/or decreased consumption of fruit and vegetables among students who gain weight (Levitsky et al., 2004; Pliner and Saunders, 2008; Pullman et al., 2009); others report no association between eating patterns and weight change (Holm-Denoma et al., 2008; Kasparek et al., 2008; Racette et al., 2005). Alcohol intake has also been implicated (Adams and Rini, 2007; Butler et al., 2004; Economos et al., 2008; Lloyd-Richardson and Lucero, 2008). Counter-intuitively, most North

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American studies, which have employed a detailed assessment of diet have not observed increased energy intake among weight gainers (Butler et al., 2004; Jung et al., 2008; Pullman et al., 2009). Studies focusing on the psychological constructs of eating behaviour have reported a link between weight change and dietary restraint, disinhibition, history of dieting and stress (Economos et al., 2008; Finlayson et al., 2012; Girz et al., 2013; Levitsky et al., 2004; Lowe et al., 2006; Serlachius et al., 2007). The relationship between physical activity and weight change is also unclear (Butler et al., 2004; Edmonds et al., 2008; Finlayson et al., 2012; Racette et al., 2005) and lack of body composition measures often blurs interpretation. Further research is necessary to delineate the factors behind weight gain among university students.

The objective of the current study was to examine dietary habits, physical activity levels and perceived reasons for weight gain in relation to body weight gain among university students in the UK. Access to data from a national weight management programme (Slimming World, UK) afforded an opportunity to examine the issue in students who self-identified as needing to lose weight. Research to date has sampled from the general student population (Cockman et al., 2013; Finlayson et al., 2012; Nikolaou et al., 2014).

Methods

Members of Slimming World UK who were past or current university students were invited to complete an online survey during autumn 2013. The survey collected the following information: gender; age; student status (current vs. former student); number of years at university; weight gain at university; body weight prior to starting university (underweight – severely overweight); perceived reasons for weight gain; previous attempts at weight loss; perceived barriers to consuming a healthy diet at university; cooking ability; self-reported understanding of a healthy diet (non-existent to very good); consumption frequency of fruits and vegetables, fast food/takeaways, and convenience foods/ready meals; perceived healthfulness of food available on campus; alcohol consumption; effect of alcohol intake on food choices; ability to cook, shop and eat healthily on a student budget; factors influencing food choices at university; and physical activity levels at university. Participants answered all questions in

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relation to their behaviours at university before joining Slimming World. Response options (e.g. frequency of consumptions; categories of weight gain; factors influencing food choices) were provided for each question.

The survey was designed and administrated by staff at Slimming World Headquarters. There were no incentives for participation. A total of 1060 Slimming World members who were either current or former university students responded to the survey. This data analysis used a subset of respondents from the original survey; students who were no longer at university (n=781) and male students (n= 5) were excluded. The former exclusion was instigated to improve data quality, since current students would be expected to more accurately recall dietary and physical activity habits and weight gain at university than graduates. Male students were excluded because they were few in number.

Self-reported weight gain at university was categorised: 0 kg (weight-stable); <3.2 kg (<0.5 stones); 3.2-6.4 kg (0.5-1 stone); 6.4-12.7 kg (1-2 stones); >12.7 kg (>2 stones). No participant in the current study reported weight loss at university. Category of weight gain was examined against perceived reasons for weight gain at university using non-parametric tests (SPSS Statistics V23). An ordinal logistic regression model was fitted to establish the independent effect of descriptively significant variables (cooking ability, food frequency and physical activity) as predictors of weight gain category. The statistical analysis was conducted using SPSS (IBM SPSS 23.0, IBM Armonk, USA).

Results

Approximately half of the sample (47.6%) was between 18 and 21 years of age and just under one quarter (22.3%) of respondents were between 22 and 30 years old. The majority of responders had been members of Slimming World for less than a month (46.0%) or between 3-6 months (29.9%) at the point of survey.

Table 1 provides descriptive data for reported weight gain, food group consumption and physical activity. An eighth of respondents (12.5%) were weight stable during their time at university, while over half (55.4%) reported gaining in excess of 6.4kg. Only 15.6% of students reported no weight gain during their first year at university compared to 34.4% who reported gaining more than 6.4kg.

