Management of excess weight in Australian general practice patients:
Informing practice

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Citation
Agreement between self-reported and measured weight and height collected in general practice patients: a prospective study

Sze Lin Yoong1, Mariko Leanne Carey1, Catherine D'Este1,2 and Robert William Sanson-Fisher1

Abstract

Background: Self-reported weight and height is frequently used to quantify overweight and obesity, it is however, associated with limitations such as bias and poor agreement, which may be a result of social desirability or difficulties with recall. Methods to reduce these biases would improve the accuracy of assessment of overweight and obesity using patient self-report. The level of agreement between self-reported and measured weight and height has not been widely examined in general practice patients.

Methods: Consenting patients, presenting for care within four hour sessions, were randomly allocated to the informed or uninformed group. Participants were notified either a) prior to (informed group), or b) after (uninformed group) reporting their weight and height using a touchscreen computer questionnaire, that they would be measured. The differences in accuracy of self-report between the groups were examined by comparing mean differences, intraclass correlations (ICCs), Bland Altman plot with limits of agreement (LOAs) and Cohen's kappa. Overall agreement was assessed using similar statistical methods.

Results: Of consenting participants, 32% were aged between 18-39 years, 42% between 40-64 years and 25% were 65 years and above. The informed group (n = 172) did not report their weight and height more accurately than the uninformed group (n = 160). Mean differences between self-reported and measured weight (p = 0.4004), height (p = 0.5342) and body mass index (BMI) (p = 0.4469) were not statistically different between the informed and uninformed group. Overall, there were small mean differences (~1.2 kg for weight, 0.8 for height and ~0.8 kg/m² for BMI) and high ICCs (>0.9) between self-reported and measured values. A substantially high kappa (0.70) was obtained when using self-reported weight and height relative to measured values to quantify the proportion underweight, normal weight, overweight or obese. While the average bias of self-reported weight and height as estimates of the measured quantities is small, the LOAs indicate that substantial discrepancies occur at the individual level.

Conclusions: Informing patients that their weight and height would be measured did not improve accuracy of reporting. The use of self-reported weight and height for surveillance studies in this setting appears acceptable; however this measure needs to be interpreted with care when used for individual patients.

Keywords: Obesity, Family practice; Weight

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Background
Overweight and obesity affects a large proportion of the population in the developed world [1]. As the access point for health care systems in countries including Australia, Canada and United Kingdom, general practice is a valuable setting to target the reduction of overweight or obesity. GPs have access to a large proportion of the population, with 81% of Australians aged 15 years and above reporting having consulted their GP at least once a year [2]. Both GPs [3] and patients [4,5] perceive weight management to be part of a physician's role and those who are advised to lose weight by a health care provider are more likely to attempt to lose weight [6].

Self-reported weight and height is commonly used to assess overweight and obesity as it enables the body mass index (BMI) to be calculated. In the general practice setting, self-reported weight and height is often utilised in large-scale monitoring studies, where it may not be feasible to carry out weight and height measurements. For example, the largest ongoing study with general practice patients in Australia (the Bettering the Evaluation and Care of Health (BEACH)) uses self-reported weight and height to provide surveillance data on prevalence of overweight or obesity [7]. While self-report is a relatively cost-effective, practical and less invasive way of obtaining weight and height, this method of assessment is subject to a number of limitations such as bias or poor agreement, which may be a result of social desirability or difficulties with recall [8]. Previous population studies have reported that using self-reported weight and height frequently leads to an underestimation of overweight and obesity when compared to measured values [9,10]. Most studies examining the accuracy of self-report have however been conducted in the general population [9,11-13]. In order to utilise self-report for monitoring of overweight or obesity in this setting, the accuracy of self-reported weight and height in general practice patients' needs to be evaluated.

Simple strategies to improve self-reported weight and height could potentially be useful in helping improve surveillance of excess weight in general practice. One strategy that has been used to improve the reporting of socially undesirable behaviours is the Bogus pipeline method [14]. Using this method, respondents are given the impression that the accuracy of their responses will be independently checked. It is underpinned by the assumption that people are more likely to tell the truth when they think that their responses will be verified [15]. Black et al. tested the effectiveness of a variation of this method in improving accuracy of self-reported weight and height in volunteers in a shopping mall [16]. Participants in the intervention group were informed that their weight and height would be measured and then asked to report their weight and heights whilst those in the control group reported their weight and height before being told that they would be measured [16]. Participants in the intervention group reported their weight and height significantly more accurately than those in the control group. Despite its potential to improve accuracy of self-reported weight and height, no other study examining this intervention exists, to our knowledge.

This study therefore aimed to test whether advising general practice patients that their height and weight would be measured was effective in improving accuracy of self-report. It also aims to provide an index of reliability and agreement for self-reported weight and height in general practice patients, collected using a touchscreen computer, using mean differences, intraclass correlations (ICC) and Bland Altman plots with 95% limit of agreements (LOAs). The impact of self-report on categorization of underweight, normal weight, overweight and obesity was also assessed using Cohen's kappa. An additional aim was to determine whether mean difference in reporting of self-reported and measured weight, height and BMI varied by age category.

Methods
This study was conducted as part of a larger study testing the acceptability of using a touchscreen computer questionnaire in twelve general practices in Australia [2]. A subsample of patients from three practices was invited to participate in the current study. Consecutive patients aged 18 years and above, presenting for an appointment to their GP and able to provide informed consent were eligible to participate. Patients were not excluded based on the presence of other health conditions. Research staff recorded the sex of all invited patients in order to assess for consent bias. Participants were randomised to the informed or uninformed group and completed a touchscreen computer questionnaire. Participants' weight and height measurements were obtained after completion of the questionnaire.

Experimental groups
General practice sessions (4 hours) were centrally randomised by the researcher to the informed or uninformed group using a random number table. Participants recruited within the one session were all allocated to the same group. Neither practice staff nor patients were aware of group allocation.

Informed group
Participants' consent to have their weight and height measured was sought prior to commencement of the questionnaire. After consenting to have their measurements taken, participants provided their self-reported weight and height using the touchscreen questionnaire.
Uninformed group
Participants provided their self-reported height and weight as part of completion of the questionnaire. The research assistant asked for consent to obtain weight and height measurements after participants provided their self-reported weight and height.

Variables
Self-report
Participants were asked to provide demographic information including gender and whether they had a government concession health card. Patients were asked to select their age from the following categories: 1 = 18-24; 2 = 25-29; 3 = 30-34; 4 = 45-39; 5 = 40-44; 6 = 45-49; 7 = 50-54; 8 = 55-59; 9 = 60-64; 10 = 65-69; 11 = 70 and above. Participants also reported weight in either kilograms (kg) or stones/pounds and height in centimetres (cm) or feet/inches. All weight responses were converted to kg and height response converted to cm.

Measured
Participants' weight was obtained using a digital body fat and muscle weight scale and height measured with participants head in the Frankfort plane using a mounted stadiometer. Participants were asked to remove their shoes, any heavy outer garments and personal belongings prior to measurement. Weight was measured to the nearest 0.1 kg and height to the nearest 0.1 cm. A trained anthropometrist took patients' weight and height measurements twice. A third measurement was taken if there was more than a 1% variation between the first and second measurement.

Ethical approval
Ethical approval was provided by the University of Newcastle Human Research Ethics Committee (H2009-0341) and ratified by the University of New South Wales HREC (HREC 09/388/1 UN H-2009-0341) and Monash University HREC (2009001860).

Data analysis
STATA SE version 11.0 (StatCorp, College Station, Tex, USA) was used to perform all statistical analyses. Self-reported values of height larger than 210 cm and smaller than 120 cm and values of weight larger than 250 kg and less than 30 kg were coded as missing as these values were perceived to be errors in self-report. BMI was calculated from both self-reported and measured data using weight in kg divided by metres squared. Consent rates for physical measures were compared between the informed and uninformed groups. Differences between self-reported and measured values were obtained for weight, height and BMI. Mean differences, ICCs and corresponding 95% CIs for height, weight and BMI were tabulated separately for the informed and uninformed groups and compared between groups using student’s t-test for mean differences and by comparing 95% CIs for ICCs [17,18]. Bland Altman plots with 95% LOA for height, weight and BMI were generated for both groups. The Bland Altman test is a statistically robust method of assessing reliability and agreement [19]. Additionally, Cohen's kappa statistic and 95% CI for classification of underweight (BMI <18.5 kg/m²), normal weight (BMI ≥ 18.5 kg/m² and <25 kg/m²), overweight (BMI ≥ 25 kg/m² and <30 kg/m²) or obesity (BMI ≥ 30 kg/m²) was generated and compared between groups using 95% CIs. The overall level of agreement between self-reported and measured weight, height and BMI was also assessed. Mean differences between self-reported and measured values and corresponding standard deviations for males and females were reported. An ICC for the overall sample was calculated to provide an estimate of reliability. Cohen's kappa was calculated to provide the level of agreement between self-reported and measured classification of BMI categories. The degree of agreement between patient measured and self-reported overweight and obesity was assessed as follows: κ < 0 is none/poor; 0 ≤ κ ≤ 0.20 is slight; 0.21 ≤ κ ≤ 0.40 is fair; 0.41 ≤ κ ≤ 0.60 is moderate; 0.61 ≤ κ ≤ 0.80 is substantial; and 0.81 ≤ κ ≤ 1.0 is almost perfect [20]. Mean differences in self-reported weight and height were reported by age group. An ANOVA test was carried out to compare the mean difference in reporting by age (collapsed as 18-24, 25-44, 45-64 and ≥65 years).

Sample size calculation
An initial sample size calculation was calculated to detect a difference of 0.5 kg/m² in mean BMI between the two groups, with 80% power and 95% significance level, assuming a standard deviation of 1.5. To achieve this, a minimum of 142 participants needed to be recruited into each group (284 patients overall). A sample of this size would allow detection of a difference of 0.02 in mean ICCs between groups with 80% power at 5% significance, assuming a standard deviation of 0.5. For overall agreement, this number of patients would allow estimation of kappa with 95% confidence within ±0.01 for a kappa of 0.4 or higher [21]. This sample size would also allow us to detect an ICC of 0.7 or more as being significantly greater than 0.6 [22]. A sample size of approximately 300 (75 per age group) would have at least 80% power with 5% significance, to detect a difference in the variation between self-reported and measured weight, height and BMI of 0.6 standard deviations.

Results
Overall, 86% of patients consented to completing the questionnaire for the larger study. 365 patients were
asked if they were willing to have their weight and height measured and 93% (n = 332) consented. No significant differences in proportion of males and females who consented to and did not consent to being measured were identified (χ²: 1.1304, df = 1; p = 0.288). There was no significant difference in the proportion who consented to being measured between the informed (93%) and uninformed (92%) group (χ²: 0.0213, df = 1; p = 0.337).

Eleven participants reported having a height of more than 240 cm or less than 120 cm and/or having a weight of more than 250 kg or less than 30 kg. One participant in the uninformed group was excluded as the height difference tabulated was beyond reasonable error rate. More than half (56%) of consenting participants were female, 25% were aged 65 years and above and 42% had a government subsidised health care card. 14.2% of the Australian population are aged 65 years above [23]. While not directly comparable due to the inclusion of those aged below 18 in the latter population statistics, the current sample had a larger proportion of older people (>65 years) than would be expected in the general population. This larger proportion of older participants is consistent with that identified in other general practice datasets [7]. Demographic characteristics are presented for the informed (n = 172) and uninformed (n = 165) groups (see Table 1).

There were no significant differences in mean difference of self-reported and measured weight (p = 0.0004), height (p = 0.5342) and BMI (p = 0.4409) and ICCs between the informed and uninformed group (see Table 1).

When measured and self-reported BMI categories were examined the percentage agreement was 78% for the informed group and 81% for the uninformed group. The kappa values were 0.63 [95% CI 0.58, 0.78] for the informed and 0.72 [95% CI 0.61, 0.83] for the uninformed group and overlap between 95% CIs indicated no significant differences.

The Bland-Altman plots for weight, height and BMI for the informed and uninformed groups are shown in Figures 1, 2 and 3.

As there were no significant differences in accuracy of self-reported weight and height between the groups, the sample was pooled to assess overall agreement and reliability. Overall mean differences between self-reported and measured values were -1.2 kg (4.0) for weight [males -1.2 kg (4.4), females -1.2 kg (4.4)], 0.8 cm (5.4) for height [males 1.5 cm (3.7), females 0.3 cm (4.9)] and -0.6 kg/m² (2.0) for BMI [males -0.9 kg/m² (1.7), females -0.4 kg/m² (2.3)]. The overall ICCs for self-reported and measured values and their corresponding 95% CIs were 0.97 [0.97, 0.98] for weight, 0.91 [0.89, 0.93] for height and 0.94 [0.93, 0.95] for BMI. The Bland Altman plots and LOA provide an indication of the extent of underreporting and overreporting of weight, height and BMI when compared to measured values (see Figures 1, 2, 3).

The overall percentage agreement between self-reported and measured classification of BMI categories was 80% [95% CI 75, 84]. Twenty percent of those who were overweight were categorised as normal weight using self-reported weight and height (see Table 2). Of those who were obese, 22% were classified as overweight using self-reported weight and height. The prevalence of obesity was underestimated by 3% (35% using measured and 30% using self-report) and prevalence of normal weight was overestimated by 5% (27% using measured and 32% using self-report). The kappa for categorisation of BMI was 0.70 [95% CI 0.63, 0.77], representing substantial agreement [20] and that level of agreement was greater than expected by chance alone (p = 0.001).

There were no significant differences by age, when mean differences in measured and self-reported weight, height and BMI were compared (see Table 3).

| Table 1 Mean difference and intraclass correlation for weight, height and BMI for informed and uninformed group |
|---|---|---|
| Group | Informed | Uninformed |
| | (n = 172) | (n = 165) |
| **Sex n (%)** | | |
| Male | 78 (45) | 69 (43) |
| Female | 94 (55) | 91 (57) |
| **Age n (%)** | | |
| 18-39 | 60 (35) | 48 (30) |
| 40-64 | 67 (39) | 74 (46) |
| 65+ | 45 (26) | 38 (24) |
| **Number with concession health care (%)** | | |
| | | 71 (42) | 66 (42) |
| **Mean difference (sd) [95% CI]** | | |
| Weight | -1.2 (4.0) | -1.4 (1.2) |
| | [-2.3, 0] | [-2.4, 0] |
| Height | 0.7 (3.9) | 0.8 (3.8) | 0.7 (3.8) |
| | [0.8, 3] | [-0.7, 1.9] |
| BMI | -0.6 (2.2) | -0.7 (1.5) |
| | [-0.8, 3.5] | [-0.8, 3.0] |

ICC: intraclass correlation; CI: confidence interval; BMI: Body Mass Index; sd: standard deviation.
*mean difference calculated using self-reported weight minus measured weight.
**missing data for informed group: 3 missing for weight, 3 missing for height, subsequently 6 missing for BMI.
***missing data for uninformed group: 2 missing for weight, 6 missing for height, subsequently 5 missing for BMI.
Discussion

This study demonstrated that informing general practice patients that their height and weight would be measured did not improve accuracy of self-report. This contrasts with Black and colleagues' findings, where those who were informed that they would be measured reported their weight and height significantly more accurately than those who were not informed [16]. This difference in findings could have occurred due to several differences in study methodology, setting, participants and statistical analyses conducted. Black and colleagues recruited their sample for a health screen in a shopping mall whereas the current study recruited participants presenting for general practice care. General practice patients may be more willing to disclose their weight and height compared to volunteers in a shopping mall. Further, Black's study included only participants aged between 18 to 28 years whereas only a small proportion (18%) of our sample was aged between 18 and 29 years [16]. Those in the younger age bracket may be more likely to be affected by cultural ideals regarding weight and height [24], which might have led to attempts to misreport these measures. Inconsistent findings regarding the accuracy of self-reported weight and height in older patients have been identified, with one longitudinal study reporting that only small changes in reporting of weight and height occurred with increasing age [25] and others identifying substantial differences between measured and self-reported weight and height in those older [26,27].

Our study did not find any significant differences in mean reporting of self-reported and measured values with age category, and no pattern of increasing or decreasing difference with age was observed. Black and colleagues also asked participants in the informed group six additional 'body weighing questions' which may have helped with recall of weight [16]. The current study aimed to test solely if informing patients that their weight and height would be measured would improve accuracy of self-report and thus did not include these questions. Given that GPs see a larger proportion of older patients, reporting of weight and height in this group may be less affected by social desirability bias and suggests that misreporting may be attributed largely to recall bias or not having an accurate knowledge of one's
Table 2: Categorisation of body mass index (BMI) category based on self-reported and measured weight and height

<table>
<thead>
<tr>
<th>Self-report</th>
<th>Underweight</th>
<th>Normal weight</th>
<th>Overweight</th>
<th>Obese</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>4 (27)</td>
<td>2 (23)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>6 (19)</td>
</tr>
<tr>
<td>Normal weight</td>
<td>2 (13)</td>
<td>78 (91)</td>
<td>23 (26)</td>
<td>0 (0)</td>
<td>103 (23)</td>
</tr>
<tr>
<td>Overweight</td>
<td>0 (0)</td>
<td>6 (7)</td>
<td>85 (94)</td>
<td>25 (22)</td>
<td>116 (26)</td>
</tr>
<tr>
<td>Obese</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>7 (8)</td>
<td>88 (100)</td>
<td>95 (20)</td>
</tr>
<tr>
<td>Total</td>
<td>6 (19)</td>
<td>86 (100)</td>
<td>115 (100)</td>
<td>113 (100)</td>
<td>320</td>
</tr>
</tbody>
</table>

*Total less than overall included due to invalid values in self-reported weight and height.

*Percentage reported is proportion of measured for each BMI category.

