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Current dietetic practices of obesity management in Saudi Arabia and comparison with Australian practices and best practice criteria

Abstract

Objective: To describe the dietetic practices of the treatment of obesity in Saudi Arabia and compare this with best practice criteria and the practice in Australia. **Methods:** Anonymous questionnaires were completed by dietitians in Saudi Arabia. The topics included barriers to obesity management, demand and level of service and strategies and approaches used for weight management. Best practice scores were based on those used to assess Australian dietitians. **Results:** 253 dietitians participated in the survey. Of these, 175 (69 %) were involved in the management of obesity. The best practice score for Australian dietitians was slightly but significantly greater than the scores of Saudi dietitians (mean 41.6 vs 38.8; $p < 0.001$), (median 43 vs 39). There was also a significant correlation between the best practice score and years of experience ($r = 0.26$, $p < 0.001$). The most common assessment approaches were assessment of BMI (87%) and exercise habits (81%) while the most common strategies for obesity management were; dietary total fat reduction (92%) and increase incidental daily activity (92%). The major barrier for establishment of a weight management clinic reported by 49% of participants was inadequate resources. **Conclusion:** Saudi Arabian dietetic practice for the management of obesity does incorporate most best practice recommendations, but some specific elements are rarely used.

Keywords

dietetic survey, dietitian, obesity, Saudi Arabia

Disciplines

Arts and Humanities | Dietetics and Clinical Nutrition | Life Sciences | Medicine and Health Sciences | Social and Behavioral Sciences

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Introduction

Obesity has become a global epidemic and the prevalence of both overweight and obesity is still increasing in Saudi Arabia.¹⁻⁵ The latest survey conducted between 1995-2000 to study cardiovascular disease and its risk factors involved 17,232 male and female Saudi subjects aged 30-70 years.³ Results showed that the overall obesity prevalence (BMI > 30 kg/m²) was 35.6%. The prevalence of overweight (BMI: 25-30 kg/m²) was 36.9%, which makes 72.5% of Saudi population either overweight or obese.

It is well established that obesity is directly or indirectly associated with several diseases including type II diabetes, hypertension, dyslipidemia, coronary heart disease, stroke, gall bladder diseases, osteoarthritis, sleep apnoea and respiratory problems, and some type of cancer.⁶⁻⁷ Therefore, obesity is a condition with significant economic costs and one that causes a great loss of quality of life. In Saudi Arabia, obesity has become a major cause of coronary artery diseases in the recent decades,⁵ apparently due to the sudden change in life style as a result of economic development, urbanization, and the tremendous increase in the socio-economic fortunes which has resulted in dietary changes and an increasingly sedentary life.⁸

It is important that dietitians, as one of the major health professionals involved in obesity management, know the most effective approaches and strategies for the treatment of overweight and obesity. Dietitians are considered to be the most effective providers of weight management advice.⁹ In Saudi Arabia, dietetics is a relatively new profession and little published data is available about the practice of dietetics. There is only one university that trains clinical dietitians (King Saud University). At present there are no national obesity practice guidelines developed for use by doctors, dietitians or other health professionals. To

address this issue, we have planned a larger project to develop clinical practice guidelines to be used by dietitians in Saudi Arabia.

This study aimed to describe the current dietetic practices for the treatment of obesity in Saudi Arabia and compare this with practice in Australia. It also aimed to provide baseline information to assist in the development and evaluation of the proposed new practice guidelines.

Methods:***Subjects:***

All dietitians in Saudi Arabia were invited to participate in the survey during the period from January to June 2007.

Recruitment and distribution:

Because no complete lists of dietitians in Saudi Arabia are available, dietitians were recruited primarily by contacting employer organizations and asking for the survey to be promoted to all dietitians on staff. Both urban and rural areas were covered in the survey. The survey was designed to be available in a web-based form in addition to a paper-based version.

Survey development:

To assist in developing the survey, a qualitative interview with 6 key stakeholders from different hospitals and universities was conducted over the phone, including academic staff, physicians, and expert dietitians in the area of obesity management.