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58.1% of students reported the same level of weight gain in the two time periods while 40.7% reported a higher level of weight gain overall than in first year (Wilcoxon=193, n=270, p<0.001).

Table 1 also shows descriptive data for physical activity and food consumption. Self-reported physical activity levels at university varied from 'not at all active' (14.3%) to 'active or very active' (14.3%). Less than one in four respondents reported that they consumed fruit and vegetables every day when at university, whilst one in three indicated that they consumed fruit and vegetables once a week or less. Self-reported consumption of takeaways/fast food meals was high, with just over half the sample (50.5%) reporting eating take-away & fast food several times per week or more; just under a half (47.8%) of respondents reported consuming ready meals & convenience food more than three times per week, with fewer than one in five respondents (18.2%) reporting consumption of these foods greater than 5 times per week. One third of respondents (33.7%) also reported that they consumed alcohol on '3 or more nights per week'.

Table 2 provides information on students' self-assessment of their ability to cook various dishes. The dishes ranged from the simple, such as cheese on toast to the complex, such as a roast dinner. While 73 (26.6%) of the sample reported being able to cook all fourteen of the dishes, less than 5% reported being able to cook three or less dishes. Around 40% of students could not make dishes such as shepherd's pie, homemade soup and chilli con carne. Fewest students reported being able to cook a stew/casserole, with just over half of students claiming competency. A total of 82.7% of the sample agreed with the statement 'students need support to learn how to cook healthy food/meals' and 91.9% agreed with the statement 'students need support to learn how to eat healthily on a budget'.

There were several significant associations between cooking ability and category of weight gain (see Table 3). Specifically, a significantly higher proportion of students in the weight stable group reported that they were able to cook the following meals from scratch: stir-fry, homemade burger, soup, casserole/stew and shepherd's pie. Students who reporting greater difficulty in shopping, cooking and eating healthily on a student budget reported greater weight gain ($\rho = 0.237$; $df = 265$; $p < 0.001$).

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Chi-square tests indicated statistically significant associations between level of weight gain and several food consumption measures, as well as physical activity. These cross-tabulations are shown in Table 4. Specifically, students reporting greatest weight gain (>12.7 kg) were more likely have to be frequent consumers of ready meals & convenience foods and takeaway & fast food and least likely to consume fruit & vegetables on a daily basis. There was also a trend (p=0.058) for alcohol consumption to be associated with weight gain; students in the top two categories of weight gain (6.4-12.7kg and >12.7kg) had the highest proportion of frequent drinkers. Weight gain at university was inversely associated with self-reported physical activity: students reporting greatest weight gain at university (>12.7 kg) were least likely to report that were 'fairly active' (60-90 minutes activity per week) or 'active'/'very active'.

Cooking ability was correlated with alcohol consumption (ρs=-0.226, n=273, p<0.001), consumption of takeaway & fast food (ρs=-0.241, n=273, p<0.001), fruit & vegetables (ρs=0.380, n=273, p<0.001), consumption of ready-meals & convenience food (ρs=-0.320, n=274, p<0.001) and physical activity levels at university (ρs=0.166, n=273, p<0.006).

After multivariate adjustment (Table 5) only frequency of consumption of ready meals & convenience food and physical activity were associated with weight gain. Specifically, the ordinal logistic regression model showed that the odds of weight gain increased at all lower levels of physical activity, while the odds of weight gain decreased with less frequent consumption of ready meals. The model used had a pseudo r-squared of 23.4%.

There were also significant associations between pre-university body weight and weight gain at university (χ^2=33.75 df=12; p<0.001). The most striking difference was that students who were weight stable at university invariably reported being overweight or severely overweight prior to starting university compared to students who gained body weight at university. Between 23.8% and 43.5% of the latter groups reported being of a healthy body weight prior to starting university.

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When perceived reasons for weight gain at university were examined 'eating unhealthily due to stress relating to studies' was significantly associated with level of weight gain at university (χ^2 = 79.47; df=4; p<0.001). A greater proportion (90%) of students in the 6.4-12.7 kg group attributed their weight gain to stress compared to approximately 70% of students in other weight gaining groups. There was also only one significant association between weight gain and factors influencing food choice at university: respondents in the weight stable group were less likely to report cost as an important influence on their food choices at university (χ2 =15.25; df = 4; p = 0.004).