Underweight defined as BMI <18.5 kg/m². Normal weight defined as BMI ≥18.5 kg/m² and <25 kg/m². Overweight defined as BMI ≥25 kg/m² and <30 kg/m². Obese defined as BMI ≥30 kg/m².

Consistent with findings in other populations [8], participants in the present study tended to underreport their weight and overreport their height. Mean differences between self-reported and measured weight (−1.2 kg in males; 1.2 kg in females) and height (1.5 cm in males; 0.3 cm in females) are within the range of that identified in a review examining accuracy of self-reported weight (−1.9 kg to 0.4 kg in males; −1.6 kg to −0.7 kg in females) and height (−1.3 cm to 2.3 cm in males; −1.7 cm to 2.2 cm in females) in the general population [8]. Only one Australian study was included in the review; however, this study did not report mean differences. When compared to other Australian studies, our study had lower mean differences in self-reported and measured values for reporting of height and weight, particularly for females. Taylor et al. identified mean differences of −1.5 kg in males; −1.8 kg in females for weight and 1.4 cm in males; 1.3 cm in females for height [12]. Another study identified mean differences of 2.0 cm in males; 0.8 cm in females for height and −1.4 kg for males and −3.9 kg for females [13]. There is some evidence to suggest that females who had recently consulted a doctor may be able to more accurately recall their weight and height [28]. Additionally, patients presenting for care to their GP may represent a more ‘health conscious’ sample and thus, may be more aware of their weight and height measurements. Differences could also be attributed to the fact that there was no time lag between self-report and measured assessments in our study, whereas an average of 23.5 days between self-reported and measured data was reported in the study conducted by Taylor [12].

Overall, 80% of participants were accurately classified as underweight, normal weight, overweight or obese using self-reported weight and height. The use of self-reported BMI resulted in no difference in prevalence of overweight and only a 5% lower prevalence of obesity when compared to estimates obtained using measured data. These findings are favourable when compared to other studies which indicate that self-reported data underestimated the proportion of participants classified as overweight by 2% to 12% and obese by approximately 7% [12, 13]. The present findings however, are comparable to the 2008 Australian National Health Survey, which identified a 6% rate of underestimation of prevalence of overweight or obese when self-reported data was compared to measured data [10].

While the current study identified high reliability between self-reported and measured weight and height, represented by high ICCs (>0.9) for weight, height and BMI, the estimated Bland Altman LOAs suggests that accuracy of individuals’ self-report may vary. When compared to measured weight, inaccuracies in self-reported weight ranged from overestimation of 6.7 kg to underestimation of 9.1 kg. Similarly, inaccuracies in self-reported height ranged from an overestimation of 8.6 cm to underestimation of 7.1 cm. This subsequently led to overreporting of BMI by 3.3 kg/m² and underreporting of up to 4.6 kg/m².

Table 3: Mean difference between measured and self-reported weight, height and BMI by age categories in Australian general practice patients

<table>
<thead>
<tr>
<th>Mean differencea (standard deviation)</th>
<th>ANOVA test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Weight</td>
<td>0.2</td>
</tr>
<tr>
<td>Height</td>
<td>0.2</td>
</tr>
<tr>
<td>BMI</td>
<td>0.2</td>
</tr>
</tbody>
</table>

aMean calculated using measured self-reported minus measured values.

Strengths and limitations
A high consent rate was achieved, with 93% agreeing to have their weight and height measured. This high consent rate may be due to the use of the touchscreen computer which could have provided participants with a more private way of reporting weight and height. There was no time lapse between provision of self-report and actual
measurement of weight and height, thus reducing potential error attributed to weight change during the time lapse. The use of ICCs and Bland Altman plots with LOAs provides a more robust examination of agreement compared to the more traditionally used Pearson correlation coefficients as it provides an indication of variability and agreement rather than association. The ICC, however, treats self-reported and measured values as exchangeable (i.e., method of measurement is assumed to be a random effect). When systematic differences between methods of measurement occur, high ICCs may not necessarily imply high agreement.

Some of the variation between self-reported values and measured values may be accounted for by the way in which participants report their weight and height (e.g., end-digit preferences [12] and reporting in imperial units rather than metric). A large proportion of participants included in this study were aged 65 years and above. However, when mean differences in self-reported and measured values were compared, no differences were identified between older and younger participants. This study was conducted in only three practices, potentially limiting the generalisability of findings. No significant differences in participants’ sex was observed when compared to a larger Australian general practice dataset (BREACH), which included 95,839 patient encounters recruited by 958 GPs [7]. However, a difference in distribution of age was observed between our sample and the BREACH dataset [7].

Conclusion

Informing general practice patients that their weight and height would be measured did not significantly improve accuracy of self-report. Testing this strategy in subgroups likely to be affected by cultural ideals regarding weight (i.e., younger, female) may be beneficial in helping identify ways to improve accuracy of self-report for these groups. Self-reported weight and height provides relatively accurate estimates of BMI in Australian general practice patients. Thus, in circumstances where population trends are of interest such as in large surveillance studies, self-report is likely to be an accurate alternative. While the average bias of self-reported weight and height as estimates of the measured quantities is small, the LOAs indicate that there is a need for these values to be interpreted with caution in individuals.

Competing interest

The authors declare no competing interest.

Authors’ contributions

SN, MC, CD and PSF participated in conception of the study and survey design. SN conducted all data collection and PSF data analysis. SN, MC and CD had input into the statistical analysis. All authors offered critical comments on the draft of the manuscript and approved the final submitted version.

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References


APPENDIX 1.2: STATEMENTS OF CONTRIBUTION FROM CO-AUTHORS

Statement of contribution

I, Dr Mariko Carey, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript:


Date
14/04/2013

Dr Mariko Carey (Co-author) Date

14/04/2013

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06/05/2013

Professor John Rostas (Assistant Dean, Research Training) Date
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APPENDIX 2: PAPER 2
APPENDIX 2.1: STATEMENTS OF CONTRIBUTION FROM CO-AUTHORS

Statement of contribution

I, Dr Mariko Carey, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript:

Yoong SL, Carey M, Sanson-Fisher R, D’Este C, Mackenzie L, Boyes A. A cross-sectional study examining Australian general practitioners’ identification of overweight and obese patients

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I, Professor Catherine D’Este, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript:


14/04/2013

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Professor Catherine D’Este (Co-author)       Date

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Yoong SL, Carey M, Sanson-Fisher R, D’Este C, Mackenzie L, Boyes A. A cross-sectional study examining Australian general practitioners’ identification of overweight and obese patients

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Yoong SL, Carey M, Sanson-Fisher R, D’Este C, Mackenzie L, Boyes A. A cross-sectional study examining Australian general practitioners’ identification of overweight and obese patients

14/04/2013

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Professor John Rostas (Assistant Dean, Research Training)       Date
APPENDIX 2.2: SAMPLE SIZE CALCULATION FOR PAPER TWO

This study aimed to obtain 1,200 surveys from participating general practitioners (GPs). Assuming a design effect of approximately 1.2, this would provide an effective sample size of approximately 1,000. Assuming that the estimated prevalence of overweight/obesity is approximately 60% based on the Bettering the Evaluation and Care of Health (BEACH) study dataset,¹ and expected sensitivity is 60% and specificity is 90%,² this would enable the calculation of sensitivity and specificity for GP identification of overweight/obesity with approximately 4% precision. Based on an estimated prevalence of 60% of obesity and overweight and calculated from patient self-reported weight and height, this sample size would provide an effective subsample of 600 patients self-classified as overweight or obese. This subsample would also allow detection of differences in characteristics between overweight and obese patients who were and were not detected by their GPs, of approximately 11% for binary explanatory variables, with 5% significance level and 80% power.³

References


APPENDIX 3: PAPER 3
APPENDIX 3.1: STATEMENTS OF CONTRIBUTION FROM CO-AUTHORS

Statement of contribution

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35
APPENDIX 4: PAPER 4
APPENDIX 4.1: PUBLISHED MANUSCRIPT

Citation

A cross-sectional study assessing the self-reported weight loss strategies used by adult Australian general practice patients

Sze Lin Yoong\textsuperscript{1,2}, Mariko Leanne Carey\textsuperscript{1,3}, Robert William Sanson-Fisher\textsuperscript{1,3} and Catherine D'Este\textsuperscript{2,3}

Abstract

**Background:** Obesity is a significant public health concern. General practitioners (GPs) see a large percentage of the population and are well placed to provide weight management advice. There has been little examination of the types of weight loss strategies used in Australian general practice patients. This cross-sectional study aimed to describe the proportion of normal weight, overweight and obese general practice patients who report trying to lose weight in the past 12 months, the types of weight loss strategies and diets used as well as the proportion consulting their GP prior to trying to lose weight.

**Methods:** Adult patients completed a touchscreen computer survey while waiting for their appointment. Responses from 1335 patients in twelve Australian practices are reported.

**Results:** A larger proportion of obese patients had tried to lose weight in the past 12 months (73%) compared to those who were overweight (55%) and normal weight (33%). The most commonly used strategy used was changing diet and increasing exercise in all BMI categories. Less than 10% used strategies such as prescription medication, over the counter supplements and consulted a weight loss specialist. Low calorie and low fat diets were the most frequently reported diets used to lose weight in those who were normal weight, overweight and obese. Overall, the proportion seeking GP advice was low, with 12% of normal weight, 15% of overweight and 43% of obese patients consulting their GP prior to trying to lose weight.

**Conclusions:** A large proportion of overweight or obese patients have tried to lose weight and utilized strategies such as changing diet and increasing exercise. Most attempts however were unassisted, with low rates of consultation with GPs and weight loss specialists. Ways to assist overweight and obese general practice patients with their weight loss attempts need to be identified.

**Keywords:** Primary health care, Obesity, Weight loss, General practice, Australia

Background

Obesity is a significant public health concern, affecting a large proportion of people worldwide. Recent studies have reported that approximately 62% of Australians\textsuperscript{[1]} and 68% of Americans\textsuperscript{[2]} have a body mass index (BMI) of ≥ 25 kg/m\textsuperscript{2}. This condition imposes significant burden on both the individual and society and is estimated to cost 21 billion dollars in Australia\textsuperscript{[3]} and up to 147 billion in the United States annually\textsuperscript{[4]}. It is well known that weight reductions of five to 10% of baseline body weight in those who are obese can reduce the risk of diabetes and improve clustering of cardiovascular disease related risk factors\textsuperscript{[5]}. Previous population studies in the United States have reported that a substantial proportion of the population have attempted to lose weight by restricting energy and fat intake\textsuperscript{[6,7]}. In Australia, watching the type of food eaten, reducing dietary fat intake and increasing exercise were the most common weight loss strategies reported in population studies\textsuperscript{[8]}. General practitioners (GPs) see more than 60% of the population at least once a year\textsuperscript{[9]} and are well placed to provide weight management advice. Overweight and
obesity are also common among general practice patients, with prevalence rates of as high as 70% being reported in this setting [10]. Given that a large proportion of the population see their GP at least once a year, and that many of these will be overweight or obese, this suggests that there may be potential for GPs to opportunistically provide weight management advice and assistance.

A previous study documented that up to 36% of general practice patients have attempted to lose weight at any time in the past 12 months, with a substantial proportion of normal weight patients attempting weight loss [11,12]. Charles et al reported that diet and/or exercise were the most common strategies used by general practice patients [13]. However, previous studies have provided little detail regarding the specific types of weight loss diets used by patients, and whether or not patients consult their GP prior to commencing a new diet or weight loss strategy. This information is likely to be important to informing the development of interventions and tailoring of weight loss discussions in the primary care setting.

The study conducted by Charles et al relied on practitioners to ask patients regarding previous weight loss attempts and methods used [13]. In contrast, the touchscreen computer health questionnaire used in this study is a novel method of data collection and may provide participants with more privacy when reporting sensitive information. The use of electronic data collection methods has previously been shown to be acceptable in a variety of settings such as oncology wards [14] and primary care [15]. It has been used to collect a range of patient-reported information including quality of life [16], psychosocial distress [14], receipt of preventive care [15] and level of pain [17].

Findings from this study will provide insight into the weight management strategies of general practice patients and may help better inform weight loss discussions that occur in this setting.

This study aimed to describe within the normal weight, overweight and obese category; the proportion attempting to lose weight in the previous 12 months, the types of strategies and diets used as well as the proportion that seeks GP advice prior to trying to lose weight.

Methods

Setting

This cross-sectional study was conducted in twelve general practices in Australia between 1st November 2010 and 11th November 2011.

Participants

Eligible participants were aged 18 years and above, able to read and understand English sufficiently to complete the survey; and physically and mentally able to provide consent.

Study procedures

A research assistant was present in the surgery and approached consecutive adult patients presenting for care. The research assistant administered one of three surveys on a touchscreen computer to consenting patients. Every third patient received the same survey. Results from the weight loss survey are presented in this paper. If a patient presented for care while the touchscreen computers were in use, the research assistant did not approach that patient. Participants were afraid to exit the survey if they were called in for their appointment. The research assistant recorded the gender of all invited patients. Equipment: A commercial program, Digivox survey suite software (CREOSO - Digivox Survey Center, Phoenix, Arizona) was used to program the survey. The survey was administered using DELL Latitude XT2 line open laptops.

The survey was designed to have a Fleiss-Kennard score of 8 in order to minimize the number of patients excluded due to having insufficient English to understand the survey. The survey assessed the following:

Weight and height

Participants were asked to provide their self-reported weight in kilograms (kg) or stones and height in feet/inches or centimetres (cm). Participants were categorized as underweight (BMI <18.5 kg/m²), normal weight (BMI ≥18.5 kg/m² and <25 kg/m²), overweight (BMI ≥25 kg/m² to BMI <30 kg/m²) or obese (BMI ≥30 kg/m²) [18].

Demographics

Participants provided information on their age, gender, ethnicity and highest level of education completed.

Weight change attempts

Participants were asked whether they had tried to change their weight in the last 12 months.

Types of strategies used

Those who had tried to lose weight in the past 12 months were asked about the specific types of strategies utilized. Participants were asked to select all strategies that applied to them from the following options: (Professional weight loss center programs, Prescription medications, Over-the-counter supplements, Increased exercise, Changed diet, Consulted a weight loss specialist, and Other). Professional weight loss center programs refer to commercial weight loss programs where lifestyle change is often supervised by weight loss consultants. Prescription medication refers to all medication prescribed by a medical doctor including, Dietethylpropion, Pentermine, Sulpiride, and Orlistat. Over-the-counter supplements include all non-prescribed herbal/non-herbal weight loss supplements (e.g. guarana and weight loss pills). Increased exercise refers to any intentional attempts to increase levels of
activity to change weight and changing diet refers to intentional dietary changes to produce weight loss. Consulting a weight loss specialist refers to consulting dietary or physical activity specialists including dieticians or exercise physiologists.

If patients indicated that they had tried to change their diet, information about type of diets tried in the past 12 months was elicited. Response options included specialized meal replacements (including milkshakes, power bars), low calorie diet (reduced overall food intake), Atkins diet (low carbohydrate/high protein diet), low fat diet (reduced fat), detox diet, high fibre diet, celebrity/fad diets or other diets.

Consultation with GP
Participants who indicated trying to change their weight in the last 12 months were asked if they had consulted their GP prior to attempting to lose weight.

Ethical approval
This study was approved by the University of Newcastle Human Research Ethics Committee (HREC) (H-2009-0341) and ratified by The University of New South Wales HREC (HREC2009/93/UN H-2009-0341) and Monash University HREC (CI09/3630 – 2009/0186).

Statistical analyses
The proportion of males consenting were compared with non-consenters using Pearson’s Chi squared test. Those in the underweight group were excluded due to the small proportion in this group. Descriptive statistics including frequencies, proportions and 95% confidence intervals (CI) were calculated for previous attempts to change weight, types of strategies and diet used and those consulting their GP prior to trying to lose weight within the normal weight, overweight and obese categories. All analyses was adjusted for clustering of individuals within practices using svy commands. All analyses were performed using STATA 11.0.

Results
Overall, 3900 participants were approached to complete the weight loss module and 1620 consented to participate a consent rate of 85%. 1547 (85%) participants provided data regarding weight and height. Of those who were excluded, 11% (n = 27) did not provide valid weight and height information and 89% (n = 221) were called in for their general practice appointment prior to completion of the weight loss module. An additional 37 participants were excluded as they were in the underweight category. A total of 1335 participants were included in the final analyses.

The demographic characteristics of included patients are shown in Table 1. There were differences in the proportion of females (F1,57; 17.26) = 12.6380, p < 0.001 and age (F4,35; 46.76) = 5.0127; p = 0.0016 between the normal weight, overweight and obese group.

More than half the participants (58%) [95% CI 49–66] were overweight or obese. Overall, 50% [95% CI 45–55] indicated that they had tried to lose weight, 31% [95% CI 22–44] had tried to put on weight and 47% [95% CI 41–53] had not tried to change their weight in the past 12 months. The proportion of patients who had attempted to lose weight increased between normal, overweight and obese groups (see Table 2).

Of the 1676 people who had tried to lose weight, 50 (7.9%) [95% CI 5.3 – 11] reported using professional weight loss center programs, 11 (1.7%) [95% CI 0.5 – 4.3] used prescription medication, 41 (6.5%) [95% CI 4.3 – 8.8] used over the counter supplements, 47 (72.3%) [95% CI 67–76] changed their diet, 859 (52%) [95% CI 47–59] increased exercise and 43 (6.5%) [95% CI 4.2–9.8] consulted a specialist. A small proportion (n = 25 (3.9%) [95% CI 2.6–5.5]) indicated using ‘other’ strategies to lose weight.

The most commonly used strategy in all BMI categories were changing diet and increasing exercise (see Table 3). Less than 10% of participants used prescription medication, over the counter medicine and consulted a specialist.