Based on a review of the literature and suggestions received from participants of the qualitative interviews, a pilot questionnaire was developed in both Arabic and English languages. Some questions were drawn from previous similar surveys – such as those used by Campbell & Crawford and Collins in surveys of Australian dietitians, to enable comparison of obesity management in Saudi with Australia.^{10, 11} Thirty pilot questionnaires were distributed to dietitians with known expertise in obesity management. Twenty one responses were received along with comments on the pilot questionnaire for scope, length, clarity, and suitability. Copies of the final version of the survey are available from the first author (AA). Translation was performed by AA and reviewed for accuracy by two academic staff from the

English department in King Saud University, Saudi Arabia. All participants who completed at least the first two sections in the questionnaire were included in the survey.

The study was approved by the Human Research Ethics Committee (University of Wollongong / Illawarra area health services, Australia) and permission to distribute the survey in Saudi Arabia by King Saud University staff was obtained based on the Australian ethics approval. All participants received a cover letter with participant information and consent implied by return of the questionnaire.

Survey format

The survey contained 36 questions which were divided into five sections.

Section one:

Respondents provided demographic and professional information as shown in Table 1.

Section two:

This section consists of questions concerning barriers that prevent dietitians being involved in obesity management such as referral issues (in which physicians or other health care professionals are not referring obese patients to dietitians), lack of dietitians (a workforce shortage, a funding shortage or both), or other resource barriers (such as inadequate access to space, scales, food modules, etc).

Section three:

Participants were asked to estimate the number of clients seen per week, report the source of referrals and resources available in their clinic, and whether the service had specific referral criteria and practice guidelines.

Section four:

This section consisted of questions concerning dietitians' approaches to obesity assessment. Using a five-point Likert scale (1 = never; 5 = usually), participants were asked how frequently they performed each of 22 assessment and service provision activities (Table 2). These questions were drawn from a 1997 survey by Campbell and Crawford¹⁰ in Australia with the addition of two questions related to assessment of educational level and calculation of Body Mass Index (BMI). For analysis purposes, the responses were collapsed into three categories (never/seldom; sometimes; often/usually).

Section five:

This section consisted of questions concerning dietitians' approaches to obesity management. Using the same five point scale, participants were asked how frequently they used each of 17 possible weight management activities (Table 3). These questions were drawn from the surveys by Campbell and Crawford and Collins with three additional questions.^{10, 11}

Data analysis

The survey was analysed by SPSS software (version 15.0; SPSS Inc., Chicago, IL).

The mean score of each weight management activity was calculated (Tables 2 and 3) with a maximum possible score of 2. Descriptive statistics were used to analyse the responses to each item and differences between scores of each item from the survey by Collins¹¹ and our findings were examined using Kruskal-Wallis test, as indicated for non-normal data. $P < 0.05$ was considered statistically significant.

A best practice score was calculated for each participant on the basis of the frequency with which they reported using 33 of the 39 recommended assessment management activities (Table 2 and 3). The six items that were not included in the score are those without

comparable data in the Collins survey and these are noted in the footnotes to Tables 2 and 3. Using scores of 'never' or 'seldom' = 0, 'sometimes' = 1, 'often' or 'usually' = 2, the maximum score that could be achieved from the 33 activities included in the calculation was 63. Three items in Table 2 were calculated as follows; 'never', 'seldom', 'often', 'usually' = 0; 'sometimes'=1. A one sample t-test was used to compare the mean best practice score for Saudi dietitians with the score of Australian dietitians. The differences between best practice scores and categories of years of dietetic experience or number of patients seen by dietitians were examined using one-way ANOVA, where applicable. Since the data are not normally distributed, both parametric and nonparametric methods were used and the results were identical.

Results:**Subjects:**

A total of 253 dietitians participated in the study. Of these, 175 (69 %) were involved in the management of overweight and obesity. Fifteen participants were excluded due to incomplete questionnaire responses. Table 1 contains demographic and employment characteristics of the sample population.