Discussion & Conclusion

The current study set out to examine eating habits associated with weight gain among UK university students who were members of a slimming club. This focus on a weight-gaining sub-group of the student population who have sought help from a commercial slimming organisation, as opposed to the general student population (Cockman et al., 2013; Finlayson et al., 2012) provides particular perspective. We found considerable variation in weight gain during the first year of university with about a third of students reporting a gain greater than 6.4kg (equivalent to 1 stone). This level of weight gain would be considered clinically significant for an average woman weighing 71kg (>7percent of body weight) and may have important long-term health implications. Meta-analytic data record average weight gain to be 1.36kg over the first year of student life for all students, while the corresponding figure for students who gain weight (excluding weight stable and weight losing students) was 3.38kg (Vadeboncoeur et al., 2015). Clearly recruitment via a slimming club selects people who have a weight problem and who have experienced substantial and greater than average weight gain. This assertion is supported by data from a separate survey of Slimming World student members, which documented that new members had on average a Body Mass Index of 31.0 kg/m^2 upon entry to the programme (Smith et al., 2014).

Overall, reported weight gain over the entire university time period was greater than that reported during first year, concurring with a meta-analysis of studies

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that assessed weight gain in students beyond the first year (Fedewa et al., 2014). However, our data also showed that rates of weight gain slowed after the first year for nearly 60% of students, contrary to the meta-analytic study. Our data are in line with the expectation that membership of a slimming club may ameliorate weight gain, and Slimming World data on weight loss in student members, which recorded a weight loss of approximately 5kg for those who were overweight and obese and 3kg for those who were a healthy weight after 12 weeks membership (Smith et al., 2014).

We identified clear associations between weight gain and eating habits. As weight gain increased diet quality decreased, with students reporting greatest weight gain reporting least frequent consumption of fruits & vegetables and most frequent consumption of alcohol, take-away & fast food, and ready meals & convenience foods. Additionally, we identified an association between cooking ability and weight gain, and were able to discriminate students' level of weight gain according to their ability to cook more culinary complex meals.

Interestingly, cooking ability was negatively correlated with consumption frequencies of alcohol, takeaway & fast food and ready meals & convenience foods, and positively correlated with consumption of fruit & vegetables and physical activity. All these correlations were of moderate magnitude. It is evident that a constellation of lifestyle habits may be working together to increase risk of weight gain confirming the cluster analysis approach of Greene et al in a large cross-sectional study of both male and female North American students (Greene et al., 2011).

A multivariate model revealed that weight gain was most strongly associated with frequency of consumption of ready meals & convenience food and low physical activity. An axis between poor cooking skills, consumption of ready meals and risk of obesity has previously been documented in a non-student population (van der Horst et al., 2011), and ready meal consumption has been associated with the prevalence of obesity in Brazilian women (Lobato et al., 2009). Supermarket ready meals in the UK have been criticised for their high fat and salt content (Remnant and Adams, 2015), although limited data suggest that they are not consistently high in calories (Celnik et al., 2012). More generally, convenience food consumption has been implicated in the temporal rise in obesity rates in

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Australia (Dixon et al., 2006). Notably, convenience food is heterogeneous in type and diverse in nutrient composition, for example it can range in type from highly processed foods such as canned ravioli to single foods such as frozen French fries and unprocessed salads (Brunner et al., 2010). The finding that low physical activity is associated with weight gain concurs with other weight gain studies of university students (Butler et al., 2004; Edmonds et al., 2008; Greene et al., 2011). Although the strongest connections between weight gain and lifestyle metrics are for low physical activity and consumption frequency of ready meals & convenience food, our internal correlations suggest that a multi-behavioural effect is influencing risk of weight gain.