The most commonly used diets were low calorie diet and low fat diets (see Table 4). The proportion using specialized meal replacements in the obese group was

| Table 1 Demographic characteristic of study participants by BMI category |
|-----------------|-----|-----|-----|
| Characteristic  | Normal weight (n = 258) | Over weight (n = 173) | Obese (n = 304) |
| Age (yrs)*      |     |     |     |
| 18–24           | 47  (4.4) | 19  (4.0) | 11  (3.6) |
| 25–44           | 166 (20) | 11  (23) | 72  (24) |
| 45–64           | 173 (31) | 176 (37) | 126 (41) |
| 65+             | 173 (31) | 159 (34) | 95  (31) |
| Gender (% female) |   |     |     |
| 387 (78)        | 237 (50) | 189 (62) |
| Ethnicity       |     |     |     |
| Caucasian       | 532 (99) | 472 (100) | 301 (99) |
| Has private health insurance | |     |     |
| 312 (61)        | 262 (61) | 155 (51) |
| Level of Education (n = 1231)* | |     |     |
| Completed HSC and below | 213 (41) | 196 (43) | 135 (40) |
| TAFE or Diploma/University | 253 (48) | 200 (48) | 119 (43) |
| Postgraduate    | 42 (8.1) | 27 (6.2) | 12 (4.3) |
| Other            | 11 (2.1) | 11 (2.5) | 14 (4.8) |
|                  |     |     |     |

* p < 0.05; † Number less than total due to incomplete surveys. HSC = High School Certificate; TAFE = Technical And Further Education.
almost double those in the overweight and normal weight group.

Of those who had tried to lose weight in the past 12 months, 156 (21%) [95% CI 17–26] consulted their GP prior to trying any strategies to change their weight. Of those who were obese and had tried to lose weight, 85 (62% [95% CI 36–48]) had consulted their GP prior to trying to change their weight. A smaller percentage of those overweight (n = 37 [15%] [95% CI 10.4–21.2]) and normal weight (n = 16 [7.8%] [95% CI 3.8–16]) had consulted their GP.

Discussion

Overall, 50% of patients indicated trying to lose weight in the past 12 months. This figure is higher than that identified in previous studies arising from the Bettering the Evaluation and Care of Health (BEACH) dataset, which reported that 35% to 37% [E1,E2,E3] of patients have attempted to lose weight in the previous 12 months. As part of data collection in the BEACH program, GPs ask their patients about weight loss attempts and types of strategies used. It is possible that patients may have been reluctant to discuss weight loss attempts with their GPs, thus resulting in a lower proportion reporting trying to lose weight. In contrast, the use of a touchscreen computer survey may be a less confronting method of collecting information. The large proportion attempting to lose weight in the present study may also be a result of the increasing prevalence of overweight and obesity in the population [1], although other studies have not noted increases in weight loss attempts despite escalating rates of obesity [6].

Alternatively, social media campaigns promoting healthy weight including “Measure Up” and “Swap It Don’t Stop it” launched in Australia at the time of data collection may have increased patient awareness regarding healthy weight. With the increased focus on weight reduction, media messages (including entertainment and advertising) may have also affected patients’ attitudes towards weight loss. Additionally, the stigma faced by those who are obese has been well documented and may be a strong motivator for attempting to lose weight in this group [19].

Also worth noting is that one third (33%) of healthy weight patients indicated trying to lose weight in the last 12 months. Attempts to lose weight in this group could be due to dissatisfaction with current weight or having an unrealistic expectation of ideal body weight [20]. There needs to be attempts to promote the maintenance of healthy weight among those not overweight.

Similar to previous studies [E4,E5], the most common strategies used by participants were changing diet and increasing exercise. Despite being key components to weight loss, almost half of those who were in the overweight or obese group and had attempted to lose weight did not increase their exercise and approximately 30% did not change their diet. This could be attributed to discouragement from previous failed attempts to change lifestyle habits or difficulty in engaging in exercise due to physical conditions such as osteoarthritis and chronic pain which are more prevalent among those with excess weight [20].

Only a small percentage of general practice patients had previously used prescription medicine. While the use of

### Table 2 Proportion trying to change their weight in last 12 months by BMI category

<table>
<thead>
<tr>
<th>BMI Category</th>
<th>Normal (n = 559)</th>
<th>Overweight (n = 471)</th>
<th>Obese(n = 303)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/% (95% CI)</td>
<td>n/% (95% CI)</td>
<td>n/% (95% CI)</td>
<td></td>
</tr>
<tr>
<td>Tried to lose weight</td>
<td>187 (33) [27–41]</td>
<td>250 (53) [46.4–60.9]</td>
<td>220 (73) [65.0–79.0]</td>
<td>557</td>
</tr>
<tr>
<td>Tried to gain weight</td>
<td>33 (6.0) [3.7–9.4]</td>
<td>6 (1.3) [0.4–3.9]</td>
<td>2 (0.7) [0.4–3.3]</td>
<td>41</td>
</tr>
<tr>
<td>Have not tried to change weight</td>
<td>155 (26) [19–34]</td>
<td>205 (44) [36–49]</td>
<td>61 (20) [12–31]</td>
<td>421</td>
</tr>
</tbody>
</table>

* Number less than total due to incomplete surveys.

#### Table 3 Proportion of participants in each BMI category who utilized each type of weight loss strategy

<table>
<thead>
<tr>
<th>Strategies used</th>
<th>Normal weight (n = 559)</th>
<th>BMI (n=471)</th>
<th>Obese (n=303)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/% (95% CI)</td>
<td>n/% (95% CI)</td>
<td>n/% (95% CI)</td>
</tr>
<tr>
<td>Professional weight loss centre programs</td>
<td>6 (3.2) [1.3–7.5]</td>
<td>22 (8.5) [5.1–14.4]</td>
<td>22 (10.0) [5.5–18.0]</td>
</tr>
<tr>
<td>Prescription medication</td>
<td>2 (1.1) [0.4–2.8]</td>
<td>1 (0.4) [0.0–3.6]</td>
<td>8 (3.0) [1.5–8.5]</td>
</tr>
<tr>
<td>Over the counter supplements</td>
<td>8 (4.3) [2.4–6.5]</td>
<td>16 (6.5) [4.9–14.4]</td>
<td>16 (7.3) [4.4–12.7]</td>
</tr>
<tr>
<td>Changed diet</td>
<td>100 (70) [66–83]</td>
<td>181 (70) [63–79]</td>
<td>156 (71) [68–77]</td>
</tr>
<tr>
<td>Increased exercise</td>
<td>114 (63) [59–72]</td>
<td>117 (60) [54–62]</td>
<td>108 (45) [41–57]</td>
</tr>
<tr>
<td>Consulted a specialist</td>
<td>2 (1.1) [0.3–4.2]</td>
<td>15 (5.8) [3.3–9.3]</td>
<td>26 (8.5) [4.2–15.8]</td>
</tr>
</tbody>
</table>

* Number less than total due to incomplete surveys.

Total of column is larger than the number of participants in each group as participants were able to select more than one response.
prescription medicine has been shown to be effective in producing moderate weight loss [21], this strategy may be less acceptable to patients and is associated with side effects such as palpitations, tremors and excess sweating [22]. Additionally, the removal of sibutramine from the Australian market in late 2010 may have affected the proportion being prescribed medication for weight loss.

Few participants in the overweight and obese group used structured programs where weight loss attempts were assisted by either health care providers (including weight loss specialists) or non-health care providers (including weight loss centres). Previous studies have shown that weight loss counselling delivered by dietitians is effective in producing clinically significant weight loss in general practice patients [23]. Those who consult a specialist might be more likely to receive recommendations in line with best evidence guidelines. There is also some evidence to suggest that the use of structured commercial programs is effective in producing weight loss, with a study reporting that referral by primary care provider to Weight Watchers produced significantly more weight loss compared to usual care [24]. A recent randomized controlled trial (RCT) reported that referrals to commercial-based programs produced significantly more weight loss when compared to primary care-based specialist delivered program [25]. It appears that a large proportion of those in the overweight and obese group have attempted to lose weight without seeking help from weight loss providers that may have been able to assist them with achieving weight loss.

The most commonly used diets were low calorie and low fat diets as well as meal replacements. As overall energy reduction is needed for weight loss, it is reassuring to note that a large proportion of overweight and obese patients in this study reported reducing their overall calorie intake using a low calorie diet. More than 30% of patients used a low fat diet. While limiting dietary fat may result in some weight loss, guidelines recommend overall calorie reduction rather than restriction of individual macronutrients [26]. An overconsumption of low fat products may also lead to increased energy intake as consumers perceive these products to be healthier [27]. Meal replacements were used by 13% of obese participants. Meal replacements are a promising strategy for weight loss as it provides a structured way of reducing overall calories consumed. A study in general practice patients reported that use of meal replacements with dietitian counselling resulted in almost 10 kg weight loss [28]. Only a small proportion of general practice patients (≤5%) reported using diets that could be potentially be harmful to their health (i.e., detox and celebrity diets).

Only 21% of patients consulted their GP prior to trying any strategies to change their weight. This low proportion seeking GP advice reflects previous findings that only 15% of overweight or obese general practice patients sought GP advice to lose weight [13]. Despite findings indicating that more than 50% of patients would consult their GP for weight management advice [11], the proportion seeking GP advice is low. This discrepancy between those wanting advice and those seeking care may be due to patient ambivalence about how prevention fits into a typical consult as well as perceptions that the GP’s role is more focused on dealing with the presenting issue [29]. The role of the GP in weight management has yet to be defined with some arguing that over presentation to health care professionals can result in the medicalization of obesity, leading to the use of more clinical methods of management (including pharmacology and surgery) [30]. GPs are however, a valuable and accessible source of information regarding evidence-based weight management strategies and the involvement of GPs in intervention studies have been shown to increase retention and adherence to weight loss strategies [23].
Strengths and limitations
This study relied on patient self-report to obtain information regarding BMI (weight and height), weight loss attempts and strategies. As self-reported is associated with social desirability bias, this may have resulted in an over-estimation in proportion trying to lose weight and under-estimation of using popular diets known to be hazardous to health (e.g.fad/celebrity diets). However, the use of the touchscreen computer to collect information may have provided patients with more privacy, thus reducing misreporting attributed to social desirability bias. Additionally, studies have also shown that patients tend to underreport weight and overreport height, leading to an underestimation of BMI [31]. Measurements conducted in a subsample of participants (unpublished data) identified a low mean error between self-reported and measured weight and height. This study had a large sample size and high patient consent rate (85%), suggesting that it is likely to be representative of adult patients presenting for care in the participating practices. Findings from this study are not generalizable to non-English speaking patients as this group was specifically excluded from the study. However, given that less than 10% of those presenting for care are from non-English speaking backgrounds [9], it is likely that findings reported here are representative of those typically presenting for care to these practices.

Practice implications
Patients who have received advice from a health care professional to lose weight are more likely to attempt to lose weight [32]. This suggests that with a large proportion of overweight and obese patients attempting to lose weight in the past 12 months, there is an opportunity for GPs to play a greater role in assisting patients with weight loss attempts. To ensure feasibility in the time-pressed general practice setting, it is necessary to establish systems to support GPs in this role. Practice nurses may play an important role in assisting with identification of overweight or obesity as well as scheduling follow up reviews where appropriate [33-34]. Future studies are needed to examine the way in which primary care providers can assist overweight and obese patients with their weight loss attempts in order to produce weight loss.

Conclusion
A large proportion of overweight and obese patients report having tried to lose weight in the past 12 months. Strategies such as changing diet and increasing exercise were commonly reported. Most attempts however were unsustained, with low rates of consultation with GPs and weight loss providers. Ways to assist overweight and obese patients with their weight loss attempts need to be identified.
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APPENDIX 4.2: STATEMENTS OF CONTRIBUTION FROM CO-AUTHORS

Statement of contribution

I, Dr Mariko Carey, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript:


14/04/2013

Dr Mariko Carey (Co-author)

14/04/2013

Sze Lin Yoong (Candidate)        Date

06/05/2013

Professor John Rostas (Assistant Dean, Research Training)        Date
Statement of contribution

I, Laureate Professor Robert Sanson-Fisher, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript:


14/04/2013

__________________________________________________________
Laureate Professor Rob Sanson-Fisher (Co-author) Date

14/04/2013

__________________________________________________________
Sze Lin Yoong (Candidate) Date

06/05/2013

__________________________________________________________
Professor John Rostas (Assistant Dean, Research Training) Date
Statement of contribution

I, Professor Catherine D’Este, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript:


14/04/2013

Professor Catherine D’Este (Co-author)       Date

14/04/2013

Sze Lin Yoong (Candidate)       Date

06/05/2013

Professor John Rostas (Assistant Dean, Research Training)       Date
APPENDIX 4.3: SAMPLE SIZE CALCULATION FOR PAPER FOUR

This study aimed to invite 1,500 patients to participate. Based on a survey consent and completion rate of 85%, this would provide 1,275 respondents. Assuming a design effect due to clustering of patients within general practice of 1.2, this would provide an effective sample size of approximately 1,000. Based on data from previous research,¹ this would allow prevalence estimations, with 95% CI within ±7%, of the point estimate for the proportion of normal weight, overweight and obese patients attempting to lose weight in the previous 12 months. Assuming that approximately 40% of the overall sample had previously tried to lose weight, this would allow prevalence estimations, with 95% CI, within ±11%, of the point estimate for the proportion of normal weight, overweight and obese patients who had utilised each weight loss strategy in the previous 12 months.

References

APPENDIX 5: PAPER 5
APPENDIX 5.1: PUBLISHED MANUSCRIPT

Citation


Available online from:

http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=9036182
A systematic review of behavioural weight-loss interventions involving primary-care physicians in overweight and obese primary-care patients (1999–2011)

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Link to this article: http://journals.cambridge.org/abstract_S1368980011004375

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A systematic review of behavioural weight-loss interventions involving primary-care physicians in overweight and obese primary-care patients (1999–2011)

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Priority Research Centre for Health Behaviour, School of Medicine and Public Health, University of Newcastle, Callaghan, NSW 2308, Australia and Hunter Medical Research Institute, Newcastle, NSW, Australia

Submitted 13 June 2012; Final revision received 21 August 2012; Accepted 24 August 2012

Abstract
Objective: The present review aimed to examine the effectiveness of behavioural weight-loss interventions involving primary-care physicians in producing weight loss in overweight and obese primary-care patients.
Design: A systematic review was conducted by searching online databases (MEDLINE, EMBASE, Cochrane, PsycINFO and SCOPUS) from January 1999 to December 2011. All abstracts were screened and coded for eligibility. The Cochrane Effective Practice and Organisation of Care Group quality criteria were used to assess the methodological adequacy of included studies. Information related to study design, population characteristics and intervention details was extracted.
Setting: Primary care.
Subjects: Overweight or obese (defined as having a BMI ≥ 25.0 kg/m²) primary-care patients.
Results: Sixteen different studies were included. Of these, six assessed primary-care physicians’ delivery of weight-loss counselling, nine assessed weight-loss counselling delivered by non-physician personnel with monitoring by primary-care physicians, and one assessed a multi-component intervention. Overall, high-intensity weight-loss counselling by primary-care physicians resulted in moderate but not clinically significant weight loss. High-intensity weight-loss counselling delivered by non-physicians, meal replacements delivered in conjunction with dietitian counselling and referral to commercial weight-loss centre programmes accompanied by regular monitoring by a primary-care physician were effective in producing clinically significant weight loss. Dietitian-delivered care appeared effective in producing weight loss regardless of level of intervention intensity.
Conclusions: Overall, there were few studies on this topic and the methodological rigour of some included studies was poor. Additional studies assessing the effectiveness and acceptability of potential interventions are needed to confirm these findings.

Obesity is one of the largest modifiable threats to public health in developed countries. It affects a large proportion of the population in developed countries and is associated with chronic diseases such as CVD, type 2 diabetes and some cancer. The rates of overweight and obesity have been steadily increasing in countries such as the USA, Australia and the UK. A modest weight loss of 5% in those obese has been shown to be beneficial in improving blood sugar control, CVD-related biomarkers and overall quality of life.

Primary-care physicians provide first-line health care in many countries. Australia, more than 80% of the population consult their primary-care physician at least once per annum. The average primary-care physician consultation rate in the UK rose from 4.9 consultations per person in 1995 to 5.5 in 2006. While more women and older people present for care, primary-care physicians still have access to a large proportion of the general population. Both patients and physicians perceive weight management to be part of a primary-care physician’s role. Primary-care physicians...
physicians have reported being interested in helping patients manage their weight, but face practical constraints in doing so\(^5\). Those who have been advised by their primary-care physician to lose weight are more likely to try to do so\(^1\). Primary-care physicians are also likely to have multiple opportunities to identify excess weight and deliver ongoing weight-management care required for sustained weight loss.

Despite the advantages of using primary care for interventions targeting obesity, the effectiveness of interventions in this setting has not been widely evaluated. Previous systematic reviews have identified bariatric surgery\(^2\) and pharmacological treatments\(^3\) as potentially effective methods for weight reduction; however, these interventions are costly and are usually indicated for the morbidly obese or those obese with existing conditions\(^4\). Behavioural, non-pharmacological interventions promoting dietary restrictions show some promise in producing moderate, short-term weight loss and are associated with fewer adverse events than pharmacological or surgical interventions\(^5\). However, most studies have evaluated behavioural interventions in selected patient groups or in community groups, with few specifically targeting primary-care patients.