Barriers to obesity management:

Participants who reported that they did not have a nutrition clinic at their service (20%) were asked to list the barriers for establishment of a weight management clinic. Forty-nine percent reported that inadequate resources (space, tools, etc) was the major barrier, 40% reported that the service administration had not established a clinic yet, 25% reported referral issues and 23% reported lack of dietitians. Similarly, participants who did not provide consultations to hospital patients (19%) were asked to list the barriers. The majority (61%) reported that hospital policy did not require dietitians to manage obesity, 35% reported lack of dietitians, 27% reported referral related issues, and 22% reported resource problems.

Demand and level of service:

A total of 175 participants (69%) reported that they manage obese patients. None of these participants reported the use of local clinical practice guidelines for the management of overweight and obesity. However, sixty-one percent of participants who manage obesity reported that they use some international guidelines such as the American practice guidelines.¹²

Forty two percent of participants who manage obesity see 5-10 obese patients every week, with 25% managing 11-20 patients, followed by 21% with less than 5 patients every week. Only 11% manage more than 20 obese patients per week.

Seventy-seven percent of participants who manage obesity reported that they have basic scales in their services and 36% reported that they have scales that measure weight and body fat percentage. Sixty percent reported that they have food models in their clinics. Obesity services sometimes included other health professionals (52%). Of those, team members included a physician (92%), physiotherapist (38%), social worker (31%), and psychologist (27%).

Strategies and approaches for obesity assessment and dietary treatment:

Some questions were included about the assessment of energy intake. Most dietitians (86%) use the Harris Benedict equations to assess resting energy expenditure (REE) with 5% using World Health Organization equations, followed by 3% using Owen equations, 3% using Schofield equations, 1% using Mifflin equations and only 2% using other different equations. None of participants use Ireton-Jones equations or Bernstein equations.

Participants were also asked about other factors that they consider when they calculate the REE. For overweight patients ($BMI = 25-30 \text{ kg/m}^2$), 57% of participants indicated that they consider the Ideal Body Weight in calculating REE, 32% consider the Actual Body Weight, followed by 12% consider the Adjusted Body Weight. For obese patients ($BMI > 30 \text{ kg/m}^2$), 64% consider the Adjusted Body Weight, ¹² 22% consider the Ideal Body Weight and 14% consider the Actual Body Weight. Most participants (62%) also indicated that they reduce the daily energy requirements by 1255-2092 kJ (300-500 calories), 24% indicated that they reduce 2092-4184 kJ (500 – 1000 calories) a day and 14% indicated that they do not have any

specific plan. Twenty nine percent of participants reported that they do not have a specific time period to achieve their goals with 26% reporting that they achieve their goals from 3-6 months, 9% reported 1-3 months, 18% reported more than 6 months and 18% reported that they consider other factors such as patient readiness to lose weight and the amount of excess weight.

The approaches of the majority of services (94%) incorporated diet, exercise and behavior modification. None of the participants reported the use of diet only. Specific dietary strategies were selected for participants on the basis of dietitian experience (49%), based on a program prepared by the service with specific energy level (49%), patient preference (11%) or as requested by medical referral (15%). Tables 2 and 3 show comparison of the use of specific strategies for weight management by dietitians in Saudi Arabia in 2007 and Australia in 2002.

Best practice in weight management:

The Best Practice Score was calculated by adding together the scores from Table 2 and Table 3. The possible maximum score was 63. The median best practice score for all participants was 39. The best practice score for Australian dietitians was slightly but significantly greater than the scores of Saudi dietitians (mean 41.6 vs 38.8; $p < 0.001$), (median 43 vs 39). Using ANOVA there was a significant increase in the mean Best Practice Score as the years in practice increased (0-5 y = 35.0; 6-15 y = 39.7; > 15 y = 40.6; $F = 7.2$; $P < 0.001$). When the best practice score was analysed by the number of patients seen by dietitians, there was no significant association.