Stress was identified by students as a factor leading to weight gain particularly for students gaining between 6.4 and 12.7kg of body weight, congruent with a previous UK study (Serlachius et al., 2007). The relationship between academic stress and calorie intake is inconsistent (Barker et al., 2015), but high stress has been reported to induce a hyperphagic response and tendency to consume high-fat, high-sugar foods particularly in restrained eaters (Habhab et al., 2009; Wardle et al., 2000). Moreover, a qualitative study exploring emotional eating behaviours among North American university students reported that female students identified stress as a primary trigger for abandonment of normal eating patterns and increased food consumption (Bennett et al., 2013). The fact that students reporting greatest weight gain were not so likely to report stress as a perceived reason for their weight gain is unclear, although one possible explanation may be that these students are less susceptible to emotional hunger cues. Psychometric measures of eating behaviour are needed to confirm this possibility.

Finally, the relationship found between bodyweight going to university and weight gain thereafter is likely to be an artefact of our sampling frame. Students whose pre-university body weight was in the normal range and who did not gain weight are unlikely to be included in our sample. The relationship between baseline body composition and weight change has been examined, but remains unclear (Kasparek et al., 2008; Mifsud et al., 2009; Mihaolopoulos et al., 2008; Provencher et al., 2009). It is possible that overweight students arriving at university are already engaging in practices to prevent further weight gain, whilst those who begin university at a healthy body weight are less aware of a need to engage in

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behaviours that promote weight stability. Greater awareness among students about the risk of body weight gain at university may therefore be necessary.

Despite the novel nature of our study focusing on a weight-gaining subgroup of the general student population, it has a number of weaknesses. Specifically, our sample was female, prohibiting extrapolation to the general student body. However, this female predominance reflects the gender split of the national Slimming World membership (Stubbs et al., 2015). Additionally, all data in the current study was gathered using self-report and retrospective measures; lifestyle information may have been particularly difficult to accurately recall given that lifestyle changes would have been promoted – and likely implemented - upon joining Slimming World. However, restriction of the dataset to current students who had recently joined the programme reduced the likelihood of such error. Notably self-reported and researcher-measured body weight among university students shows strong correlation in student populations (Delinsky and Wilson, 2008; Economos et al., 2008; Lloyd-Richardson et al., 2009). There is additionally no reason to believe any form of recall bias according to weight gain group occurred, reinforcing the validity of associations. As for many dietary studies, the collinearity observed between food and lifestyle behaviours would suggest that a large sample size or complex design is necessary to unpick the independent effects of single food behaviours.

Future research should now focus on this weight-gaining sub-group of the student population to further delineate reasons for weight gain and identify students at risk. Prospective studies are necessary to strengthen findings, and qualitative methods would enhance understanding. Ultimately this research is important to inform the development of interventions to reduce clinically significant weight gain during early adulthood. Indeed while a mobile phone-based intervention programme targeting dietary behaviour and physical activity has been shown to be effective in preventing weight gain in a young Australian adults (Partridge et al., 2016), there is limited study which addresses obesity prevention in student and non-students (Allman-Farinelli, 2015). British research investigating weight gain among a comparable non-student population is also pertinent to determine the extent to which the university setting is responsible for weight gain.

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Table 1: Self-reported weight gain, eating behaviours and physical activity levels at university prior to joining Slimming World

		Number	Percentage (%)
Self-reported body weight gain throughout university	0 kg	34	12.5
	<3.2 kg	24	8.9
	3.2-6.4 kg	63	23.6
	6.4-12.7 kg	95	35.1
	>12.7 kg	55	20.3
Self-reported body weight gain during the first year	0 kg	42	15.6
	<3.2 kg	58	21.5
	3.2-6.4 kg	77	28.5
	6.4-12.7 kg	74	27.4
	>12.7 kg	19	7.0
Consumption of alcohol	Never	34	12.5
	Less than once per week	49	17.9
	1-2 nights per week	98	35.9
	3 or more nights per week	92	33.7
Consumption of takeaways & fast food at university	None	23	8.4
	Once a week	112	41.0
	A few a week	127	46.5
	>5 a week	11	4.0
Consumption of ready meals & convenience foods	Never	20	7.3
	Once a week	39	14.2
	1-3 per week	84	30.7
	3-5 per week	81	29.6
	>5 per week	50	18.2
Consumption of fruits & vegetables	Never	3	1.1
	Once or less week	87	31.9
	2-3 times per week	78	28.6
	4-5 times per week	38	13.9
	Every day	67	24.5
Physical activity levels	Not at all active	39	14.3
	Rarely active (<30 minutes/week)	82	30.0
	Sometimes active (30-60 minutes/week)	71	26.0
	Fairly active (60-90 minutes/week)	42	15.3
	Active (>90- minutes/week)	39	14.3