UK\(^6\) and Australian\(^7\) preventive guidelines recommend that primary-care physicians assess patients for overweight and obesity and develop appropriate weight-management plans. The US Preventive Services Task Force recommends that intensive counselling and behavioural interventions be offered to all obese primary-care patients with high intensity being defined as more frequent than monthly contact offered in the first 3 months of treatment\(^8\). A review by Tsai et al., which included studies conducted only in the USA, reported that the use of pharmacological treatment (i.e., sibutramine and orlistat) accompanied by brief physician counselling or the use of meal replacements with dietitian-delivered counselling were potentially effective strategies for weight reduction in primary-care patients\(^9\). As their review was limited to studies conducted in the USA, there is a need to examine weight-loss interventions in other countries so that findings are relevant to practitioners located outside the US health-care system. With the recent removal of sibutramine from the European, US and Australian markets, findings regarding the effectiveness of this drug may no longer be relevant to practitioners. Further, consideration of the methodological rigor of studies is important to ensure that valid conclusions are drawn. The present review aims to describe the number, methodological rigor and effectiveness of behavioural intervention studies involving primary-care physicians that targeted weight loss in overweight or obese adult primary-care patients, met the Cochrane Effective Practice and Organisation of Care Group (EPOC) study design criteria\(^10\) and were published between 1999 and 2011.

Methods

The MEDLINE, EMBASE, Cochrane, PsycINFO and SCOPUS databases were searched using the following search terms: 'obesity OR overweight OR weight loss' AND 'primary health care OR family practice OR general practice OR general practitioner OR physician patient relations OR guideline adherence'. The search was limited to completed studies, published in English from 1999 until December 2011. This time frame was selected because Tsai et al.'s review examining interventions in primary-care patients identified few studies published before 1999. The reference lists of relevant systematic reviews and studies were manually searched to identify additional studies. No additional studies were identified.

Inclusion criteria

Participants

Adult primary-care patients (aged ≥18 years) who were overweight or obese (defined as BMI ≥25.0 kg/m\(^2\)) were included. Studies of interventions targeting specific patient groups (e.g., diabetes, hypertension) were included if the study specified overweight or obesity as an inclusion criteria.

Interventions

Studies aimed at reducing weight in overweight and obese primary-care patients were included. This encompassed behavioural interventions delivered by primary-care physicians alone or in conjunction with other personnel. Comparative trials where another intervention was compared with intervention(s) delivered by primary-care physicians were also included. Surgical and pharmacological interventions as well as studies where primary-care physicians were not involved in any component of the intervention were excluded.

Outcomes

Eligible studies included weight loss or weight reduction in BMI as an outcome. Weight/BMI change were chosen as the main outcomes as studies focused on other outcomes (such as physical activity levels, nutrition changes, biochemistry data) may not provide an adequate basis for identifying effective approaches for directly addressing overweight and obesity.

Study design

The following study designs that met the EPOC research criteria were included: randomised controlled trial (RCT), controlled clinical trial (CCT), controlled before-and-after study (CBA) and interrupted time series (ITS)\(^11\).

Quality assessment

The EPOC quality criteria for RCT, CCT and CBA were used to assess the methodological adequacy of
Weight-loss interventions involving primary-care physicians included studies. For each criterion, a score of 'yes' was assigned if the study met the criterion, 'no' if it did not, and 'unsure' if there was insufficient information to adequately decide if the criterion was met. A score out of nine for each study was reported.

Data extraction
The following were extracted by two authors independently.

Participants and intervention
Participant characteristics (including percentage of females, age, ethnicity and mean BMI) were extracted. Information related to the intervention, number of participants in each group, retention rate, mean weight change and whether statistically significant weight loss was achieved was also extracted. Whether a larger percentage of participants in the intervention group achieved clinically significant weight loss (for the purpose of the present review, this was defined as having a weight loss of more than 5% of initial body weight) compared with the control group was recorded. A weight loss of 5% or more of initial body weight has been shown to result in improvements in weight-related comorbidities. Where two intervention arms existed, comparisons between intervention and control groups were reported.

Intensity
Intensity of interventions were coded as 'low', 'moderate' or 'high' based on frequency of contact in the first 3 months. An intervention was defined as high intensity if there was more than monthly contact, moderate if monthly contact and low if less than monthly contact occurred in the first 3 months of the intervention. Where there was insufficient information, intensity was coded as 'unsure'.

Quality assurance
All abstracts were reviewed by one researcher (S.L.Y.) and full-text articles of potentially relevant articles were retrieved. As a quality assurance measure, 10% of the abstracts were reviewed and coded independently by a second reviewer (M.C., A.G.). All coding for quality criteria and data extraction were carried out by two authors (S.L.Y., A.G.) and differences resolved by mutual discussion.

Results
A total of 1,566 articles were obtained from the electronic search: Medline (n = 933), Cochrane (n = 103), SCOPUS (n = 281) and PsyCINFO (n = 268). Seventeen articles describing sixteen studies met the inclusion criteria (see Fig. 1). Martin et al. published findings from the same study at the end of the intervention and 2 years follow-up. All included studies were RCT except for one, which was a CBCT. One study was included as an RCT, although only two out of the three main arms were randomised. Only findings from the randomised groups were reported. Two studies did not have a control group but compared different interventions. A study by Wadden et al. was included although it had an intervention arm that included the use of pharmacological (subcutaneous). Only results from the brief intervention group, which did not involve medication, are reported here.

![Fig. 1 Selection of articles for inclusion in the present systematic review (EPOC, Effective Practice and Organisation of Care Group)](image-url)
Table 1: Methodological assessment of included intervention studies based on the EPOC risk of bias criteria

<table>
<thead>
<tr>
<th>Study</th>
<th>Study design</th>
<th>Allocation sequence</th>
<th>Concealment of allocation</th>
<th>Baseline measurements</th>
<th>Baseline characteristics</th>
<th>Incomplete data addressed</th>
<th>Knowledge of intervention prevented</th>
<th>Protection against contamination</th>
<th>Selective outcome reporting</th>
<th>Free from other risk of bias</th>
<th>Total</th>
</tr>
</thead>
</table>

EPOC, Effective Public and Organised Care Group; RCT, randomised controlled trial; CDA, controlled before and after study.

Legend: ? = yes; = no; ? = unclear.
<table>
<thead>
<tr>
<th>Study, country</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
<th>Clinical significance (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mazić et al. (1995)</td>
<td>n.s. 843</td>
<td>IG: 75% CG: 73%</td>
<td>IG: 48.9 kg (10-2) CG: 48.6 kg (12-2) CG: 50.9 kg (3-5)</td>
<td>At 12 months: IG 67% in IG, 67% in CG. At 10 months: IG 62% in IG, 64% in CG.</td>
</tr>
<tr>
<td>Marsch et al. (2003, Switzerland)</td>
<td>n.s. 122</td>
<td>IG: 79% CG: 68%</td>
<td>IG: females 49 (10-2), males 48 (8-14) CG: females 49 (10-1) males 49 (8-14)</td>
<td>At 12 months: IG 65% in IG, 65% in CG. At 10 months: IG 62% in IG, 64% in CG.</td>
</tr>
<tr>
<td>Bolliger et al. (2005, Italy)</td>
<td>n.s. 110</td>
<td>IG: 49% CG: 56%</td>
<td>Overall: 54.2%, IG: 69.3%, CG: 55.5%</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Weight-loss interventions in primary-care patients delivered by primary-care physicians**

- **Participants:**
  - **IG:** 75% CG: 73% IG: 48.9 kg (10-2) CG: 48.6 kg (12-2) CG: 50.9 kg (3-5)
  - **Marsi et al. (2003, Switzerland):**
    - IG: 79% CG: 68% IG: females 49 (10-2), males 48 (8-14) CG: females 49 (10-1) males 49 (8-14)
  - **Bolliger et al. (2005, Italy):**
    - IG: 49% CG: 56% Overall: 54.2%

- **Intervention:**
  - **Mazić et al. (1995):** Three 30-min sessions were delivered by dietitians to general practitioners and practice nurses. Training included clinical benefits of weight loss and effective treatments including reduction of energy intake, increased physical activity and pharmaceutical interventions. Participants were encouraged to use protocols and tools used in practice to support weight management protocols used on this model. IG (n=31): Practices were asked to provide social care to their patients.
  - **Marsi et al. (2003, Switzerland):** IG in 65% IG: group treatment sessions focused on nutrition and lifestyle (BASEL) were delivered by physicians. Sessions were delivered according to standardized protocols and covered nutrition, eating behavior, physical activity, social competence and body image IG (n=77): Participants completed non-specific questionnaires about general measures to lose weight.
  - **Bolliger et al. (2005, Italy):** IG in 50% The PAGE protocol is a method of physical activity counseling tailored to participants' stage of change. Patients completed a PAGE assessment form and received counseling by their GP (about 1.5-2min). Patients were asked to create a plan for physical activity. IG 2-3 weeks follow-up was conducted by phone or mail. IG (n=30): Usual care was provided.

- **Retention rate:**
  - **Mazić et al. (1995):** At 12 months: IG 67% in IG, 67% in CG. At 10 months: IG 62% in IG, 64% in CG.
  - **Marsi et al. (2003, Switzerland):** At 12 months: IG 65% in IG, 65% in CG. At 10 months: IG 62% in IG, 64% in CG.
  - **Bolliger et al. (2005, Italy):** At 5-6 months: IG 87% CG: 87.3% At 5-6 months: IG 87% CG: 87.5%
| Study, country | Comorbidities | n | Sex (%) | Age (years) | BMI (kg/m²) | Intervention details | Intensity | Intervention length | Retention rate | Summary | Clinical significance (FN|IDNIR) |
|---------------|---------------|---|----------|-------------|-------------|---------------------|-----------|---------------------|---------------|---------|----------------------|
| Martin et al. (2006)²⁴; Martin et al. (2008)²⁵, USA | n.s. | 114 | 100 % | | | All physicians received 2% of training on general obesity treatment based on the NHLBI clinical guidelines on obesity. IG physicians received an additional 7% of training. IG (n=77): Participants received six-monthly waist circumference (losing >15 mm). Physicians received a protocol prior to visits and participated in an individual written examination on their patients. Recommendations were prepared by multidisciplinary teams with input by physicians. Recommendations were tailored to the cultural background and socio-economic status of patients. IG (n=73): Usual care was provided | Moderate | 9 months | 18 months | IG: 57.6% (66/71) at 9 months CG: 45% (67/179) at 9 months | IG: 14.4% (9/66) kg at 9 months CG: 11.5% (9/50) kg at 9 months | N |
| Christian et al. (2008)²⁶, USA | T2DM | 310 | 65 % | 59.0 | 53.4 | T2DM: 65% (n=155): Tailored feedback was provided to patients (4-5 pages) and their GP (brief summary) based on a computer assessment of patients' readiness to change their physical activity and dietary intake and self-monitoring goals. Participants also received a 38-page planning guide. GP provided brief motivational interviewing. Follow-up consultations were held at 3, 6, and 9 months post-baseline, and at these visits GP reviewed patients' progress with the goals they had set CG (n=155): Participants received a package of health education materials | Low | 12 months | 12 months: IG 61.6% (14/15) CG: 53.2% (13/65) | IG: 15.1% (2/13) kg CG: 11.25% (2/13) kg | N |
Table 2: Continued

<table>
<thead>
<tr>
<th>Study, country</th>
<th>Comorbidities</th>
<th>n</th>
<th>Sex (F/M)</th>
<th>Age (years)</th>
<th>BMI (kg/m²)</th>
<th>Intervention details</th>
<th>Intensity</th>
<th>Intervention length</th>
<th>Retention rate</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schuster et al. (1990)**   USA</td>
<td>n.s.</td>
<td>661</td>
<td>Overall 56%</td>
<td>Overall 32% aged 16-49; 42% aged 46-65; 26% aged &gt;65</td>
<td>DNRI</td>
<td>All physicians received physician training and patient materials. Physicians were asked to place a sticker in the chart of all patients who met criteria for obesity and noted the patient's name. Physicians were also asked to refer patients to a dietitian if appropriate.</td>
<td>Low</td>
<td>1-on-1</td>
<td>Could not assess</td>
<td>At 12 months, IU/L (1.91); C (1.46)</td>
</tr>
</tbody>
</table>

*NP, percentage of females; Y, yes; N, no; DNRI, did not report; n.s., not specified; TIDM, type 2 diabetes mellitus; IG, intervention group; CG, control group; NHLBI, National Heart, Lung, and Blood Institute; SES, socioeconomic status; GP, general practitioner; W, weight gain; LM, weight loss.

**Comparison between IG and CG: **p < 0.01, ***p < 0.001.

*Total participants not equal to 661 as non-randomized intervention arm excluded.

**Change in BMI reported as authors did not report change in weight.

Discussion

The present review identified three different interventions that met the specified inclusion criteria. The study design for one study did not specify inclusion criteria. The number of studies included in the review was limited, as no studies were included in the review. The review found that neither physical activity nor weight change in isolation was effective in achieving significant weight loss. Only one study examined a multi-component intervention, which included physical activity and lifestyle behavior change. The study found that significantly more weight loss was achieved in the intervention group compared to the control group. The results of the review suggest that a multi-component intervention may be more effective than physical activity alone in achieving significant weight loss. Further research is needed to determine the most effective intervention for weight loss.
Table 1: Weight-loss interventions in individuals aged 60 years and older by intervention type.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Weight Loss at 6 Months</th>
<th>Weight Loss at 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>5.2%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Group B</td>
<td>7.8%</td>
<td>15.6%</td>
</tr>
<tr>
<td>Group C</td>
<td>12.3%</td>
<td>22.1%</td>
</tr>
</tbody>
</table>

Note: Data presented as percentage weight loss.
<table>
<thead>
<tr>
<th>Study, country</th>
<th>Characteristics</th>
<th>n</th>
<th>Sex (%)</th>
<th>Age (yrs)</th>
<th>BMI (kg/m²)</th>
<th>Intervention details</th>
<th>Intensity</th>
<th>Duration</th>
<th>Retention</th>
<th>Summary</th>
<th>Clinical</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lee et al., (2008)**, USA</td>
<td>HT, Dysl.</td>
<td>167</td>
<td>50.4%</td>
<td>55-65</td>
<td>23-26</td>
<td>All patients had a baseline screening where weight, height, metabolic measurements were collected and a lifestyle questionnaire was administered (IQ; 2x26). One visit (approximately 16 min) with an NP to discuss results from screening. (IQ; 2x26) The NP had 40% of training using standardized computer software that contained instructions on lifestyle counseling. Patients received four individual visits and one feedback session by telephone by the NP in the first year.</td>
<td>Moderate</td>
<td>12 months</td>
<td>At 12 months:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tai et al., (2010)**, USA</td>
<td>n.s.</td>
<td>50</td>
<td>51%</td>
<td>47-60</td>
<td>27-31</td>
<td>IG: 36 (pre-12)</td>
<td>6 months:</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 3 Continued**
### Table 3 Continued

<table>
<thead>
<tr>
<th>Study, country</th>
<th>Countries</th>
<th>n</th>
<th>Sex (%F)</th>
<th>Age (years)</th>
<th>BMI (kg/m²)</th>
<th>Intervention details</th>
<th>Intensity</th>
<th>Intervention length</th>
<th>Retention rate</th>
<th>Summary</th>
<th>Clinical significance (Y/N/CH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apel et al, (2011) USA</td>
<td>IT, HC, TEDM</td>
<td>415</td>
<td>IG1: 32-3%</td>
<td>IG1: 55.6 (50-9.7)</td>
<td>IG1: 32.0 (50-4.7)</td>
<td>IG1: 32.6 (50-6.12)</td>
<td>IG1: 35.5 (50-5.14)</td>
<td>IG1 (n=192): Participants were encouraged to log on weekly to a website designed to help with weight loss. Those who had not logged in for 7d received an email reminder. Weight loss coaches encouraged participants to complete the modules on the website. 12 sessions by phones were offered to participants for the first 3 months. Participants received one call a month for the remainder of the intervention. IG2 (n=193): Participants were encouraged to log on weekly to the above website and received reminder emails similar to IG1. Participants received nine in-person group sessions and three individual sessions for the first 3 months, and three monthly contacts for the rest of the intervention. IG3 (n=190): Participants met with a weight-loss coach at baseline and received bi-weekly and a list of recommended websites. For the intervention groups, PCPs received a progress report on their patients. Reminder letters were sent on behalf of PCP if participants were not engaged in the study.</td>
<td>High</td>
<td>24 months</td>
<td>At 6 months:</td>
</tr>
</tbody>
</table>

**Results:**
### Table 3 Continued

<table>
<thead>
<tr>
<th>Study, country</th>
<th>Camouflage</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
<th>Clinical significance (P-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>Sex (%)</td>
<td>Age (years)</td>
<td>BMI (kg/m²)</td>
</tr>
<tr>
<td>Jede et al. (2011) Australia, Germany, and UK</td>
<td>General obesity, diabetes, cardiovascular disease, hypertension, depression, anxiety, sleep disturbance, social isolation, low self-esteem, low mood, and reduced physical activity</td>
<td>772</td>
<td>68%</td>
<td>18-60</td>
<td>16.9 ± 1.4</td>
</tr>
<tr>
<td>Warden et al. (2011) USA</td>
<td>At least two components of the MetS</td>
<td>290</td>
<td>55%</td>
<td>52-60</td>
<td>28.6 ± 2.3</td>
</tr>
</tbody>
</table>

*IG = intervention group; CG = control group; % = percentage of participants; kg = kilograms.*

**5% of participants did not reach the target weight loss.**

Comparison between IG and CG: *P* < 0.05, **P** < 0.01, ***P*** < 0.001.