Discussion:

This is the first study to describe the current dietetic practice for the management of overweight and obesity in Saudi Arabia. There are few similar studies conducted anywhere worldwide and therefore published Australian practice has been used for comparison purposes.

Since there are no recent statistics on the number of dietitians in Saudi Arabia, we could not calculate the survey response rate. However, the majority of dietitians are employed in the Ministry of Health (MOH). Unpublished data from the MOH show that the number of dietitians in their hospitals was 218 in 2007. The number of survey participants from the MOH was 130, making the response rate of MOH dietitians 70%. The majority of participants (41%) were from the central area due to the large number of hospitals in this area. In contrast only 22 % of participants were from both Southern and Northern areas due to the limited number of hospitals in these areas. Since dietetics is a relatively a new profession in Saudi Arabia we found dietitians had less experience and were younger in comparison to dietitians in Australia.¹¹

This survey examined the barriers of obesity management in Saudi Arabia and it was surprising that 61% of dietitians who do not give nutritional consultation for hospital patients reported that hospital policy did not require dietitians to manage obesity. Also 49% of dietitians who do not have obesity clinic in their services reported that inadequate resources was the major barrier and 40% reported that the health administration had not established a clinic yet.

These findings indicate an urgent need for developing and implementing a clear policy explaining the importance and role of dietitians in the health services in Saudi Arabia and

finding ways to overcome the limited involvement of dietitians in managing obesity either with inpatients or in out patients' clinics. It seems too that more effort is required to develop policies and care pathways whereby physicians and other health professionals refer obese patients to dietitians more routinely, and the role of the multi-disciplinary team including dietitians and physicians in the management of obesity needs to be clearly identified.

The median best practice score for all dietitians was 39 (out of 63). Similar surveys reported on obesity management practices of Australian dietitians by Campbell and Crawford in 1997 and Collins in 2002 showed that scores were 46 and 43, respectively.^{10, 11} The best practice score for Australian dietitians was slightly but significantly greater than the scores of Saudi dietitians. This is likely to be due to the lesser experience of the Saudi dietitians. However, both scores were relatively low compared to the maximum total scores that could be achieved. There were significant differences in several activities between practices in Saudi Arabia and Australia (Table 2 and 3). Saudi dietitians do not place emphasis on the assessment of client's home environment or family weight nor do they routinely include significant others in the client consultation. This could be explained by the high values placed on the privacy of Saudi families.

As found in the Australian studies, the best practice score was positively correlated with the number of years practicing as a dietitian.^{10, 11} There was no significant correlation between the best practice score and the number of clients usually seen by the dietitian. As illustrated in Table 2 and 3, a large range of assessment approaches and strategies were employed with varying frequency. Most dietitians reported that they usually assess exercise habits, weight history, readiness for change, and see clients on a one-to-one basis. In contrast, most dietitians

reported that they seldom see clients in a group format or refer clients to another member of health care team. Most dietitians also reported that they usually advise client about behavior modification techniques in addition to diet and exercise, specifically dietary total fat reduction, advice to shopping, incidental daily activity and to eat fewer kilojoules. Several other approaches and strategies (Table 2 and 3) were employed with varying frequency among dietitians.

These findings indicate that Saudi dietetic practice does incorporate most of the best practice elements identified in the literature. However, approximately two thirds of dietitians reported relying on the use of international dietetic practice guidelines, which suggests the need for the establishment and endorsement of local obesity clinical practice guidelines similar to those developed in other countries such as the USA, Australia, Canada and Scotland.¹³⁻¹⁶

Approximately 86% of dietitians reported the use of Harris-Benedict equation in the assessment of energy requirements. Several validation studies have demonstrated that it overestimates energy requirements, particularly among overweight and obese people.^{17, 18} It was surprising that none of participants used either of those equations developed by Ireton-Jones *et al.* or Bernstein *et al.* which were derived from samples of obese subjects.^{19, 20} However, energy expenditure of the overweight and obese is variable, and the best method to predict it is still controversial. Also it is unclear whether prediction equations derived from one population can be applied in different populations. Several studies have shown that ethnicity, climate and genes have an influence on metabolic rate.²¹⁻²⁴ These findings support the need for further research to validate the use REE equations in the Saudi population and to examine factors that affect their accuracy. To address this deficit, we have commenced a project to validate the use of such equations with Saudi subjects.