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Table 2 Proportion of students reporting that they are able to cook specific meals

Meal	Number	%
Cheese on toast	260	95.2%
Tinned spaghetti hoops on toast	255	93.4%
Baked beans on a jacket potato	250	91.6%
Scrambled eggs on toast	236	86.4%
Full English breakfast	231	84.6%
Stir-fry	214	78.4%
Spaghetti Bolognese	193	70.7%
Shepherds Pie	174	63.7%
Roast dinner	168	61.5%
Homemade soup	166	60.8%
Chilli con carne	152	55.7%
Homemade burger	149	54.6%
Curry	143	52.4%
Casserole/stew	141	51.6%

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Table 3 Weight gain at University tabulated against self-reported ability to cook specific meals; number and percentage of column totals in parentheses.

Weight Gain	None	<3.2 kg	3.2-6.4 kg	6.4-12.7 kg	>12.7 kg	Chi-squared Test
Cheese on toast	31 (91.2%)	22 91.7%	61 96.8%	89 93.7%	54 98.2%	3.44 P=0.497
Tinned spaghetti hoops on toast	31 91.2%	23 95.8%	59 93.7%	85 89.5%	54 98.2%	4.59 P=0.327
Baked beans on a jacket potato	29 85.3%	22 91.7%	58 92.1%	84 88.4%	54 98.2%	5.76 P=0.218
Scrambled eggs on toast	31 91.2%	23 95.8%	58 92.1%	77 81.1%	45 81.8%	7.47 P=0.113
Full English breakfast	32 94.1%	18 75.0%	58 92.1%	77 81.1%	43 78.2%	9.14 P=0.058
Stir-fry	31 91.2%	20 83.3%	55 87.3%	65 68.4%	40 72.7%	12.92 P=0.120
Spaghetti Bolognese	26 76.5%	16 66.7%	52 82.5%	64 67.4%	33 60.0%	8.50 P=0.075
Shepherds pie	27 79.4%	13 54.2%	46 73.0%	52 54.7%	35 63.6%	10.25 P=0.036
Roast dinner	26 76.5%	16 66.7%	43 68.3%	50 52.6%	31 56.4%	8.44 P=0.077
Homemade soup	27 79.4%	15 62.5%	45 71.4%	52 54.7%	26 47.3%	13.66 P=0.008
Chilli con carne	21 61.8%	15 62.5%	39 61.9%	51 53.7%	24 43.6%	5.32 P=0.056
Homemade burger	25 73.5%	12 50.0%	40 63.5%	44 46.3%	26 47.3%	10.92 P=0.027
Curry	23 67.6%	13 54.2%	38 60.3%	42 44.2%	25 45.5%	8.38 P=0.079
Casserole/stew	25 73.5%	13 54.2%	38 60.3%	37 38.9%	26 47.3%	15.01 P=0.005

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Table 4: Weight gain while at University tabulated against dietary consumption measures and physical activity; number and percentages of consumption categories in parentheses