*Total participants who received medication were excluded.*
Table 4: Multi-component weight-loss intervention in primary-care patients

<table>
<thead>
<tr>
<th>Study, country</th>
<th>Comorbidities</th>
<th>n</th>
<th>Sex (%F)</th>
<th>Age (years)</th>
<th>BMI (kg/m²)</th>
<th>Intervention details</th>
<th>Intensity</th>
<th>Intervention length</th>
<th>Retention rate</th>
<th>Summary</th>
<th>Clinical significance (Y/N/DNR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eth et al (2006) USA</td>
<td>n/a</td>
<td>107</td>
<td>M: 71%</td>
<td>CG: 50 (21-15)</td>
<td>CG: 36 (21-7)</td>
<td>All physicians received training and clinical guidelines.</td>
<td>High</td>
<td>3 months</td>
<td>At 60%: 63% At 180%: 50%</td>
<td>DNR</td>
<td><strong>P = 0.01</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Components were derived using the general principles of the chronic care model. This included: (i) clinical information systems consisting of an electronic registry of patients with regular updates provided to physicians and obesity care recommendations; (ii) decision support to physicians via the electronic registry; and (iii) self-management support for patients. Patients also received biweekly telephone-based counseling from counselors for the first 3 months. Counseling was structured using motivational interviewing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*F, percentage of females; Y, yes, N, no; DNR, did not report; n/a, not specified; IG, intervention group; CG, control group; %, weight loss.

To convert % to kg, multiply % by 0.05.

Comparison between IG and CG: "**P < 0.01"
Overall, the studies were of moderate to good quality. One study met all EPQC quality criteria. Two criteria which were poorly met across studies were selective outcome reporting and adequately protecting against contamination.

Only four studies included in the present review had published a study protocol. Selectively reporting positive or statistically significant findings can lead to overestimation of treatment effects, subsequently affecting conclusions drawn from systematic reviews and meta-analyses. Dwayne et al. reported that discrepancies between protocol or trial registries and publications occur in a large proportion of studies, where at least one primary outcome was changed, introduced or omitted in 4–50% of trial reports. Where a protocol does not exist, it is unknown whether selective outcome reporting occurred. Therefore, for a large number of studies included in the present review, the criterion related to selective outcome assessment could not be adequately assessed.

All studies except two used patients or physicians within the same practices as the unit of randomization, thus increasing the likelihood of contamination between experimental and control groups. In some studies, the effect size of the intervention due to the unintentional provision of additional care to control groups. In order to improve the validity of findings, strategies need to be in place to ensure that the control group is not exposed to components of the intervention.

Selective outcome reporting and potential contamination may have affected findings from the included studies. Furthermore, poor reporting of study methodology in some studies made it difficult to assess study quality. These methodological and reporting shortcomings have been similarly reported in other reviews on weight loss.

Of studies examining lifestyle counselling delivered by primary-care physicians, interventions that produced statistically significant weight loss included the use of a structured and tailored protocol to assist physicians with delivery of weight-loss counselling. Consistent with current evidence, regular contact between patients and physicians was a key component in producing weight loss, with higher-intensity interventions reporting larger amounts of weight loss. This contact may not need to be one on one; one study reported that group counselling sessions were effective in producing significant weight loss. While one of the effective interventions was low-intensity (one off contact with physician), the amount of BMI change reported at 3–6 months follow-up was marginal. The author reported that highly motivated patients were enrolled in the intervention group with a large proportion of patients being in the contemplation and preparation stages of change and may not have been reflective of usual primary-care patients.

The two studies targeting providers did not report achieving any significant weight loss in their patients. Of the two, one was a high-intensity intervention. Although classified as high intensity, the intervention relied on practitioners’ delivery of the proposed weight-loss model (this entailed that practitioners saw their patients once every fortnight until they had lost 10% of their initial body weight). The authors noted that practitioners’ adherence to the intervention protocol was low, thus intensity could not be accurately estimated.

While a structured protocol to assist practitioners with delivery of weight-loss counselling appeared effective in producing some weight loss in overweight or obese patients, none of the interventions reported achieving clinically significant weight loss, making it questionable whether physician-delivered interventions alone are worth implementing in primary care.

In studies where non-physicians delivered the intervention, lifestyle counselling was conducted by allied health-care providers (nurses, dietitians) or non-health-care providers (weight-loss counselours, medical assistants).

Two studies included a web-based component in addition to intensity lifestyle counselling. Of these two, one used the web-based component in combination with referral to a community-based weight-loss programme (WeightWatchers®) and the other with in-person or telephone support from weight-loss coaches. Both studies utilised similar high-intensity interventions, with regular contact with health coaches or group leaders and Internet-based systems to help with self-monitoring and provide peer support. For both studies, participants in the intervention group lost significantly more weight than the control group (mean weight loss of approximately 6 kg). Appeled et al. reported no significant difference in amount of weight loss between face-to-face and telephone support, suggesting there is potential for telephone counselling to be delivered as part of weight-reduction programmes to minimise intervention cost.

Findings from studies where non-health-care providers delivered weight-management counselling were mixed. Tai et al.’s high-intensity intervention reported that significantly more weight loss was achieved in the intervention group compared with the control group, whereas studies by Wadden et al. and Logue et al. reported no significant difference in amount of weight loss between the intervention and control groups. Notably, the latter study compared the intervention with an ‘augmented usual care group’, where participants in the control group met with a dietitian for 10 min biannually. This could have affected the control group’s behaviour, thus making it harder to demonstrate an intervention effect.

These findings tentatively suggest that high-intensity interventions delivered by non-health-care providers in a straightforward manner to primary-care physician consults are effective in producing clinically significant weight loss.

In studies involving allied health-care providers, the way in which weight-loss counselling was conducted
Weight loss interventions involving primary-care physicians varied depending on the personnel delivering the intervention. Where the dietitian was involved, delivery of the intervention largely relied on the dietitian to provide individualised advice and weight-loss strategies. In contrast, nurse practitioners used a structured software program to assist with delivery of weight-loss counselling. Both Pritchard et al. and ter Bogt et al. reported significantly more weight loss in the intervention group than the control group; however, only the Pritchard study involving dietitian-delivered advice reported that clinically significant weight loss was achieved. Pritchard et al.’s study highlighted the advantage of physician involvement in addition to dietitian-delivered care in increasing retention rates and proportion attending all sessions of the intervention.

Other studies confirmed the effectiveness of dietitian-delivered interventions. Ashley et al. compared three interventions and found that dietitian-delivered advice coupled with meal replacements was effective in producing clinically significant weight loss compared with either receiving dietitian advice alone or using meal replacements coupled with primary-care physician and nurse practitioner counselling. Analysis was conducted only on participants who completed the intervention. Therefore, treatment effect may have been overestimated.

Despite this limitation, the study suggests that the use of meal replacements in conjunction with dietitian advice is useful in producing significant weight loss. Willaim et al. found no difference in the effectiveness of dietary counselling delivered by a primary-care physician compared with dietary counselling delivered by a dietitian. Both groups had significant weight loss from baseline at 12 months, despite the primary-care physician spending less time during consultations than the dietitian.

Regardless of level of intervention intensity, dietitian-delivered counselling was effective in producing weight loss ranging from 5 to 6 kg. Dietitians receive specialist training in nutrition assessment and counselling for weight loss and may therefore be more equipped to provide weight-management advice.

Findings from these studies suggest that high-intensity interventions involving non-physicians, with primary-care physicians playing a supportive role of assessment and referral, may be more effective than advice delivered by primary-care physicians alone in producing significant weight loss in overweight and obese primary-care patients. Comparisons made here, however, are limited by differences in intensity of intervention, with most primary-care physician-delivered interventions being of low to moderate intensity and non-primary-care physician-delivered interventions being of moderate to high intensity. These differences are likely to reflect clinical practice as primary-care physicians often face the need to deal with more acute issues and have less time to spend on delivery of lifestyle advice. The involvement of dietitians, non-health professionals or commercial weight-loss programmes enables intensive targeted counselling specifically dealing with weight management to be delivered to patients.

One study examined the use of a multi-component intervention which included an electronic registry, decision support and motivational interviewing delivered via telephone by a master’s level weight-loss advisor. That study reported no statistically significant weight loss between the intervention and control group. The small sample size (n=103), short follow-up length and high dropout rate made it difficult for any conclusions to be drawn.

**Practice implications**

Findings reported here suggest that intensive interventions delivered by non-physician personnel in the primary-care setting are effective in achieving clinically significant weight loss. There is insufficient evidence to suggest that counselling delivered by primary-care physicians alone produces clinically significant reductions in weight. However, involvement of primary-care physicians appears to increase retention rates and uptake of interventions delivered by non-physicians. Approaches where non-physician providers play a more intensive role in delivery of behavioural interventions, accompanied by regular monitoring from primary-care physicians, could be a promising strategy to reduce obesity in primary-care patients. Given this finding, a review focused on assessing interventions solely delivered by non-primary-care physicians should be conducted to further inform weight management in this setting. The use of web-based interventions and meal replacements in conjunction with behavioural counselling (delivered by trained non-health providers or commercial centre weight-loss staff) appears promising. Additionally, delivery of interventions by dietitians appears effective regardless of intensity. With only few methodologically rigorous studies conducted, more studies evaluating the effectiveness of these interventions are needed. Future studies should also attempt to evaluate the acceptability, preference and uptake of these strategies among overweight and obese primary-care patients.

**Limitations**

The search terms used may not have identified all relevant studies. However, given the number of records extracted and the small proportion of relevant articles, it is likely that the majority of relevant articles were identified. The chance of missing relevant studies was further reduced by hand searching reference lists of relevant articles. Studies that examined behavioural interventions delivered in conjunction with medication were not examined as it was beyond the scope of the review.

**Conclusions**

Overall, the few studies identified and heterogeneity of interventions utilised made it difficult for conclusions to
be drawn regarding what interventions are most effective in producing weight loss in overweight or obese primary-care patients. Given the burden of excess weight on the population and the advantage of using primary care to target weight loss, there is a need for more research exploring the use of this setting for delivery of weight-loss interventions. Results suggest that counselling delivered by non-physicians (face-to-face or telephone) with support from primary-care physicians is effective in producing weight loss. More studies assessing the effectiveness of these types of interventions are needed to confirm this.

Acknowledgements

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Acknowledgements

The authors wish to thank Shilo Rose for her assistance with screening for relevant articles.

References

Weight-loss interventions involving primary-care physicians


APPENDIX 5.2: STATEMENTS OF CONTRIBUTION FROM CO-AUTHORS

Statement of contribution

I, Dr Mariko Carey, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript:


14/04/2013

Dr Mariko Carey (Co-author)

14/04/2013

Sze Lin Yoong (Candidate) Date

06/05/2013

Professor John Rostas (Assistant Dean, Research Training) Date
Statement of contribution

I, Laureate Professor Robert Sanson-Fisher, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript:


14/04/2013

Laureate Professor Rob Sanson-Fisher (Co-author)  Date

14/04/2013

Sze Lin Yoong (Candidate)  Date

06/05/2013

Professor John Rostas (Assistant Dean, Research Training)  Date
Statement of contribution

I, Alice Grady, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript.


14/04/2013

___________________________________________
Alice Grady (Co-author) Date

14/04/2013

___________________________________________
Sze Lin Yoong (Candidate) Date

06/05/2013

___________________________________________
Professor John Rostas (Assistant Dean, Research Training) Date
APPENDIX 5.3: SEARCH TERMS USED IN DATABASES

Medline search (n=912) – Search entitled “2011-12-01 Obesity search”

1. exp Obesity/

2. (obe$ or overweight$).ti,ab

3. Weight Loss/

4. 1 or 2 or 3

5. Randomized Controlled Trial/

6. Random allocation/


8. Exp clinical trial/

9. Comparative study/

10. Exp evaluation studies/

11. Intervention studies

12. Random$.ti,ab.

13. Controlled clinical trial.pt

14. 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13

15. Practice Guidelines as Topic/

16. Guideline Adherence/
17. Education, Continuing/

18. Physician’s Practice Patterns/

19. Physician-patient relations/

20. Clinical practice.mp

21. Patient compliance/

22. 15 or 16 or 17 or 18 or 19 or 20 or 21

23. 4 and 14 and 22

24. Limit 24 to English and humans

**EMBASE search**

1.  exp Obesity/

2.  (obe$ or overweight$).ti,ab

3.  Weight Loss/

4.  1 or 2 or 3

5.  Randomized Controlled Trial/

6.  Random allocation/


8.  Exp clinical trial/

9.  Comparative study/
10. Exp evaluation studies/

11. Intervention studies

12. Random$.ti,ab.

13. Controlled clinical trial.pt

14. 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13

15. Practice Guidelines as Topic/

16. Guideline Adherence/

17. Education, Continuing/

18. Physician’s Practice Patterns/

19. Physician-patient relations/

20. Clinical practice.mp

21. Patient compliance/

22. 15 or 16 or 17 or 18 or 19 or 20 or 21

23. 4 and 14 and 22

24. Limit 24 to English and humans

**PsycINFO search**

1. Exp Obesity/

2. Exp Overweight/

3. Obes$.ti,ab
4. Exp Weight Loss/

5. 1 or 2 or 3 or 4

6. Exp Clinical Trials/

7. Randomised controlled trials.mp

8. Comparative studies.mp

9. Controlled clinical trials.mp

10. Exp Intervention/

11. 6 or 7 or 8 or 9 or 10

12. Exp Physicians

13. Exp Primary Health Care/

14. Exp Family Physicians/

15. Family practice.mp

16. General pract$

17. Exp General Practitioners/

18. 12 or 13 or 14 or 15 or 16 or 17

19. 5 and 11 and 18

**Cochrane Database search**

“Obesity” + “primary care” + “weight loss” in the Cochrane Central Register of Controlled Trials (limit to Clinical Trials)
SCOPUS search

“Obesity” + “primary care” + “weight loss” – limit to 1999 to current + English
APPENDIX 6: PAPER 6
APPENDIX 6.1: PUBLISHED MANUSCRIPT

Citation

A cross-sectional study assessing Australian general practice patients’ intention, reasons and preferences for assistance with losing weight

Sze Lin Yoong1*, Mariko Leanne Carey1, Robert William Sanson-Fisher1 and Catherine Anne D’Este1,2

Abstract

Background: The high prevalence of overweight and obesity in the population is concerning, as these conditions increase an individual’s risk of various chronic diseases. General practice is an ideal setting to target the reduction of overweight or obesity. Examining general practice patients’ intentions to lose weight and preferences for assistance with managing their weight is likely to be useful in informing weight management care provided in this setting. Thus, this study aimed to: 1) identify the proportion and characteristics of patients intending to change weight in the next six months; 2) reasons for intending to change weight and preferences for different modes of weight management assistance in overweight and obese patients.

Methods: A cross-sectional study was conducted with 1,306 Australian adult general practice patients. Concurring patients reported via a touchscreen computer questionnaire their demographic characteristics, intention to lose weight in the next six months, reasons for wanting to lose weight, preferred personnel to assist with weight loss and willingness to accept support delivered via telephone, mobile and internet.

Results: Fifty six percent (n = 731) of patients intended to lose weight in the next six months. Females, younger patients, those with a level of education of trade certificate and above or those with high cholesterol had significantly higher odds of intending to lose weight. “Health” was the top reason for wanting to lose weight in normal weight (38%), overweight (57%) and obese (72%) patients. More than half of overweight (61%) or obese (74%) patients reported that they would like help to lose weight from one of the listed personnel, with the dietitian and general practitioner (GP) being the most frequently endorsed person to help patients with losing weight. Almost 90% of overweight or obese participants indicated being willing to accept support with managing their weight delivered via the telephone.

Conclusions: Most overweight or obese general practice patients intended to lose their weight in the next six months for health reasons. Younger females, with higher level of education or high cholesterol had significantly higher odds of reporting intending to lose weight in the next six months. An opportunity exists for GPs to engage patients in weight loss discussions in the context of improving health. Interventions involving GP and dietitians with weight management support delivered via telephone, should be explored in future studies in this setting.

Keywords: Obesity, Weight management, Family practice

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Background
Overweight and obesity are modifiable risk factors for a range of chronic diseases and are highly prevalent conditions in developed countries including Australia [1] and United States (US) [2]. General practice represents a promising setting to target the management of excess weight. A large proportion of the population see their GP at least once a year and of those presenting for care, approximately 60% are overweight or obese [3]. Primary care guidelines recommend that GPs assess for overweight or obesity and initiate high intensity counselling and behavioural interventions for those overweight or obese [4,5]. Despite this little is known about the intentions, preferences and acceptability of weight management interventions amongst overweight or obese primary care patients. Previous studies have reported that characteristics such as sex, age, body mass index (BMI), ethnicity, socioeconomic status, number of physician visits and presence of chronic conditions are associated with current or previous attempts to lose weight [6,7]. There is, however, limited literature examining demographic and clinical characteristics associated with intentions to lose weight. Identifying the proportion and characteristics of those intending to lose weight is important to provide GPs with an indication of which patients are most likely to be responsive to discussions about weight loss strategies.

A patient-centred approach is recommended for all areas of health care. This involves provision of care, which is responsive to the needs, values and preferences of the patient [8]. Therefore, identifying what motivates patients to want to lose weight is likely to be important in informing the delivery of patient-centred weight management. Previous studies, conducted with participants enrolled in weight loss trials, have identified improving health and appearance as main motivators for wanting to lose weight in those overweight or obese [9-12]. In contrast to those recruited into weight loss trials with strict eligibility criteria, general practice patients presenting for care are likely to be a more heterogeneous population, with different levels of motivation to change their weight. Further, those with elevated cardiovascular health problems are also likely to be excluded from clinical weight loss trials [13]. Hence data on the acceptability and preferences for intervention derived from such trials may not be generalisable to all patients in the primary care setting. While weight loss is not recommended for those of normal weight, a substantial proportion of those who are normal weight still report trying to lose weight [14]. Examining reasons for wanting to lose weight in normal weight patients can inform overall weight management discussions in this setting. Although GPs play an important role in the overall management of overweight and obesity, they lack the time in a busy clinical setting to deliver high intensity interventions that are potentially effective in producing weight loss [15]. As such, the involvement of non-physician personnel or delivery of interventions via different modes may represent a promising way of providing these high intensity interventions to overweight or obese general practice patients [15]. Different types of health care professionals may provide different types of assistance with weight loss, and this may have implications for the acceptability of referrals. Thus, examining the types of personnel that patients would like help from in order to lose weight is crucial to maximise patient uptake of referrals and adherence to recommended strategies.

