Title: Postpartum diet quality in Australian women following a gestational diabetes pregnancy

Running title: Postpartum diet quality in GDM

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Abstract

Background/Objectives: To describe the diet quality of a national sample of Australian women with a recent history of GDM and determine factors associated with adherence to national dietary recommendations.

Subjects/Methods: A postpartum lifestyle survey with 1499 Australian women diagnosed with GDM ≤3 years previously. Diet quality was measured using the Australian Recommended Food Score (ARFS) and weighted by demographic and diabetes management characteristics. Multinominal logistic regression analysis was used to determine the association between diet quality and demographic characteristics, health seeking behaviours and diabetes related risk factors.

Results: Mean (±SD) ARFS was 30.9±8.1 from a possible maximum score of 74. Subscale component scores demonstrated that the nuts/legumes, grains and fruits were the most poorly scored. Factors associated with being in the highest compared with the lowest ARFS quintile included age (OR 5 year increase =1.40; 95% CI:1.16-1.68), tertiary education (OR=2.19; 95% CI:1.52-3.17), speaking only English (OR=1.92; 95% CI:1.19-3.08), being sufficiently physically active (OR=2.11; 95% CI:1.46-3.05), returning for postpartum blood glucose testing (OR=1.75; 95% CI:1.23-2.50) and receiving risk reduction advice from a health professional (OR=1.80; 95% CI:1.24-2.60).

Conclusions: Despite an increased risk of type 2 diabetes, women in this study had an overall poor diet quality as measured by the ARFS. Women with GDM should be targeted for interventions aimed at achieving a postpartum diet consistent with guidelines for chronic disease prevention. Encouraging women to return for follow-up and providing

risk reduction advice may be positive initial steps to improve diet quality, but additional strategies need to be identified.

Keywords: Gestational diabetes, diet quality, women

Gestational diabetes mellitus (GDM) is a form of glucose intolerance diagnosed during pregnancy.[1] It affects an estimated 5% of Australian women, increasing up to 14% in some high risk groups.[2] GDM is associated with increased perinatal risks, while longer term consequences include development of type 2 diabetes and increased cardiovascular risk.[3] Although research to date has varied in estimates of future type 2 diabetes risk, one recent Australian study reported a 9.6 times greater risk of type 2 diabetes in women with previous GDM and a cumulative risk of 25% after 15 years.[4]

Research demonstrates that intensive lifestyle interventions are effective in the prevention of type 2 diabetes,[5] so the diagnosis of GDM provides an opportunity for early intervention in an at risk group. Despite this, there is some evidence to suggest that women diagnosed with GDM have postpartum lifestyle behaviours that are not consistent with guidelines for prevention of type 2 diabetes, including suboptimal physical activity levels,[6,7] poor intakes of fruit and vegetables and high fat diets.[8,9,10] However, to date there has been little published data on the postpartum dietary intakes of Australian women with prior GDM.

Recent studies examining whole diets, as opposed to single nutrients or dietary components, have highlighted the important role of dietary patterns and overall diet quality in the prevention of type 2 diabetes.[11,12,13,14] Healthful dietary patterns characterised by high consumption of fruit and vegetables, whole grains, fish, and poultry may delay the progression to type 2 diabetes,[13,15] while Western dietary patterns have been demonstrated to increase risk.[16] Likewise a variety of diet quality tools which

measure adherence to dietary guidelines have demonstrated that a high diet quality, representing alignment with national dietary guidelines, is inversely associated with obesity, blood lipids, hyperglycaemia and hyperinsulinaemia, as well as all-cause mortality and indices of self-rated health.[17,18] In prospective studies, overall diet quality has also been inversely associated with type 2 diabetes risk in women, independent of BMI.[19] Diet quality may therefore play an important role in mediating the development of chronic disease in a group known to be at high risk of type 2 diabetes.

The aim of this study was to describe the diet quality of a national sample of Australian women with a recent history of GDM and determine factors associated with adherence to national dietary recommendations.