Conclusion:

This study indicates that Saudi dietitians use a variety of approaches and strategies for obesity management and employ most of the recommended best practice elements. However, the development of local evidence-based practice guideline might assist in making the care more consistent and efficient. The findings also suggest that efforts are needed to improve the recognition of the value of weight management services and the role and needs of dietitians in Saudi Arabia needs to be clearly identified.

References:

1. Al-Hazzaa HM. Rising trends in BMI of Saudi adolescents: evidence from three national cross sectional studies. *Asia Pac J Clin Nutr* 2007;**16**:462-6.
2. Al-Othaimen AI, Al-Nozha M, Osman AK. Obesity: an emerging problem in Saudi Arabia. Analysis of data from the National Nutrition Survey. *East Mediter Health J* 2007;**13**:441-8.
3. Al-Nozha MM, Al-Mazrou YY, Al-Maatouq MA, Arafah MR, Khalil MZ, Khan NB, et al. Obesity in Saudi Arabia. *Saudi Med J* 2005;**26**:824-9.
4. Al-Nuaim AA, Bamgboye EA, Al-Rubeaan KA, Al-Mazrou Y. Overweight and obesity in Saudi Arabian adult population, role of socio-demographic variables. *J Community Health* 1997;**22**:211-23.
5. Osman AK, Al-Nozha MM. Risk factors of coronary artery disease in different regions of Saudi Arabia. *East Mediter Health J* 2000;**6**:465-74.
6. Hill JO, Melanson EL. Overview of the determinants of overweight and obesity: current evidence and research issues. *Med Sci Sports Exer* 1999;**31** (suppl 11):S515-21.
7. Monteiro CA, Conde WL, Popkin BM. Obesity in developing countries: biological and ecological factors-independent effects of income and education on the risk of obesity in the Brazilian adult population. *J Nutr* 2001;**131**:881-6.
8. Al-Hazzaa HM. Prevalence of physical inactivity in Saudi Arabia: a brief review. *East Mediter Health J* 2004;**10**:663-70
9. Paxton S, Tighe C. Weight loss referral practices and recommendations of general practitioners. *Nutr Diet* 1994;**51**:82-7.
10. Campbell K, Crawford D. Management of obesity: attitudes and practices of Australian dietitians. *Int J Obes Relat Metab Disord* 2000;**24**:701-10.
11. Collins C. Survey of dietetic management of overweight and obesity and comparison with best practice criteria. *Nutr Diet* 2003;**60**:177-84.
12. Krenitsky J. Adjusted body weight, pro: evidence to support the use of adjusted body weight in calculating calorie requirements. *Nutr Clin Pract* 2005;**20**:468-73.
13. American Dietetic Association. Adult Weight Management Evidence Based Nutrition Practice Guideline, 2007. Available from: <http://www.adaevidencelibrary.com/topic.cfm?cat=2798>. Access date: 20 November 2007.
14. National Health and Medical Research Council. Clinical practice guidelines for the management of overweight and obesity in adults. Canberra: NHMRC, 2003. Available from: [http://www.health.gov.au/internet/wcms/publishing.nsf/Content/obesityguidelines-guidelines-adults.htm/\\$FILE/adults.pdf](http://www.health.gov.au/internet/wcms/publishing.nsf/Content/obesityguidelines-guidelines-adults.htm/$FILE/adults.pdf). Access date: 20 November 2007.
15. Lau DCW, Douketis JD, Morrison KM, Haramiak IM, Sharma AM, Ur E. Obesity Canada Clinical Practice Guidelines Expert Panel. 2006 Canadian clinical practice guidelines on the management and prevention of obesity in adults and children [summary]. *CMAJ* 2007;**176**(8 Suppl):S1-13. [For the complete set of guidelines, go to www.cmaj.ca/cgi/content/full/176/8/S1/DC1].
16. Scottish Intercollegiate Guidelines Network. Management of obesity in children and young people. Scotland, 2003 Publ. No. 1899893431. Available from: <http://www.sign.ac.uk/guidelines/fulltext/69/index.html>. Access date: 20 November 2007.
17. Harris JA, Benedict FG. A Biometrie Study of Basal Metabolism in Man. Washington, DC: Carnegie Institute; 1919. Publication No. 279.