A number of interventions examining mobile phone, web-based and telephone delivery of weight loss support have reported promising outcomes [16-18]. With the increasing use of these technologies, examining patients’ willingness to accept support delivered via these mediums can provide an indication of the potential uptake of these types of interventions and inform the development of cost-effective interventions.

Therefore, this study aimed to examine the proportion of general practice patients who intended to lose weight in the next six months, demographic and clinical characteristics associated with intention to lose weight and reasons for wanting to lose weight. In overweight or obese patients who indicated intending to lose weight, preferred personnel to assist with weight management and willingness to accept weight management support delivered via telephone, mobile and internet were examined.

Methods
Study design
This cross-sectional study was conducted as part of larger study testing the feasibility of using a touchscreen computer health assessment in general practice patients.

Practice recruitment
The sampling approach is described in detail elsewhere [19]. In summary, practices with more than two full time equivalent GPs and located within 20 km from a university department of general practice within the cities of Newcastle, Sydney and Melbourne were approached.

Patient recruitment
Participants were adult general practice patients aged 18 years and older and judged by the research assistant (RA) as being physically and mentally able to provide informed consent. Patients who were pregnant were excluded from completing the survey assessing weight management practices.

80
Procedure
The RA approached eligible patients in the waiting room about the study. Consent forms were completed by the patients or their carers, and the RA then administered a questionnaire using a portable touchscreen computer, while waiting for their general practice appointment. Patients were able to exit the survey if they were called in for their appointment. The sex of all approached patients was recorded by the RA on a log sheet.

Equipment
Digivey Survey Suite software (CREOSO - Digivey Survey Center, Phoenix, Arizona) was used to program the patient survey. The survey was administered using Dell Latitude XT2 touchscreen laptop computers.

Measures
The questionnaire was pilot tested with behavioural researchers and 30 general practice patients (see Additional file 1 for questionnaire).

Demographics
Participants provided information on their age, sex, ethnicity, level of education.

Presence of weight-related chronic conditions
Patients reported whether they had high blood pressure, high cholesterol, heart problems, high blood sugar/glucose or chronic pain.

Sufficient physical activity to meet guidelines
A one-item questionnaire was used to assess whether patients undertook at least half an hour of moderate or vigorous exercise on five or more days a week. This tool has been shown to have 77% sensitivity and 81% specificity when compared to the New Zealand Physical Activity Questionnaire-Long Form [20]. Participants were classified as having insufficient levels of physical activity to meet guidelines if they indicated ‘no’ or ‘not sure’ on the above question.

Smoking status
Participants were asked to report their current smoking status [21] and were categorised as being current smokers if they indicated smoking daily or smoking occasionally.

Depression
The Patient Health Questionnaire-9 (PHQ-9) was used to assess depression. Those who scored ≥10 on this scale were categorised as being clinically depressed [22].

Number of times seen GP
Patients were asked whether they were seeing their usual GP and the number of times they had seen the GP in the past 12 months.

Weight and height
Participants were asked to report their weight in kilograms (kg) or stones and height in feet/centimeters or centimetres. Body Mass Index (BMI) was calculated using weight in kilograms (kg) divided by height in metres squared (m²). Participants were categorised as underweight if they had a BMI <18.5 kg/m², normal weight if they had BMI between 18.5-24.9 kg/m², overweight if they had BMI between 25-29.9 kg/m² or obese if they had BMI ≥30 kg/m² [23].

Intention to change weight in next six months
Participants asked whether they intended to change their weight in the next six months. Response options were “Yes, intend to put on weight”, “Yes, intend to lose weight”, “No, do not intend to change weight” and “Not sure”. The following description was also included with the question “Intending to change weight in this question means that you have considered the benefits and costs of changing your weight. You are planning to make the required changes in the next 6 months in order to achieve this”.

Reasons for weight loss
Patients who indicated intending to lose weight were asked to rank their top three reasons for wanting to do so. A review of the literature was carried out to identify potential reasons for intending to change weight. The response options included: “health reasons”, “to improve my appearance”, “to increase my confidence”, “to increase my physical fitness”, “to achieve my ideal weight”, “currently overweight”, “to feel better”, “to fit into my old clothes” and “other”.

Preferences for professional assistance with weight loss
Patients who indicated intending to lose weight in the next six months were also asked to rank in order of preference which of the listed personnel they would like help from in order to change their weight. Response options included “general practitioner”, “practice nurse”, “dietitian”, “psychologist”, “exercise physiologist”, “surgeon”, “weight loss consultant” and “none of the above”.

Willingness to accept support from different medium deliveries
Participants who indicated intending to lose weight in the next six months were asked if they were willing to accept support with weight management via: a) telephone; b) email; c) short messaging service (SMS); d) a
smart phone/tablet application; e) online chat. Participants could choose "Yes", "No" or "No access".

Ethical approval
Ethical approval for this project was provided by the University of Newcastle Human Research Ethics Committee (HREC) (Approval no: HREC 2009-0341) and ratified by the University of New South Wales (Approval no: HREC 0939/UN1-2009-0341) and Monash University HREC (2009001836).

Statistical analyses
Differences in sex of consenters and non-consenters were compared using Pearson's Chi squared test. Those with a self-reported weight of less than 30 kg and more than 300 kg and/or a self-reported height of less than 120 cm and more than 250 cm were excluded from analyses as these values were perceived to be unrealistic. Those in the underweight group were excluded as there were only a small proportion of patients in this group.

The demographic and clinical characteristics of normal weight, overweight and obese participants were reported and compared using a Chi-square test. The percentage of respondents indicating that they wanted to change their weight in the next six months was reported with 95% confidence interval (CI). Chi square tests were used to investigate the relationship between reporting intending to lose weight and age (18–24 years, 25–44 years, 45–65, ≥65 years), sex (male, female), race (Caucasian/non-Caucasian), education (HSC and below, TAFE and Diploma, Tertiary, Postgraduate); exercise (meet guidelines/did not meet guidelines); smoking (current smoker/not current smoker); depression (PHQ score <10/PHQ score ≥10); number of times seen GP in last 12 months (three or less times, four to six times, seven to 10 times or >10 times); presence of chronic pain, stroke, heart disease, high blood pressure, high cholesterol and type 2 diabetes (yes/no). Age was categorised to more closely match the Bettering the Evaluation and Care of Health Study (BEACH) study, an Australian longitudinal study conducted in general practice [24]. Variables with a p-value of less than 0.25 in the univariate analyses were included in a backward stepwise multiple logistic regression analysis and variables with a p-value of >0.1 on the adjusted Wald test were removed. Odds ratios, 95% CIs and p-values from the multiple logistic regression test variables included in the final model are reported. The number, proportion and 95% CIs endorsing each reason as one of their top or within top three reasons, their preferred personnel to help with losing weight as well as willingness to accept support delivered via different mediums were reported separately for normal weight, overweight or obese general practice patients and compared using Chi-square tests.

All 95% CIs and Chi square tests were adjusted for clustering of individuals within practices using svy, with the jackknife variance option. Statistical analysis was performed using STATA 11.0 (StataCorp LP, College Station, TX USA).

Sample size
This study aimed to invite 1500 eligible patients to participate. Based on a survey consent and completion rate of 85%, this would provide 1275 respondents. Assuming a design effect due to clustering of patients within general practice of 1.2, an effective sample size of approximately 1000 would be obtained. This sample size was estimated to allow prevalence estimates with 95% CIs within ±3% of the point estimate for proportion wanting to lose weight. Estimating that approximately 40% of the sample would report intending to lose weight, this would allow detection of differences in characteristics between patients intending and not intending to lose weight by 9% for binary exploratory variables, with a 5% significance level and 80% power. Of the 40% intending to lose weight (n = 400), 25% (n = 100) would be obese, 35% would be overweight (n = 140) and 40% would be normal weight (n = 160). This would allow the prevalence estimates for reasons for weight loss and preference for assistance with losing weight to be reported with 95% CI within ±3% of the point estimate within these BMI categories.

Results
Overall, 2252 patients were invited to complete this survey. Of those, 352 (16%) were ineligible to participate due to the following reasons: less than 18 years of age (n = 156); did not feel well enough to complete survey (n = 32); could not understand English sufficiently to complete survey, (n = 14) had visual impairment (n = 7) and other unspecified reasons (n = 143). Of those eligible, 1620 (85%) consented to participate in the study and 1,343 patients completed the relevant questions. Almost 3% were excluded (n = 37) as they were underweight and results from 1,306 patients are reported. There were no significant differences in the sex of those who consented (39% male) and did not consent (60% male) (χ² = 0.0140; df = 1; p = 0.747). Of the 1306 patients, 35% (n = 461) were overweight and 23% (n = 299) were obese. There were several differences in characteristics by BMI category in terms of presence of chronic conditions, sex, age and lifestyle risk factors (see Table 1).

Proportion intending to lose weight
More than half (n = 731; 56% [95% CI: 49%, 63%]) of the participants reported intending to lose weight, 38 (3.0% [95% CI: 2.0%, 4.3%]) intended to put on weight and 36% [95% CI: 49%, 44%] (n = 476) did not intend to
Table 1 Demographics characteristics of normal weight, overweight and obese general practice patients included in the study

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Normal weight (n = 546)</th>
<th>Overweight (n = 461)</th>
<th>Obese (n = 299)</th>
<th>Test statistic</th>
<th>Design based degrees of freedom</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 – 24</td>
<td>47 (8.6)</td>
<td>18 (3.9)</td>
<td>11 (3.7)</td>
<td>5.4</td>
<td>(45, 45)</td>
<td>&gt;0.001</td>
</tr>
<tr>
<td>25 – 44</td>
<td>162 (30)</td>
<td>117 (25)</td>
<td>71 (24)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 – 64</td>
<td>169 (31)</td>
<td>172 (37)</td>
<td>122 (41)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 65</td>
<td>108 (19)</td>
<td>154 (33)</td>
<td>95 (32)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n(%) female</td>
<td>378 (69)</td>
<td>233 (51)</td>
<td>186 (62)</td>
<td>11</td>
<td>(1.8, 18)</td>
<td>0.001</td>
</tr>
<tr>
<td>n(%) Caucasian</td>
<td>473 (87)</td>
<td>409 (87)</td>
<td>247 (83)</td>
<td>1.5</td>
<td>(1.8, 18)</td>
<td>0.2</td>
</tr>
<tr>
<td>Number of times previously seen GP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in last 12 months</td>
<td>4.5</td>
<td>(3.5, 30)</td>
<td></td>
<td></td>
<td></td>
<td>0.007</td>
</tr>
<tr>
<td>Level of education (n = 1197)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed HSC and below</td>
<td>212 (40)</td>
<td>156 (43)</td>
<td>136 (44)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAFE or Diploma</td>
<td>87 (17)</td>
<td>65 (15)</td>
<td>53 (19)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>165 (32)</td>
<td>134 (31)</td>
<td>67 (20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postgraduate</td>
<td>42 (8.1)</td>
<td>27 (6.2)</td>
<td>12 (4.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n(%) Insufficient level of physical activity</td>
<td>230 (42)</td>
<td>212 (46)</td>
<td>188 (63)</td>
<td>22</td>
<td>(1.5, 15)</td>
<td>&gt;0.001</td>
</tr>
<tr>
<td>n(%) smokers</td>
<td>57 (10)</td>
<td>49 (11)</td>
<td>33 (11)</td>
<td>0.33</td>
<td>(1.8, 19)</td>
<td>0.5</td>
</tr>
<tr>
<td>n(%) PHQ &gt;10</td>
<td>70 (13)</td>
<td>57 (14)</td>
<td>63 (21)</td>
<td>9.3</td>
<td>(1.6, 18)</td>
<td>0.002</td>
</tr>
<tr>
<td>n(%) with heart disease</td>
<td>47 (8.6)</td>
<td>54 (12)</td>
<td>38 (13)</td>
<td>2.8</td>
<td>(1.7, 18)</td>
<td>0.1</td>
</tr>
<tr>
<td>n(%) with chronic pain</td>
<td>33 (6.0)</td>
<td>35 (7.6)</td>
<td>49 (16)</td>
<td>2.4</td>
<td>(1.7, 19)</td>
<td>&gt;0.001</td>
</tr>
<tr>
<td>n(%) with high blood pressure</td>
<td>112 (21)</td>
<td>162 (35)</td>
<td>154 (52)</td>
<td>50</td>
<td>(1.7, 19)</td>
<td>&gt;0.001</td>
</tr>
<tr>
<td>n(%) with high cholesterol</td>
<td>87 (16)</td>
<td>133 (29)</td>
<td>95 (32)</td>
<td>19</td>
<td>(1.9, 21)</td>
<td>&gt;0.001</td>
</tr>
<tr>
<td>n(%) with type 2 diabetes</td>
<td>18 (3.3)</td>
<td>29 (6.3)</td>
<td>50 (17)</td>
<td>16</td>
<td>(2.0, 22)</td>
<td>&gt;0.001</td>
</tr>
</tbody>
</table>

*Number less than total due to incomplete surveys.
HSC: High school certificate (equivalent to completion of high school); TAFE: Technical and Further Education (equivalent to technical certificate).

change their weight in the next six months. Five percent (n = 61) were unsure whether they intended to change their weight.

Clinical and demographic associates with intending to lose weight

A number of characteristics were associated with intending to lose weight in the next 6 months (see Table 2). Being obese was associated with 20 times the odds of intending to lose weight. Those aged ≥65 years had significantly lower odds of intending to lose weight than those aged 18–24 years. Females or those with a diploma or technical level of education and above were at significantly increased odds of intending to lose weight in the next 6 months compared to those with who had completed high school and below. Having high cholesterol was also significantly associated with intending to lose weight in the next six months. A score of 10 or more on the PHQ-9 was associated with 1.8 times increased odds of intending to lose weight and this was approaching significance (p = 0.05).

Reason for intending to lose weight

The most endorsed top reason for intending to lose weight were for “health” (58%, [95% CI 53, 62]), wanting to “achieve ideal weight” (10%, [95% CI 8.1, 13]) and to “improve physical fitness” (9.7% [95% CI 7.2, 13]). "Health" was the top ranked reason for wanting to lose weight among participants in all BMI categories (see Table 3). This was particularly so for obese participants, with 72%
Table 2 Adjusted odds ratio for demographic and clinical characteristics associated with general practice patients' intention to lose weight in the next 6 months (n = 1197)

<table>
<thead>
<tr>
<th>Variables</th>
<th>n(%) not intending to lose weight</th>
<th>n(%) intending to lose weight</th>
<th>Adjusted odds ratio</th>
<th>95% CI</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI category</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal weight</td>
<td>343 (67)</td>
<td>166 (33)</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>145 (24)</td>
<td>278 (66)</td>
<td>6.6</td>
<td>[48, 93]</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Obese</td>
<td>37 (7)</td>
<td>231 (48)</td>
<td>20</td>
<td>[10, 46]</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>269 (55)</td>
<td>215 (45)</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>294 (58)</td>
<td>474 (62)</td>
<td>3.0</td>
<td>[2.5, 5.1]</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td><strong>Scores on PHQ-9</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>506 (47)</td>
<td>563 (63)</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥10</td>
<td>57 (3)</td>
<td>127 (6)</td>
<td>1.0</td>
<td>[1.0, 3.3]</td>
<td>0.05</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>46 (55)</td>
<td>36 (45)</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-44</td>
<td>127 (37)</td>
<td>218 (63)</td>
<td>1.4</td>
<td>[0.7, 2.8]</td>
<td>0.4</td>
</tr>
<tr>
<td>45-64</td>
<td>173 (40)</td>
<td>264 (50)</td>
<td>1.0</td>
<td>[0.8, 1.3]</td>
<td>0.3</td>
</tr>
<tr>
<td>65+</td>
<td>217 (56)</td>
<td>170 (44)</td>
<td>0.4</td>
<td>[0.2, 0.8]</td>
<td>0.009*</td>
</tr>
<tr>
<td><strong>Presence of chronic pain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>522 (46)</td>
<td>625 (54)</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>41 (9)</td>
<td>65 (16)</td>
<td>1.8</td>
<td>[0.5, 1.3]</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Presence of high cholesterol</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>455 (47)</td>
<td>498 (62)</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>103 (20)</td>
<td>152 (64)</td>
<td>1.6</td>
<td>[1.3, 2.1]</td>
<td>0.001*</td>
</tr>
<tr>
<td><strong>Presence of high blood pressure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>414 (49)</td>
<td>437 (51)</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>149 (17)</td>
<td>253 (63)</td>
<td>1.8</td>
<td>[1.0, 2.5]</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Education (n = 1147)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school education and below</td>
<td>293 (51)</td>
<td>281 (49)</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAFE/Diploma</td>
<td>88 (4)</td>
<td>128 (6)</td>
<td>1.9</td>
<td>[1.3, 2.8]</td>
<td>0.009*</td>
</tr>
<tr>
<td>Tertiary education</td>
<td>150 (59)</td>
<td>230 (61)</td>
<td>2.0</td>
<td>[1.4, 2.9]</td>
<td>0.001*</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>52 (39)</td>
<td>51 (61)</td>
<td>2.5</td>
<td>[1.3, 5.1]</td>
<td>0.01*</td>
</tr>
</tbody>
</table>


*p-value <0.05 indicates significant variables in multiple logistic regression for intending to lose weight in next six months.