Materials and methods

This was a cross-sectional study of Australian women with a recent history of GDM. Participants were recruited from the National Diabetes Service Scheme (NDSS) database. The NDSS is an initiative of the Australian Government that provides subsidised blood glucose testing strips and free syringes to residents diagnosed with diabetes. Registrants also have the option of nominating whether or not they consent to being contacted for research purposes. Study inclusion criteria were: diagnosed with GDM ≤3 years previously, registered with the NDSS and consented to be contacted for research purposes. Women were excluded if they were aged <18 years at time of registration. Eligible women were invited to participate by mail. Additional women were recruited from two major maternity clinics in Brisbane, Australia. Women from the clinics were

pregnant at time of recruitment, but surveyed 6-months postpartum. This additional sampling was to recruit women with very recent GDM, who may be missed in the NDSS database due to status update delay. The University of Newcastle Human Research Ethics Committee, The University of Queensland, Royal Brisbane Women's Hospital and Mater Health Services approved the study and Diabetes Australia Ltd. approved the NDSS database search.

Survey design

The survey was administered by two methods. Firstly, a self-administered written questionnaire and secondly a telephone interview conducted in parallel by trained interviewers using Computer-Assisted-Telephone-Interviewing for Windows (WinCati, Version 4.2) full details of which have been described elsewhere.[6,20] Briefly, the survey questions addressed demographics, educational attainment, language spoken at home and occupation using standard items from the 2001 Australian census.[21] Information regarding GDM management, lifestyle related risk factors, family and medical history and postpartum follow-up were collected by self-report. Data on respondent's height and pre and postpartum weight were self-reported and used to calculate body mass index (BMI) as weight (kg)/height $(m)^2$. Physical activity was assessed using the validated Active Australia Questionnaire (AAQ) which involves recall of frequency and duration of physical activity in the past week. The AAQ is a widely used reliable and valid measure of physical activity.[22,23] Physical activity levels were defined according to AAQ criteria,[24] whereby 'sufficient' physical activity was defined as the accumulation of at least 150 min of moderate or equivalent weighted vigorous activity over at least five

sessions in the past week. Physical activity over-reporters were re-coded according to AAQ guidelines.[24] The self-administered questionnaire was pilot tested with a convenience sample of women (n=23) from the Diabetes Australia-NSW membership database. The telephone questionnaire was pilot tested with six women who had a recent GDM (<3 years) pregnancy using a snowball sampling method.

Australian Recommended Food Score

Diet quality was assessed using the Australian Recommended Food Score (ARFS). The ARFS is a diet quality score modelled on the Recommended Food Score developed by Kant and Thompson[25] and derived from the Victorian Cancer Council's Dietary Questionnaire for Epidemiological Studies (DQES) food frequency questionnaire (FFQ).[26] The DQES was originally developed for use in an ethnically diverse cohort,[26] and has been validated against 7 day weighed food records in young Australian women and found to an accurate estimate of usual dietary intake .[27] The ARFS is an index of dietary variety and nutritional quality with higher scores reflecting greater adherence to the Dietary Guidelines for Australians[28] and food variety within core food groups of the Australian Guide to Healthy Eating.[29] It has been validated in a nationally representative sample of Australian women, [18] with a higher ARFS associated with a lower percentage of energy from total and saturated fat, a higher percentage of energy from carbohydrates and protein, and higher intakes of micronutrients.[18]

The ARFS requires respondents to report their usual consumption of foods over the preceding 12 months. It includes nine questions regarding frequency of consumption of

core foods and details of usual food choices within each group. These questions are closed ended with multiple response categories. This is followed by a 48 item FFQ with dichotomised response categories. The FFQ includes only foods from the original DQES FFQ that make a healthful contribution to dietary intake. The ARFS scoring is mostly independent of reported quantities of food, rather is based on frequency of consumption of core food items. Items from the 48 question FFQ consumed less than once a week scored zero and those consumed once a week or more scored one. An additional score of one was allocated for each of the following: consuming two or more fruit serves per day, four or more vegetables per day, the use of reduced fat or skim milk or soy milk, consuming at least 500mL of milk per day, using high fibre, wholemeal, rye or multigrain breads, consuming at least four slices of bread per day, using polyunsaturated or monounsaturated spreads or no fat spread, having one or two eggs per week, using ricotta or cottage cheese and using low fat cheese, consuming ice cream and cheese each less than once a week, yoghurt more than once a week. Frequency of alcohol consumption between 1-2 days/month and 4 days per week was allocated one point and one point was allocated for quantity of between one or two standard drinks. Zero points were added for alcohol consumed outside of these ranges. Further details are provided in Table 1. The maximum ARFS which indicates greater adherence to the recommendations in both the Dietary Guidelines for Australians and the AGHE is 74.