Weight gain	None	<3.2 kg	3.2-6.4 kg	6.4-12.7 kg	>12.7 kg	Chi-squared Test
Frequency of consumption of alcohol						
Never	7 (20.6%)	3 (8.8%)	4 (11.8%)	13 (38.2%)	7 (20.6%)	20.54 P=0.058
< 1 night per week	9 (18.8%)	7 (14.6%)	11 (22.9%)	14 (29.2%)	7 (14.6%)	
1-2 nights per week	12 (12.5%)	9 (9.4%)	30 (31.3%)	27 (28.1%)	18 (18.8%)	
3 + nights per week	6 (6.5%)	5 (5.4%)	17 (18.5%)	41 (44.6%)	23 (25%)	
Frequency of consumption of take-aways & fast food						
Never	5 (22.7%)	6 (27.3%)	4 (18.2%)	5 (22.7%)	2 (9.1%)	41.65 P<0.001
Once a week	20 (18%)	11 (9.9%)	29 (26.1%)	34 (30.6%)	17 (15.3%)	
A few a week	8 (6.3%)	4 (3.2%)	28 (22.2%)	55 (43.7%)	31 (24.6%)	
5 plus a week	0 (0%)	3 (27.3%)	2 (18.2%)	1 (9.1%)	5 (45.5%)	
Frequency of consumption of fruit & vegetables						
Never	0 (0%)	1 (33.3%)	2 (66.7%)	0 (0%)	0 (0%)	
Once or less a week	6 (7.1%)	5 (5.9%)	18 (21.2%)	30 (35.3%)	26 (30.6%)	34.08 P=0.005
2-3 a week	8 (10.4%)	5 (6.5%)	15 (19.5%)	35 (45.5%)	14 (18.2%)	
3-5 a week	4 (10.5%)	3 (7.9%)	10 (26.3%)	15 (39.5%)	6 (15.8%)	
Everyday	16 (23.9%)	10 (14.9%)	18 (26.9%)	15 (22.4%)	8 (11.9%)	
Frequency of consumption of ready meals & convenience foods						
Never	7 (35%)	3 (15%)	5 (25%)	4 (20%)	1 (5%)	44.14 P<0.001
Once a week	5 (12.8%)	6 (15.4%)	13 (33.3%)	11 (28.2%)	4 (10.3%)	
1-3 times a week	11 (13.4%)	8 (9.8%)	24 (29.3%)	29 (35.4%)	10 (12.2%)	
3-5 times a week	8 (9.9%)	4 (4.9%)	15 (18.5%)	35 (43.2%)	19 (23.5%)	
More than five times a week	3 (6.1%)	3 (6.1%)	6 (12.2%)	16 (32.7%)	21 (42.9%)	
Level of physical activity						
Not active at all	3 (7.9%)	5 (13.2%)	7 (18.4%)	11 (28.9%)	12 (31.6%)	40.16 P=0.001
Rarely active	6 (7.3%)	4 (4.9%)	17 (20.7%)	32 (39%)	23 (28%)	
Sometimes active	9 (13%)	4 (5.8%)	12 (17.4%)	29 (42%)	15 (21.7%)	

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Fairly active	4 (9.5%)	4 (9.5%)	16 (38.1%)	15 (35.7%)	3 (7.1%)	
Active or very active	11 (28.2%)	7 (17.9%)	11 (28.2%)	8 (20.5%)	2 (5.1%)	

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Table 5 Results of ordinal logistic regression predicting odds of moving to a greater weight gain classification according to lifestyle categories (odds ratios with 95% confidence intervals (CI); highest frequency/category as referent)

	Odds Ratio	Lower CI	Upper CI
Cooking Score	0.956	0.891	1.026
Alcohol never	1.214	0.554	2.659
Alcohol <1night per week	0.585	0.297	1.153
Alcohol 1-2 nights per week	0.733	0.421	1.278
Alcohol 3+nights per week	1		
Take-aways & Fast food never	1.076	0.234	4.953
Take-aways & fast food once a week	1.240	0.339	4.531
Take-aways & fast food few times per week	1.925	0.553	6.706
Take-aways & Fast food 5+ times per week	1		
Fruit & vegetables never	0.133	0.015	1.201
Fruit &vegetables once or less per week	1.430	0.697	2.939
Fruit & vegetables 2-3 times per week	1.029	0.513	2.063
Fruit & vegetables 3-5 times per week	1.432	0.666	3.080
Fruit & vegetables every day	1		
Ready meal never	0.162	0.051	0.509
Ready meal & convenience food once per week	0.349	0.141	0.865
Ready meal & convenience food 1-3 per week	0.349	0.163	0.751
Ready meal & convenience food 3-5 times per week	0.474	0.227	0.989
Ready meal & convenience food >5 times per week	1		
Physical activity not active	3.391	1.363	8.432
Rarely active	3.508	1.597	7.706
Sometimes active	2.798	1.305	6.001
Fairly active	1.879	0.827	4.272
Physical activity active or very active	1		

Note - The ordered weight gain classifications are (1) None, (2) <3.2kg, 3) 3.2-6.4kg, 4) 6.4-12.7kg, 5) >12.7kg. The overall model was significant (p=0.011)

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