*p-value less than 0.05 due to incomplete surveys.

Of those who intended to change their weight in the next six months, 66% [95% CI 60, 71] would like help from one of the personnel. More than half of those overweight (61%) [95% CI 53, 70] or obese (74%) [95% CI 67, 80] indicated health as a top reason for intending to lose weight, compared to 57% of overweight and 38% of normal weight (F(1, 20): 30; p < 0.001). All other reasons were endorsed by less than 10% of obese patients as top reasons for intending to lose weight. More than 10% endorsed "achieve ideal weight" as a top reason for wanting to lose weight in the overweight group. In the normal weight group, more than 10% reported that "achieve ideal weight", "increase fitness" and "improve appearance" as top reasons for intending to lose weight.

Similarly, when the top three ranked reasons for losing weight were examined, "health", "achieve ideal weight" and "increase fitness" were the most frequently endorsed by both overweight and obese participants and "increase fitness", "achieve ideal weight" and "improve appearance" most frequently reported by those in the normal weight group. Also worth noting is that almost one third (28%) of the normal weight participants indicated "currently overweight" as one of their top three reasons for wanting to lose weight.

Preferred personnel to assist with weight management

Of those who intended to change their weight in the next six months, 66% [95% CI 60, 71] would like help from one of the personnel. More than half of those overweight (61%) [95% CI 53, 70] or obese (74%) [95% CI 67, 80]
Table 3 Top ranked and ranked within top three reasons for wanting to lose weight in normal weight, overweight and obese general practice patients intending to change weight in next six months

<table>
<thead>
<tr>
<th>Reason for intending to lose weight</th>
<th>Normal weight (n = 176)*</th>
<th>Overweight (n = 299)*</th>
<th>Obese (n = 253)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% (%)</td>
<td>% (%)</td>
<td>% (%)</td>
</tr>
<tr>
<td></td>
<td>[95% CI]</td>
<td>[95% CI]</td>
<td>[95% CI]</td>
</tr>
<tr>
<td></td>
<td>Top reason</td>
<td>Within top 3 reasons</td>
<td>Top reason</td>
</tr>
<tr>
<td>Health</td>
<td>66 (30) [30, 49]</td>
<td>76 (40) [25, 52]</td>
<td>168 (57) [49, 64]</td>
</tr>
<tr>
<td>Achieve ideal weight</td>
<td>23 (13) [9, 20]</td>
<td>63 (47) [40, 54]</td>
<td>36 (12) [8, 17]</td>
</tr>
<tr>
<td>Increase fitness</td>
<td>30 (10) [8, 6]</td>
<td>83 (47) [20, 56]</td>
<td>30 (10) [6, 15]</td>
</tr>
<tr>
<td>Feel better</td>
<td>2 (1) [1, 4]</td>
<td>11 (6) [2, 15]</td>
<td>13 (4) [2, 8]</td>
</tr>
<tr>
<td>Currently overweight</td>
<td>4 (0) [9]</td>
<td>21 (6) [1, 35]</td>
<td>16 (5) [2, 9]</td>
</tr>
<tr>
<td>Fit into old clothes</td>
<td>3 (1) [3, 5]</td>
<td>16 (6) [1, 18]</td>
<td>7 (2) [1, 8]</td>
</tr>
<tr>
<td>Increase confidence</td>
<td>12 (68) [42, 11]</td>
<td>37 (21) [16, 26]</td>
<td>4 (1) [1, 4]</td>
</tr>
</tbody>
</table>

*Net equal to total intending to lose weight due to incomplete surveys.

68, 79] reported wanting help from one of the listed personnel. The preferred person to help with changing overweight and obese patients weight was the dietitian, GP and exercise physiologist (see Table 4).

Acceptability of support delivered via different modes

The majority of participants would be willing to accept weight management support delivered via telephone (almost 90% for both overweight and obese categories – see Table 5). Email and SMS were less well received, with less than half of the overweight or obese patients indicating they would be willing to accept support delivered via these mediums. More than half the patients indicated not having access to smart phones or table devices (57%).

Discussion

Despite the potential benefits of using general practice for interventions targeting overweight and obesity, this study is one of few to describe the demographic associates of patients who report intending to lose weight and the acceptability of weight management interventions delivered via different modes in Australian general practice, to our knowledge. While a large proportion of overweight or obese general practice patients report previously trying to lose weight [14,25], the current literature provides little information on the weight management preferences of these patients. Our study found that females, those with high cholesterol, or those with higher level of education had increased odds of intending to lose weight in the next six months. Overweight and obese patients reported that the most preferred person to help them with losing weight was the dietitian and GP and almost all were willing to accept weight management assistance delivered via telephone.

Being overweight, obese, female and reporting higher levels of education were significantly associated with intentions to lose weight in the next six months. These findings are similar to other research examining associates of those previously trying to lose weight and provide

Table 4 Top ranked personnel to assist overweight and obese general practice patients who intend to lose weight in the next six months with managing their weight

<table>
<thead>
<tr>
<th>Most preferred person to assist with weight management</th>
<th>Overweight (n = 293)*</th>
<th>Obese (n = 251)*</th>
<th>Design based degrees of freedom</th>
<th>Test statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietitian</td>
<td>75 (26) [21, 31]</td>
<td>83 (33) [30, 36]</td>
<td>1 (8) [20]</td>
<td>2.9</td>
<td>0.08</td>
</tr>
<tr>
<td>General practitioner</td>
<td>47 (16) [12, 22]</td>
<td>42 (17) [12, 23]</td>
<td>1 (8) [19]</td>
<td>1.6</td>
<td>0.2</td>
</tr>
<tr>
<td>Exercise physiologist</td>
<td>39 (13) [8, 20]</td>
<td>36 (14) [10, 20]</td>
<td>1 (3) [13]</td>
<td>0.2</td>
<td>0.7</td>
</tr>
<tr>
<td>Psychologist</td>
<td>7 (2) [1, 8]</td>
<td>10 (4) [2, 7]</td>
<td>1 (4) [16]</td>
<td>1.7</td>
<td>0.2</td>
</tr>
<tr>
<td>General practice nurse</td>
<td>9 (0) [3, 3]</td>
<td>4 (1) [1, 5]</td>
<td>0 (0) [2, 0]</td>
<td>0.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Surgeon</td>
<td>9 (0) [0, 4]</td>
<td>2 (0) [0, 3]</td>
<td>1 (1) [12]</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Weight loss consultant</td>
<td>114 (39) [36, 48]</td>
<td>66 (25) [21, 32]</td>
<td>1 (5) [18]</td>
<td>5.9</td>
<td>0.015</td>
</tr>
</tbody>
</table>

*Net equal to total intending to lose weight due to incomplete surveys.

a Total percentage not equal to 100 due to rounding up of figures.
an indication of which patients GPs may be able to initiate weight management discussions with [6,7].

Although intentional weight loss is associated with improved outcomes in those with type 2 diabetes and high blood pressure [26,27], those with these conditions did not have significantly higher odds of intending to lose weight in the next six months. This may be due to the relatively small proportion in the sample that reported having type 2 diabetes (7%). Of the examined weight-related chronic conditions, only presence of high cholesterol was significantly associated with intentions to lose weight. It is possible that patients are not fully aware of the specific benefits of weight loss in improving outcomes such as blood pressure and glycemic control.

Patients may perceive a more direct link between high cholesterol and diet or weight. A qualitative study amongst general practice patients reported that most participants acknowledged an association between diet (especially fat) and high cholesterol and that patients perceived having high cholesterol to be associated with presence of overweight [28]. The link between weight loss or diet and improvements to blood pressure or glucose levels may need to be more clearly communicated to patients either via GPs or through public health messages regarding healthy weight.

All patients wanting to lose weight in the next six months reported health as the top reason. This is consistent with other studies where [29] health reasons were the main motivating factors for attempting weight loss among overweight or obese people [10,12]. Although weight loss in those already in the healthy weight range does not provide increased health benefits, those in the normal weight group similarly indicated that their top reason for intending to lose weight was for health. As those consenting to this survey were asked a variety of screening and health questions, this may have affected participants’ reporting and made it more likely for them to report ‘health’ as a reason for intending to lose weight. Frequent attendees to general practice care may also be more health conscious and thus may have been more likely to choose ‘health’ as a reason for intending to lose weight.

In contrast to other studies involving participants enrolled in weight loss trials [10,12], improving appearance was not endorsed as one of the top reasons for intending to lose weight in those overweight or obese. In the current sample, achieving ideal weight and increasing physical fitness were more frequently endorsed reasons for intention to lose weight than improved appearance. This indicates that reasons for intending to lose weight may differ between general practice patients and those enrolled in weight loss trials.

Overall, 66% of those intending to lose weight indicated that they wanted professional help to do so. The majority rated the dietitian as the preferred person to assist with weight management, followed by GPs and exercise trainers. A previous study identified that patients favoured GP advice compared to dietitian referral [25], while Than and colleagues found that the GP was rated fourth in the list of ideal person nominated to help with weight loss, after personal trainer, dietitian and weight loss consultant [30]. These discrepancies in findings could be attributed to the differences in age range of the included patients [30] or differences in wording of survey items. It is likely that patients’ preferred personnel for assistance with weight loss was influenced by the type of assistance they expect to receive from these personnel. For example, those who indicate wanting help from a dietitian may like assistance with planning their meals or dietary advice. While the specific content area that patients would like help with was not examined in the current study, previous study reported that 80% of Australian general practice patients rated advice on healthy eating and physical activity as useful or very useful for weight loss [20].

Our finding that the dietitian and GP are the preferred personnel for providing assistance for weight loss is encouraging. A randomised controlled trial previously demonstrated that dietitian advice in conjunction with brief advice from a GP is effective in producing clinically

<table>
<thead>
<tr>
<th>Delivery of weight support services</th>
<th>% that have access</th>
<th>Overweight (n = 230)</th>
<th>Obese (n = 255)</th>
<th>Test statistic</th>
<th>Design based degrees of freedom</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>95% CI</td>
<td>n</td>
<td>%</td>
<td>95% CI</td>
</tr>
<tr>
<td>Telephone</td>
<td>100</td>
<td>265</td>
<td>89 [86.91]</td>
<td>723</td>
<td>88</td>
<td>177 [94]</td>
</tr>
<tr>
<td>Email</td>
<td>85</td>
<td>136</td>
<td>45 [40.41]</td>
<td>105</td>
<td>41</td>
<td>36 [47]</td>
</tr>
<tr>
<td>Short messaging service (SMS)</td>
<td>93</td>
<td>128</td>
<td>43 [34.52]</td>
<td>94</td>
<td>37</td>
<td>29 [46]</td>
</tr>
<tr>
<td>Online chat room</td>
<td>116</td>
<td>104</td>
<td>25 [31.30]</td>
<td>66</td>
<td>27</td>
<td>24 [30]</td>
</tr>
<tr>
<td>Smart phone/tablet application</td>
<td>43</td>
<td>80</td>
<td>27 [23.30]</td>
<td>68</td>
<td>27</td>
<td>21 [34]</td>
</tr>
</tbody>
</table>

*Not equal to total intending to lose weight due to incomplete surveys.
* Percentages were of all intending to lose weight that report being willing to accept support via these mediums.
significant weight loss at six months follow up compared to usual care [31]. Additionally, findings from a systematic review indicate that non-physician delivered counselling with regular GP review is effective in producing weight loss [15]. The involvement of exercise physiologists is also likely to be useful in assisting patients with undertaking physical activity. However, longer term, rigorous evaluations of the involvement of exercise physiologists, dietitians and GPs in delivery of weight loss interventions is needed to confirm this.

Almost 90% of overweight or obese patients indicated willingness to accept support with weight management via telephone. This is in line with a previous study in one Australian state, which found that 87% of participants considered it acceptable for a health service to contact people by telephone to assist them with losing weight, eating healthily and being more physically active [32]. The high acceptability of telephone-delivered support may be due to increased familiarity with this mode, as all participants except one had access to a telephone. Patients may also prefer telephone contact to other modes of delivery, as it involves direct interaction with another person and may provide a more 'personal touch'. Coupled with findings that telephone-delivered interventions are effective in changing participant's physical activity levels and dietary intake [16,33], future weight loss interventions in this setting should incorporate telephone contact as method of providing patients with support to lose weight. While more cost-effective than face to face or telephone contact, a lower proportion of patients indicated that they would be willing to accept support via SMS, chat group or email. Some potential reasons for this may be dislike of technology or unlikely to open, read or act on it [32]. Only 27% of overweight or obese patients intending to lose weight indicated being willing to accept support delivered via smart phone or tablet applications. With more than 50% of patients indicating having no access to a smart phone or tablet device, interventions utilizing these devices need to take into account potential access and cost barriers.

Conclusions

Those overweight, obese, younger, females, with a level of education of trade certificate and above and have high cholesterol had higher odds of intending to lose weight in the next six month. The high rates of overweight and obese patients intending to lose weight and that “health” was the top reason for wanting to lose weight confirms that there is substantial opportunity for weight loss discussions to be initiated by GPs in context of weight-related conditions. With over 70% of obese patients expressing a preference for help to lose weight, the involvement of dietitians and exercise physiologists may facilitate the provision of intensive weight management counselling without putting additional burden on GPs. Additionally, intervention delivery via telephone is a promising tool for weight management in this setting.

Additional file

Additional file 1: Health risk assessment survey.

Competing interests

The authors declare that they have no competing interest.

Authors' contributions

SLV was involved in study and questionnaire development, data analysis, interpretation of results and drafting of manuscript. NC and CDE participated in the study design, data analysis, interpretation and drafting of the manuscript. RSF was involved in overall study design, interpretation of results and drafting of manuscript. All authors read and approved the final manuscript.

Acknowledgements

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References


APPENDIX 6.2: STATEMENTS OF CONTRIBUTION FROM CO-AUTHORS

Statement of contribution

I, Dr Mariko Carey, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript:

Yoong SL, Carey ML, D’Este C, Sanson-Fisher R. A cross-sectional study assessing Australian general practice patients' intentions, reasons and preferences for assistance with losing weight.

14/04/2013

Dr Mariko Carey (Co-author)       Date

14/04/2013

Sze Lin Yoong (Candidate)       Date

06/05/2013

Professor John Rostas (Assistant Dean, Research Training)       Date
Statement of contribution

I, Professor Catherine D’Este, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript:

Yoong SL, Carey ML, D’Este C, Sanson-Fisher R. A cross-sectional study assessing Australian general practice patients' intentions, reasons and preferences for assistance with losing weight.

14/04/2013

__________________________________________
Professor Catherine D’Este (Co-author) Date

14/04/2013

__________________________________________
Sze Lin Yoong (Candidate) Date

06/05/2013

__________________________________________
Professor John Rostas (Assistant Dean, Research Training) Date
Statement of contribution

I, Laureate Professor Robert Sanson-Fisher, attest that Research Higher Degree candidate, Sze Lin Yoong, contributed substantially in terms of study concept and design, data collection and analysis, and preparation of the manuscripts to meet British Medical Journal authorship guidelines for the following manuscript:

Yoong SL, Carey ML, D’Este C, Sanson-Fisher R. A cross-sectional study assessing Australian general practice patients’ intentions, reasons and preferences for assistance with losing weight.

14/04/2013

Laureate Professor Rob Sanson-Fisher (Co-author) Date

14/04/2013

Sze Lin Yoong (Candidate) Date

06/05/2013

Professor John Rostas (Assistant Dean, Research Training) Date
APPENDIX 7: ADDITIONAL PUBLICATIONS RELEVANT TO BUT NOT INCLUDED IN THE THESIS
APPENDIX 7.1: PROTOCOL PAPER

Open Access

BMJ open

Touch screen computer health assessment in Australian general practice patients: a cross-sectional study protocol

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ARTICLE SUMMARY

Article focus
- Cross-sectional study assessing the acceptability of the use of a portable touch screen computer in order to assess CVD and cancer-related health risk factors as well as the level of preventive behaviours in general practice patients.

Key message
- With touch screen technology becoming more accessible, there is likely to be increased potential to use these technologies to assist in health risk factor assessment as well as delivery of healthcare advice particularly in general practice.

Methods and analysis:
The study has been designed to maximise recruitment of GPs by including practitioners in the research team, minimising participation burden on GPs and offering remuneration for participation. Patient recruitment will be carried out by a research assistant located in general practice waiting rooms. Participants will be asked regarding the acceptability of the touch screen computer and to report on a range of health and preventive behaviours using the touch screen computer. GPs will complete a one-page survey indicating their perception of the presence of risk behaviours in their patients. Descriptive statistics will be generated to describe the acceptability of the touch screen and prevalence of health risk behaviours. Cohen’s k will be used to assess agreement between GP and patient perception of presence of health risk behaviours.

Ethics and dissemination:
This study has been approved by the human research committees in participating universities. Findings will be disseminated via peer-reviewed publications, conference presentations as well as practice summaries provided to participating practices.

INTRODUCTION
Cardiovascular disease (CVD) and cancer continue to be leading causes of death globally. These diseases are associated with modifiable lifestyle risk factors such as smoking, excessive alcohol consumption, lack of physical activity and being overweight. Recently, depression has also been shown to be an independent risk factor for...
Touch screen computer health assessment in Australian general practice patients

the development of heart disease. Other risk factors for the development of CVD include high blood pressure, high cholesterol and type 2 diabetes. Early detection of cancer through screening tests and early detection of lifestyle and metabolic risk factors for CVD may improve outcomes for these diseases, respectively. Despite this, participation in cancer and cardiovascular screening remains suboptimal, although public health campaigns have been implemented to promote these activities.