For analysis, ARFS was divided into quintiles to create a categorical variable with quintile one representing the lowest category of dietary quality and quintile five the highest dietary quality. Those with more than four missing items were excluded from

analysis and missing values were re-coded as zero for those with up to four items missing.

Statistical analysis

To correct for potential sampling bias, descriptive statistics, ARFS and component scores were adjusted for age, country of birth, state of residence and insulin usage using weights from 15880 women with complete data in the NDSS dataset. Unweighted analyses were used to examine the predictors of ARFS. Univariate chi-square analyses were performed to determine variables associated with ARFS quintiles. Statistically significant variables ($p \leq 0.05$), as well as age and BMI, were included in a multiple variable multinominal logistic regression analysis. Likelihood ratio tests were used to assess significance of effects in the logistic regression model and used as the basis for retaining a variable in the model. The Pearson Chi-Square was used to check the goodness of fit of the model. The multiple variable model provides OR estimates adjusted for other variables in the model. Odds ratios for quintiles 2 to 5 were referenced to quintile 1 and 95% confidence intervals were calculated for each of these quintiles. Analyses were completed using SPSS version 18.0 (IBM Corp., Somers, NY, USA).

Results

Of the 15893 women registered on the NDSS with gestational diabetes, invitations were sent to 5147 women who met the inclusion criteria, with 302 women unable to be contacted. Of those invited, 1736 women consented to participate (36% response rate). Ineligible respondents who were currently pregnant (n=189), diagnosed with other forms

of diabetes (n=9) or those with missing demographic data required for sample weighting (n=39) were excluded from analyses. Final data were available for 1499 respondents.

Using weighted data the mean age ± SD was 34.2±5.1. Approximately two thirds were Australian born (64.5%) or currently employed (67.4%). Less than half (40.1%) were tertiary educated, 22.6% spoke a language other than English, and 1.7% were from an Aboriginal or Torres Strait Islander background. A previous diagnosis of GDM (prior to the index pregnancy) was reported by 13.1% of respondents, 25.7% used insulin during the index pregnancy, 29.0% were overweight and 26.3% were obese with a mean (±SD) self-reported BMI of 27.1±6.5.

The ARFS was calculated for 1447 women (52 women had more than four missing items, so were excluded from the analyses). Mean (±SD) diet quality score was 30.9±8.1 from a possible maximum score of 74. Subscale component scores are reported in Table 1 and demonstrate that the meat, alcohol and vegetable components were the most highly scored groups relative to the other components with nuts/legumes, grains and fruits the most poorly scored. f

Table 2 reports the demographic characteristics, health seeking behaviours and diabetes related risk factors of women with GDM by ARFS quintile. Independent variables found to be significant ($P \leq 0.05$) in univariate analyses included region of birth, speaking only English, being tertiary educated, returning for postpartum follow-up blood glucose (BG) testing, being sufficiently physically active and receiving risk reduction advice from a health professional. When these variables (as well as age and BMI) were included in

multinominal logistic regression analyses, they remained significant, with the exception of region of birth which was excluded from the final model, see Table 3. The Pearson Chi-Square was not significant (ChiSq(5116)=5116, p=0.499) indicating a satisfactory fit of the model to the data.

Table 3 contains all the significant effects in the multiple variable multinomial logistic regression model expressed as odds ratios (OR) and 95% confidence intervals for ARFS quintiles 2 to 5, using the lowest quintile as the reference group for each OR. The reference groups for the categorical explanatory variables are indicated by OR's = 1. Interpretation of the effects is similar for all variables in the model as they have a positive relationship with dietary score. The relative impact of the six significant factors can be assessed by comparing the OR's for ARFS quintile 5. Factors associated with being in the highest compared with the lowest ARFS quintile included age (OR 5 year increase =1.40; 95% CI:1.16-1.68), tertiary education (OR=2.19; 95% CI:1.52-3.17), speaking only English (OR=1.92; 95% CI:1.19-3.08), being sufficiently physically active (OR=2.11; 95% CI:1.46-3.05), returning for postpartum blood glucose testing (OR=1.75; 95% CI:1.23-2.50) and receiving risk reduction advice from a health professional (OR=1.80; 95% CI:1.24-2.60). There was a trend such that as BMI increased women were less likely to be in the highest compared with the lowest ARFS quintile (reference group). However this failed to reach significance in the likelihood ratio test (p=0.078) and was excluded from the final model. Table 3 also provides OR estimates for the other three quintiles of diet quality to show the overall pattern across quintiles.