18. Ireton-Jones C. Adjusted body weight, Con: why adjust body weight in energy-expenditure calculations? *Nutr Clin Pract* 2005;**20**:474-9.
19. Ireton-Jones C. Clinical dilemma: which energy expenditure equation to use? *J Parenter Enter Nutr* 2004;**28**:282-3.
20. Bernstein RS, Thornton JC, Yang M-U, Wang J, Redmond A, Pierson RN, *et al.* Prediction of resting metabolic rate in obese patients. *Am J Clin Nutr* 1983;**37**:595-602.
21. Leung R, Woo J, Chan D, Tang N. Validation of predictions equations for basal metabolic rate in Chinese subjects. *Eur J Clin Nutr* 2000;**54**:551-4
22. Foster G, Wadden T, Vogt R. Resting energy expenditure in obese african-american and caucasian women. *Obes Res* 1997;**5**:1-8.
23. Henry C, Rees D. New predictive equations for the estimation of basal metabolic rate in tropical peoples. *Eur J Clin Nutr* 1991;**45**:177-85.
24. Comuzzie A, Allison D. The search for human obesity genes. *Science* 1998;**280**:1374-7.

Table 1. Demographic profile of survey respondents (n=253)

	Percentage of surveyed participants
Age (y)	
21-35	79
36-45	16
46- 55	5
Gender	
Male	34
Female	66
Sector of employment	
Hospitals of Ministry of Health	55
Other hospitals	37
Weight reduction centre or clinic	6
Academia	6
Other sectors	4
Professional qualifications	
Bachelor in Clinical Nutrition	50
Bachelor in Food and Nutrition	31
Master degree	10
PhD degree	3
Other	6
Years in Practice	
0- 5 years	65
6 – 15 years	27
> 15 years	8

Table 2. Comparison of the assessment approaches and service provision for weight management by dietitians in Saudi Arabia in 2007 and Australia in 2002.¹¹

Strategy	Saudi Arabia			Australia ¹¹	
	Never Seldom (%) n = 175	Some-times (%) n = 175	Often usually (%) n = 175	Score (Mean ± SD) [†] ‡ n= 172	Score (Mean ± SD) [†] ‡ n = 254
Assessment of exercise habits	1	18	81	1.80±0.43	2.00±0.00*
Assessment of weight history	4	27	69	1.65±0.56	1.97±0.27*
See client on one to one basis [§]	6	19	75	0.19±0.39	0.07±0.26*
Assessment of readiness for change	7	34	59	1.52±0.62	1.80±0.49*
Assessment of client's expectations of weight loss/ management	5	44	51	1.46±0.59	1.85±0.44*
Assessment of client's values and beliefs regarding the ability to lose weight	10	37	53	1.43±0.67	1.72±0.59*
Assessment of home environment for supportive structure of weight management/loss	9	47	44	1.35±0.64	1.74±0.58*
Assessment of the client's definition of successful outcomes in weight management	9	43	48	1.39±0.65	1.61±0.65*
Assessment of the weight history of the client's family	23	51	26	1.03±0.70	1.27±0.73*
Assessment of the clients preferred style of consultation/ method of intervention	18	43	39	1.21±0.73	1.34±0.80
Assessment of client's progress for more than 6 month	11	39	49	1.37±0.68	1.24±0.77
Offering more than one weight management strategy	17	46	37	1.20±0.71	1.31±0.72
Accompanied by significant other	19	52	29	1.10±0.69	1.34±0.72*
Assessment of expected number of consultations clients need with you	28	41	31	1.03±0.77	1.08±0.84
Assessment of client's anticipation of regaining weight loss	19	48	33	1.14±0.71	1.18±0.79
Providing preventive advice to individuals and families	14	37	49	1.35±0.72	NA ^{††}
Referral to another member of health care team	42	46	12	0.70±0.67	0.96±0.68*
See client in group format [§]	73	25	2	0.25±0.43	0.23±0.42
See client in combined one to one counseling/group format [§]	61	29	10	0.29±0.46	0.16±0.37*
Review client's progress more than two years.	49	39	13	0.65±0.70	0.48±0.69*
Calculation of BMI [¶]	2	11	87	1.85±0.42	NA ^{††}
Assessment of education level [¶]	15	65	21	1.06±0.55	NA ^{††}