Discussion

This is the first Australian study to date investigating diet quality in a national sample of women with a history of GDM. Despite their increased risk of developing type 2 diabetes, women in this study had an overall poor diet quality as measured by the ARFS, indicating suboptimal intakes of key food groups and eating patterns not aligned with national guidelines.[28] These findings are consistent with research done with representative samples of young and mid-aged Australian women whereby poor diet quality and disparities between national food group recommendations and dietary intakes have been reported.[18,30,31]

Analysis by component sub-scores indicated that nuts/legumes, fruit and grains were the food groups most poorly scored by women with previous GDM. To achieve a higher score in these food categories women would need to consume a variety of high fibre and wholegrain breads and cereals, legumes and increase the amount and variety of fruit consumed each week. Despite an already elevated risk of type 2 diabetes in this group, it is plausible that poor diet quality as found in this study, may further increase their risk for longer term chronic disease risk including both type 2 diabetes[14,32,33] and cardiovascular disease.[34] This highlights a need to target specific dietary changes for women with previous GDM to prevent subsequent chronic disease.

Consistent with other studies, we found that tertiary educated[35] and older women had better diet quality. These results are consistent with the findings of Collins et al (2008) who found the same relationship in a nationally representative sample of mid-aged Australian women.[18] In the current study we also found that those who spoke only

English were almost twice as likely to have an ARFS in the upper quintile after adjustment for education and other significant variables, indicating that language or cultural barriers influence an individual's ability to achieve a high quality diet. Considering that the risk of developing GDM in Australia is greater among women from non-English speaking backgrounds,[2,36] this is an important finding and indicates that this group may require additional support and/or targeted interventions.

As may be expected, the current study confirms that women who practise other preventative health behaviours are more likely to report better quality dietary intakes. In the present study, women who met the guidelines for physical activity were more than twice as likely to be in the upper compared to the lower quintile for diet quality. Women who sought postpartum testing for diabetes also reported better diet quality. While previous studies have shown low rates of postpartum testing for diabetes following a GDM pregnancy,[37,38,39] this finding suggests that either they are the more motivated group to improve their lifestyle following GDM or that being advised to return for follow-up acts as a motivating factor for improved diet quality.

The finding that women who received risk reduction advice from a health professional were more likely to have better diet quality highlights the importance of providing lifestyle interventions targeting postpartum risk reduction. Despite this, we have previously demonstrated poor follow-up and limited provision of postpartum dietary advice for this high-risk group.[41] With diabetes prevention studies providing evidence of the benefit of intensive lifestyle interventions for reducing the incidence of type 2

283 diabetes in those at highest risk,[42,43,44] these results support the need for additional
284 resources to address postpartum lifestyle management.
285
286 The association between BMI and diet quality has been reported in previous studies. [45,46]
287 Although we found a trend towards women with a lower BMI having better diet quality,
288 these results did not reach statistical significance in logistic regression analysis.
289 Postpartum weight retention may have confounded this relationship between weight and
290 diet quality. The use of self-reported weight may also have biased BMI calculations.
291 Studies using postal survey methodology have demonstrated that self-report
292 underestimates weight in women by an average of 0.95kg, with those in overweight and
293 obese categories underestimating by up to 2.5kg.[47] With both body weight and dietary
294 patterns being important determinants of type 2 diabetes risk,[19] this trend warrants further
295 investigation in particular with women with a longer postpartum duration.
296
297 This study has several limitations; most notable is the low (36%) response rate. It is also
298 possible that a response bias towards potentially more health conscious women may
299 present an optimistic assessment of postpartum diet quality. As with any tool used to
300 measure dietary intake, the ARFS has a number of limitations. Respondents are asked to
301 report their usual consumption of foods over the preceding 12 months, therefore results
302 may be influenced by the season in which the questionnaire was administered or be more
303 likely to emphasise recently consumed foods. It is possible that our findings are also
304 influenced by under or over-reporting. However, as the ARFS focuses on frequency of
305 consumption of core foods and the variety of food choices within those groups, the

scoring is independent of reported amounts of food items which would have limited the associated measurement error. Further, we did not collect longitudinal data to determine associations between diet quality and long-term chronic disease risk. Despite these limitations, our study did have a large sample size drawn from a population-based registry as opposed to a hospital or insurance-based data set, strengthening the applicability of the study to a larger population of women with prior GDM.

Conclusion

Women with previous GDM should be targeted for dietary interventions aimed at improving overall diet quality in the postpartum period. In particular, barriers to healthy eating may need to be addressed in those at highest risk of poor diet quality including younger women, those with a lower level of education, women who speak a language other than English and those who do not seek postpartum follow-up. Our study suggests that health professionals could play an important role in providing postpartum risk reduction advice which may improve overall diet quality, and further research is needed to assess the impact of health professional advice on preventative behaviours and subsequent chronic disease risk among women with GDM. A systematic approach to follow-up is urgently needed to ensure that all women diagnosed with GDM receive adequate information and support to achieve a diet consistent with the guidelines for chronic disease prevention.

Conflict of interest

The authors declare no conflict of interest.

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Table 1: The Australian Recommended Food Score (ARFS): Scoring method, component scores (mean and standard deviation (SD)) and total ARFS for women with previous GDM

Food Group	Items allocated one point	Maximum Score	Mean	SD
Vegetables	≥4 vegetables/day; potatoes; tomato sauce/paste/dried; tomatoes fresh/canned; capsicum; lettuce/endive/salad greens; cucumber; celery; beetroot; carrots; cabbage/brussels sprouts; cauliflower; broccoli; silverbeet/spinach; peas; green beans; bean/alfalfa sprouts; pumpkin; onions/leeks; garlic; mushrooms; zucchini	22	11.7	4.4
Fruit	≥2 serves fruit/day; ≥1/week of each fruit or vegetable juice; canned or frozen fruit; oranges or other citrus; apples; pears; bananas; melons; pineapple; strawberries; apricots; peach/nectarine; mango/pawpaw; avocado	14	4.8	3.1
Grains	≥4 slices bread/day; ≥1/week of each bread type – white high fibre; wholemeal; rye; multigrain; wholemeal; ≥1/week Allbran; Sultana Bran/Fibre Plus/Branflakes; Weet-Bix/VitaBrits/Weeties; rice; pasta/noodles; vegemite/marmite/promite; porridge; muesli; Cornflakes/Nutrigrain/Special K;	14	4.3	1.7
Dairy	>500ml milk/day; reduced fat or skim; ≤1/week cheese, ice cream; ≥ 1 week yoghurt; ricotta/ cottage cheese; low fat cheese	7	2.7	1.1
Nuts/legumes	Nuts; peanut butter; ≥1/week of each baked beans; soy beans/tofu; soya milk; other beans (chickpeas, lentils)	7	1.7	1.1
Meat, eggs, poultry	1-4/week of beef; veal; lamb; pork; chicken; up to 2 eggs/week	5	2.8	1.2
Fish	1-4/week of fish (steamed, baked, grilled); canned fish (salmon, tuna, sardines)	2	1.0	0.8
Fats	Use polyunsaturated/monounsaturated spread or nil margarine	1	0.5	0.5
Alcohol	<1/month up to 4 days/week beer/wine/spirits; maximum/day 1-2 standard drinks	2	1.1	0.8
Total ARFS		**74**	**30.9**	**8.1**

Table 2: Percentage (%) of Women in Each Quintile of the Australian Recommended Food Score (ARFS) by demographic characteristics, health seeking behaviours and diabetes related risk factors