[†] SD: Standard Deviation

[‡] Never/Seldom = 0; Sometimes = 1; Usually/often = 2

[§] Item was calculated as follows for the purpose of calculating the best practice score: 'never', 'seldom', 'often', 'usually' = 0; 'sometimes'=1. All other items were scored as follows: 'never' or 'seldom' = 0, 'sometimes' = 1, 'often' or 'usually' = 2

[¶] Item was not included in the calculation of best practice score

^{††} NA: Not available in survey by Collins and not included in the overall best practice score

* Significant differences ($P < 0.05$)

Table 3. Comparison of the use of recommended strategies for weight management used by dietitians in Saudi Arabia in 2007 and Australia in 2002. ¹¹

Strategy	Saudi Arabia			Australia ¹¹	
	Never Seldom (%) n=172	Sometimes (%) n=172	Often Usually (%) n=172	Score (Mean ± SD) [‡] n= 172	Score (Mean ± SD) [‡] n = 262
General advice to do more exercise [§]	0	8	92	1.00±0.00	1.02±0.01
Pedometer or other exercise monitoring device [¶]	37	38	25	0.88±0.78	NA ^{††}
Practical advice regarding shopping and cooking to achieve dietary goals	6	30	64	1.58±0.60	1.93±0.30*
Specific advice regarding opportunities for increasing incidental daily activity	3	27	69	1.65±0.53	1.92±0.32*
Specific advice to reduce total fat intake	1	7	92	1.91±0.32	1.90±0.36
Specific advice re incorporating low intensity, long duration exercise such as walking into present lifestyle	1	14	85	1.84±0.40	1.89±0.37
Planning for follow up in the short term	8	31	62	1.55±0.64	1.81±0.48*
Specific advice regarding ways of incorporating other forms of exercise into daily living	5	43	52	1.47±0.59	1.76±0.51*
Behavior modification techniques	1	25	74	1.73±0.47	1.68±0.59
Specific advice to eat fewer kilojoules [§]	2	24	73	1.00±0.13	1.30±0.45*
Keeping a food diary	24	52	24	1.00±0.69	1.18±0.77*
Planning for follow up in the long term	15	41	44	1.29±0.71	1.12±0.77*
Keeping a hunger awareness diary	43	37	20	0.77±0.76	0.68±0.74
Keeping a weight diary [¶]	23	42	35	1.12±0.76	0.31±0.64*
Joining of a commercial or community-based "slimming group" [¶]	41	36	23	0.82±0.78	0.42±0.62*
Advice to use medications [¶]	84	13	3	-	NA ^{††}
Surgical intervention [¶]	67	31	2	-	NA ^{††}

[†] SD: Standard Deviation

[‡] Never/Seldom = 0; Sometimes = 1; Usually/often = 2

[§] Item was calculated as follows for the purpose of calculating the best practice score: 'never' or 'seldom' = 2, 'sometimes' = 1, 'often' or 'usually' = 1. All other items were scored as follows: 'never' or 'seldom' = 0, 'sometimes' = 1, 'often' or 'usually' = 2

[¶] Item was not included in the calculation of best practice score

^{††} NA: Not available in the survey by Collins and not included in the overall best practice score

* Significant differences ($P < 0.05$)