		Quintiles of ARFS 1=lowest, 5= highest (ARFS score)					
	Unweighted Mean±SD ARFS	1 (≤24) n=312	2 (25-29) n=304	3 (30-33) n=256	4 (34-38) n=321	5 (39+) n=254	$\chi 2$
- `		%	%	%	%	%	
	31.1±8.0	20.6	22.0	18.9	21.5	17.0	$\chi 2$ (20) =30.32, p=0.07*
	29.7±9.0	31.3	17.4	16.7	16.7	18.1	
	33.0±6.9	10.2	22.0	15.3	35.6	16.9	
	31.4±8.5	24.1	18.0	12.8	24.8	20.3	
	29.0±9.3	35.0	20.0	5.0	20.0	20.0	
	33.1±7.8	14.6	17.1	17.1	31.7	19.5	
Language							
- English only	31.3±8.1	19.7	21.7	18.4	22.4	17.9	$\chi 2$ (4) =14.38, p=0.006*
- Other	30.1±8.5	30.6	17.5	14.4	21.4	16.2	
Tertiary educated							
- Yes	32.3±7.8	16.0	21.0	17.2	24.6	21.2	$\chi 2$ (4) =22.22, p <0.001*
- No	30.3±8.3	25.0	21.0	18.0	20.6	15.3	
Employed							
- Yes	31.3±8.1	20.6	21.0	18.2	22.7	17.5	$\chi 2$ (4) =1.91, p=0.75
- No	30.8±8.3	23.5	21.0	16.8	21.2	17.5	
Insulin requiring							
- Yes	31.1±7.9	22.3	21.6	18.0	19.2	18.9	$\chi 2$ (4) =3.29, p =0.51
- No	31.0±8.7	21.3	20.8	17.6	23.4	17.0	
Previous GDM							
- Yes	31.0±8.1	19.2	17.7	19.2	25.1	18.7	$\chi 2$ (4) =3.29, p =0.51
- No	31.7±8.2	22.0	21.6	17.5	21.7	17.3	
Return for follow-up BGL							
- Yes	31.9±8.4	18.5	20.5	17.5	23.3	20.2	$\chi 2$ (4) =13.52, p=0.009*
- No	30.3±7.8	24.7	21.5	17.9	21.1	14.8	
Sufficiently active							
- Yes	32.6±8.1	16.6	18.4	18.2	24.2	22.8	$\chi 2$ (4) =23.64, p<0.001*
- No	30.4±8.1	23.7	22.9	17.6	20.9	14.9	
Risk reduction advice							
- Yes	31.7±8.0	19.4	21.0	16.9	23.2	19.4	$\chi 2$ (4) =12.41, p=0.02*
- No	30.0±8.3	25.3	20.9	19.1	20.4	14.3	
Hyperlipidaemia							
- Yes	31.5±8.0	17.9	21.4	17.9	27.9	15.0	$\chi 2$ (4) =3.83, p=0.43
- No	31.1±8.2	22.0	21.0	17.7	21.6	17.8	
Hypertension							
- Yes	30.5±8.8	25.4	21.8	16.2	18.8	17.8	$\chi 2$ (4) =3.08, p=0.54
- No	31.2±8.1	21.0	20.9	17.9	22.7	17.5	
Type 2 diabetes							
- Yes	31.1±7.2	12.1	30.3	21.2	18.2	18.2	$\chi 2$ (4) =3.72, p=0.51
- No	30.1±8.2	21.8	20.8	17.6	22.3	17.5	

* *Statistically significant at p≤0.05*

Table 3: Effect sizes for the multinomial logistic regression model of variables associated with diet quality[^]

	Quintiles of ARFS 1=lowest[#], 5= highest (ARFS score)				
	Quintile 2 (25-29)	Quintile 3 (30-33)	Quintile 4 (34-38)	Quintile 5 (39+)	
	Adjusted OR 95%CI	*Adjusted OR 95%CI*	*Adjusted OR 95%CI*	*Adjusted OR 95%CI*	*p*[*]
Age (5 year increase)	0.91(0.77-1.08)	1.15(0.96-1.37)	1.29(1.09-1.53)	1.40(1.16-1.68)	<.001
Tertiary educated					
- **Yes**	1.74(1.22-2.47)	1.55(1.07-2.24)	1.93(1.36-2.74)	2.19(1.52-3.17)	<.001
- **No**	1	1	1	1	
Sufficiently active					
- **Yes**	1.12(0.78-1.61)	1.43(0.99-2.07)	1.60(1.12-2.27)	2.11(1.46-3.05)	<.001
- **No**	1	1	1	1	
Follow-up BG testing					
- **Yes**	1.24(0.89-1.72)	1.31(0.93-1.85)	1.44(1.03-1.99)	1.75(1.23-2.50)	.03
- **No**	1	1	1	1	
Language					
- **English only**	2.11(1.35-3.32)	2.10(1.30-3.38)	1.67(1.09-2.57)	1.92(1.19-3.08)	.005
- **Other**	1	1	1	1	
Risk reduction advice					
- **Yes**	1.31(0.93-1.83)	1.19(0.84-1.70)	1.55(1.10-2.18)	1.80(1.24-2.60)	.02
- **No**	1	1	1	1	

[^] *Diet quality was the response variable in the model and was measured using ARFS quintiles, the significant effects related to diet quality are the six variables listed in the table.*

[#] *Quintile 1 is the reference group (scores ≤ 24)*

* *Significance of the effect of each variable by the Likelihood Ratio Test*