General practitioners (GPs) are accessed by a large and relatively representative sample of the population. In Australia, approximately 85% of the population consult their GP each year. Each primary care attendance represents an opportunity to increase awareness about relevant screening and health risks. Furthermore, both GPs and patients perceive preventive care as an important part of a GP's role, suggesting that provision of preventive care in this setting is likely to be acceptable.

Indeed, providing information in relation to preventive care has been demonstrated to be an effective strategy in improving GP awareness and patient knowledge. Primary care clinical practice guidelines recommend that patients be screened for metabolic and lifestyle risk factors for prevention and early management of CVD and other chronic diseases.

Current evidence suggests that screening for cancer and CVD risk factors in line with recommendations will improve outcomes for patients. While GPs play a vital role in screening and management of these risk factors, time and resource barriers may also impact on this process. As well as the need to deal with patients' primary reasons for presenting for care during consultation means that screening does not always occur in line with best practice guidelines. While recall and reminder systems for monitoring of people with an existing chronic disease are becoming more widespread, these are not routinely implemented for preventive care. Therefore, comparison of patient self-report and their GP's perception of the patient's risk status may provide valuable information about whether a quick and systematic method of collecting self-report information on risk behaviours from patients is likely to provide useful information to GPs.

Electronic assessments presented on touch screen computers may be a useful method of providing clinicians with extra information regarding their patients' risk factors in order to assist with delivery of best practice clinical care. Patients indicate a preference for electronic methods of data collection. Touch screen computers are portable, light and can potentially provide patients with more privacy during completion of health surveys compared with a paper and pencil survey. This method has been shown to be as accurate as paper and pencil surveys in recording patient information and may lead to less under-reporting and fewer missing values. Additionally, electronic data collection enables automated data entry and tailoring of survey questions, minimising both provider and patient burden. The use of electronic data collection methods has previously been proven to be acceptable in a variety of settings such as oncology wards and primary care. It has been used to collect a range of self-report information including patient quality of life, psychological distress and pain.

The aim of this study will be to estimate the acceptability and feasibility of collection of health risk information using an electronic questionnaire presented on a touch screen computer in the general practice setting. This will also report on the prevalence of self-reported cancer and cardiovascular risk screening practices, lifestyle risk factors (physical inactivity, alcohol consumption, smoking, obesity or physical inactivity), depression as indicated by a score of 10 or more on the Patient Health Questionnaire-9 (PHQ-9), bone density screening in those aged >70 years and receipt of preconception care and cervical cancer vaccination in women aged <48 years. Lastly, this will report on the level of agreement between GPs and patients regarding whether the patient is depressed, whether the patient has been screened for CVD risk factors and cancer in line with current guideline recommendations and whether the patient has lifestyle risk factors for these diseases.

**Methods**

**Study design**

This study will be a cross-sectional health assessment of approximately 2000–3000 Australian general practice patients.

**Population**

**Selection of general practices**

Defined geographic areas with a radius of approximately 20 km from a university department of general practice will be selected in the following regions of Australia: Newcastle, Melbourne and Sydney. A list of postcodes for each geographic region will be generated using the Australasian Medical Publishing Company Medical Directory of Australia. Randomly selected practices on the list generated for each region will be approached until four practices in each region are recruited. It is anticipated that a final sample of 12 practices will be recruited.

**Eligibility criteria**

General practices will be eligible if at least two full time equivalent GPs consent to participate.

**Piloting of procedures**

Three teams will be responsible for recruitment of practices and data collection: one in Newcastle, one in Melbourne and one in Sydney. Each team will pilot study procedures in one selected convenient practice within their local area. This will be done to ensure standardisation of study methods across sites.

**Recruitment of practices and GPs**

A package containing an invitation letter, information statement, consent form and reply paid envelope will be
mailed out to all individual GPs and the practice manager within each randomly selected practice. Follow-up phone calls will be made to the practices, and additional information will be sent out as well as practice visits undertaken. Recruitment of GPs for research studies is often challenging due to GPs' time constraints, lack of remuneration and workforce shortages. In order to maximise recruitment, we will implement the following strategies as recommended by the Royal Australian College of General Practitioners (RACGP)25—(1) including practitioners in research teams; three GPs (GR, DM and NM) are included as chief investigators on the research team and will be involved in development of the questionnaire and study implementation. The GP investigators will also play a role in advising on the development of recruitment protocols as well as encouraging GP buy-in to the project. (2) Designing studies to reduce demand on GPs; minimal time and participation demands will be placed on participating GPs. Each participating GP is required to complete a simple one-page checklist for only a subset of 35 of their participating patients. Completion of the survey for each patient is expected to take no more than 2–3 min. At the end of the study, GPs will also be asked to complete a one-page questionnaire, assessing the acceptability of the study procedures in the practice. Completion of this survey is one-off and is expected to take no more than 3 min. (3) Facilitating recruitment of patients to minimise time burden placed on GPs to minimise time burden placed on GPs, all patient recruitment study will be carried out by a research assistant based in the practice waiting room. (4) Remuneration: reimbursement will be offered to practices for GP time spent on participation. The amount of reimbursement ranged from $800 (for two participating GPs) to $2000 (five or more participating GPs). Additionally, 40 category 1 Quality Improvement & Continuing Professional Development (RACGP QI & CPD) points will be offered to participating GPs if they chose to do a follow-up audit for their identification of clinical depression.

Participants
Eligibility
Those aged 18 years or older presenting for general practice care, able to complete the touch screen computer survey in English, and physically and mentally able to give informed consent will be eligible to participate in the study. Patients with an intellectual impairment that precludes provision of informed consent and those presenting for care to a non-GP provider within a participating practice will be excluded.

Recruitment procedure
Patients
Two to three touch screen computers will be available in each practice for collection of survey data, depending on patient volume. The touch screen tablets are portable, protect privacy, are robust and can be rested on a patient's lap, thereby overcoming disadvantages of previous technology using standalone computers. Signage and pamphlets will be available in participating practices to encourage patient participation in the study and minimise practice staff time in explaining study procedures.

Eligible patients will be approached by the research assistant and invited to participate in the study. Following informed consent, participants will be asked to complete a health assessment using the touch screen computer in the waiting room prior to their consultation. A brief information statement will appear on the first screen of the questionnaire and patients will be asked to touch 'NEXT' if they are willing to commence the questionnaire. Willingness to complete the survey will be taken as consent to participate. Each consenting participant will be allocated a unique participant ID. Each participant will also be provided with a hard copy patient information statement with their unique ID, printed on the information statements. Consenting participants will be presented with a series of questions on the touch screen and asked to touch 'reply' that represents their answer. A stylus or participant's finger can be used to touch 'reply' the appropriate responses.

The research assistant will record the proportion of consenting, non-consenting and ineligible patients on a recruitment log sheet. For non-consenting participants, the research assistant will also record their sex on a recruitment log sheet in order to assess consent bias.

General practitioners
For a consecutive subgroup of 35 of their participating patients, each GP will be asked to complete a questionnaire assessing the GP's perceptions of each patient's screening and lifestyle risk factors and depression status. The questionnaire will contain the patient's name and date of birth so that it can be linked to patient survey results. The GPs will hand the completed surveys back to the research staff present at the practice. At the end of the study period, GPs will be asked to fill in a short questionnaire asking for feedback regarding the acceptability of using the touch screen computer survey in practice waiting rooms.

Overview of touch screen computer questionnaire
As the recommended frequency of screening for high blood pressure, high cholesterol and diabetes varies depending on family history, age and sex, the electronic health risk assessment will be programmed to allow tailoring to each participant's age, gender and other relevant risk factors such as family medical history. All questions on screening will be based upon the intervals recommended by the RACGP Preventive Care guidelines. Commercial programming software, Digviev survey suite software (CREOSO—Digviev Survey Center, Phoenix, Arizona, USA), will be used to programme the electronic health risk assessment. The survey will be administered using Dell Latitude XT2 touch screen laptop computers.

Variables

Name and date of birth
Participants will be asked to provide their name and date of birth. This information will enable GP’s to identify the patient for which they are providing their perception of health risk status.

Demographics
Participants will report their age, gender, postcode, edinicity, level of education and whether they hold a healthcare concession card.

Personal and family history of chronic diseases
Participants will be asked whether they have ever been diagnosed with high blood pressure, high cholesterol, diabetes, depression, stroke, chronic pain, heart disease or kidney disease. Participants will also be asked if they have a first-degree relative (parent, siblings or children) who had previously been diagnosed with heart disease at <30 years of age.

GQD metabolic risk factor screening
Respondents will also be asked to indicate the timeframe in which they had their last test for blood cholesterol, blood pressure and blood glucose levels if appropriate to age and pre-existing risk factors. Response options will be tailored to RACGP recommendations, which correspond to the participant’s age and pre-existing risk factors for each test. For example, it is recommended that those with a history of heart disease/stroke, gestational diabetes mellitus or prediabetes have their blood glucose checked every 3 years. Participants who report a history of any of the aforementioned conditions will be asked whether they had their blood glucose level checked in the last 4 years, more than 4 years ago, never or not sure. A 1-year leeway will be added to the recommended screening interval to ensure a conservative approach to categorising participants as underscreened.

Cancer screening
Respondents will be asked to indicate the timeframe in which they had their last screening test for colorectal cancer, breast cancer, cervical cancer and melanoma if appropriate to age and gender. Response options will be tailored to the RACGP guideline recommendations corresponding to each patient’s level of risk for the particular test.

Lifestyle risk factors

Physical activity
Level of physical activity will be assessed using a one-item validated questionnaire asking whether participants carry out at least half an hour of moderate or vigorous exercise on 3-5 days/week. This tool has been shown to have 77% sensitivity and 81% specificity when compared with the New Zealand Physical Activity Questionnaire-Long. Participants will be classified as at risk if they indicate that they do not do 30 min of moderate or vigorous exercise at least 3 days/week.

Alcohol
A modified version of the AUDIT-C questionnaire, a three-item alcohol screening tool, will be used to identify participants who are risk drinkers or have active alcohol disorders. Participants who reported having more than two standard drinks on a typical day (chronic drinking) or more than four standard drinks on any drinking occasion (binge drinking) will be considered at risk as defined by the Australian National Health and Medical Research Centre alcohol guidelines.

Smoking
A single question from the New South Wales (NSW) Health Survey will be used to assess smoking status. The question is worded as follows: ‘Which of the following best describes your smoking status? This includes cigarettes, cigars and pipes’. Response options include: 1 = smoke daily, 2 = 1 smoke occasionally, 3 = I don’t smoke now but I used to, 4 = I’ve tried it a few times but never smoked regularly or 5 = I’ve never smoked. Participants will be classified as at risk if they indicate that they smoke daily or occasionally.

Body mass index
Self-reported estimates of weight (in kilograms or stones) and height (in centimetres or feet/inches) will be requested to calculate body mass index (BMI). Participants will be considered overweight/obese if they have a BMI of ≥25 kg/m² and non-overweight if they have a BMI <25 kg/m².

Current depressive symptoms
Depression will be assessed using the nine-item PHQ. This tool has been used in the primary care setting and shows high correlation with functional status score on the SF-20 subscales. A score of ≥10 on this scale has been shown to have a sensitivity of 88% and specificity of 88% for major depression when compared against a mental health professional assessment. Participants will be considered at risk if they have a PHQ score of 10 or above.

Other prevention
Female respondents of reproductive age (18-45 years) will be asked to indicate whether or not they have ever received preconception care (and the nature of that care) and/or cervical cancer vaccination from their GP. Response options will be tailored to the RACGP guideline recommendations. In relation to screening for osteoporosis, men and women aged >70 years will be asked whether they have ever had a bone density test.

Acceptability of the electronic health assessment
The final section of the survey will assess participants’ opinions of the acceptability of the touch screen computer. Participants will be asked if they felt that the survey instructions were easy to follow and easy to understand. If the touch screen provided enough privacy, whether the touch screen was easy and comfortable to use. For each of these questions, participants will be able to respond Yes or No. Participants will also be asked
whether they would be willing to complete a similar touch screen questionnaire (with different questions) each time they presented to a GP and if they would be happy for their doctors to have access to their answers. Participants will be able to respond ‘Yes, No or Unsure’.

**GP surveys**

A one-page paper and pen survey will be used to assess GPs’ perceptions on whether the patient has been screened for high blood pressure, high cholesterol and diabetes and cancer in line with current guideline recommendations, and whether the patient has the following risk factors: depression, current smoker status, risky alcohol consumption, overweight or obese. GPs will be able to select from ‘Yes, No, Unsure or Not Applicable’.

At the completion of the study, each participating GP will be asked to complete a brief questionnaire assessing the acceptability of the implementation of the electronic health assessment within their practice. GPs will be asked whether they thought that the touch screen computer survey could be implemented as part of routine practice, whether it increased patient waiting times or staff burden, whether it was well received by patients, whether it was an acceptable way to collect patient data, whether it was disruptive to the waiting area, whether it was disruptive to the consultation process and whether it prompted patients to ask GPs about issues outside of the primary purpose of the consultation. GPs will be able to select responses on a 5-point Likert scale ranging from ‘Strongly disagree’ to ‘Strongly agree’.

**Statistical methods**

Characteristics of consenting and non-consenting patients will be compared using Pearson’s χ² test for categorical variables. Consent rate will be calculated and descriptive statistics (including number, percentage and 95% CI) for each item on the acceptability questions will be generated to assess acceptability of the use of the touch screen computer health assessment questionnaire. Prevalence of patient-reported appropriate cancer and CVD risk factor screening, depression, bone density testing and receipt of preconception care and cervical cancer vaccination will be calculated with a 95% CI. Level of agreement between patients and GPs perceptions of depression status, appropriate screening and presence of lifestyle risk factors will be calculated using Cohen’s k statistic.

**Study size**

Depending on the size of the practices recruited, 24–30 GPs and 2400–3000 patients will be recruited. A subsample of 200 patients will answer the questions regarding acceptability of use of touch screen computer. It is estimated that this will provide sufficient numbers to estimate rates of acceptability within ±2%. A sample size of 2400 patients will enable the prevalence of the outcomes of interest; CVD risk factor screening, cancer screening, depression, bone density testing and receipt of preconception care and cervical cancer vaccination to be estimated within ±2%. Approximately 30 GPs each completing checklists for 35 of their participating patients will be required. This will provide 80% power, at a significance level of 5% to detect: (1) a χ² of 0.5 or more as statistically significantly >0 for each GP and (2) a χ² of 0.5 as being statistically significantly >0.1 for all GPs (assuming an observed proportion of agreement of 0.3 or more).²⁵

**Ethics and dissemination**

This study protocol has been approved by the University of Newcastle Human Ethics Committee (Approval no: H-2009-0341) and ratified by the University of New South Wales Human Research Ethics Committee (HREC/09/395/UN H-2009-0341) and Monash University Human Research Ethics Committee (2009001830). Participants will be able to withdraw from the study at any time by contacting the research team and quoting their unique participant ID printed on the hard copy information statement. Findings from this study will be disseminated via peer-reviewed publications, conference presentations and reports to funding bodies. Additionally, a summary of findings will be provided to participating general practices.

**DISCUSSION**

This study will enable the collection of valuable information regarding the utility of touch screen assessment tools in the general practice setting. The study is designed to minimise the time burden placed on both GPs and practice staff in order to increase general practice recruitment rates, minimising recruitment bias of practitioners and subsequently patients.

The study will generate one of the largest Australian data sets on self-reported risk factors and current preventive care among general practice patients. It will be one of the first studies to compare the level of agreement between patients’ and GPs’ assessment of risk and thus provide important information that can inform future quality of care initiatives.

While previous studies have assessed the use of touch screen technology in primary care, this study is novel in that it uses portable tablets that can be rested on a patients’ lap instead of large free-standing touch screen kiosks. With touch screen technology becoming more accessible in the form of computer tablets, iPads and smart phones, there is likely to be increased potential to use these technologies to assist in health risk factor assessment as well as delivery of healthcare advice.

**LIMITATIONS**

All practices recruited will be located in urban areas. This study is a cross-sectional study and does not provide information on causal relationship.

**CONCLUSIONS**

Electronic health assessments completed in the waiting room could potentially help GPs with the early detection
and subsequent management of CVD-related conditions, cancer and the organisation and delivery of preventive care—a necessary step in the implementation of evidence-based preventive care. If found to be useful, additional ways of integrating results from self-report tools into existing general practice databases need to be explored.

Author affiliations

9 and subsequent management of CVD-related conditions, cancer and the organisation and delivery of preventive care—a necessary step in the implementation of evidence-based preventive care. If found to be useful, additional ways of integrating results from self-report tools into existing general practice databases need to be explored.

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Contributors SV assisted with development of the questionnaire and drafted the initial manuscript; MLCC, OP, and RI designed the final study protocol, assisted with development of the questionnaire and drafted the initial manuscript. JG-IW conceived the study and designed the study protocol; GR, DW, and AM assisted with questionnaire development and design and technical advice contributed to study design and provided expert statistical advice. All authors read and approved the final manuscript.

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Competing interests None.

Ethics approval Ethics approval was provided by the University of Newcastle Human Ethics Committee.

Prevention and peer review Not commissioned; internally peer reviewed.

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APPENDIX 7.2: LETTER TO THE EDITOR

Citation: Yoong SL, Carey ML, Sanson-Fisher R, D’Este C. Recruitment in general practice. Aus Fam Phys. 2013: 42(9).

Recruitment in general practice

Dear Editor

General practice is an ideal platform for public health researchers as it provides access to a large proportion of the population and enables researchers to target a range of health conditions. While research in this setting is both valuable and essential, difficulties with practice and practitioner recruitment may hinder the development of evidence in this setting. We read Jones et al’s reporting of barriers and enablers to research participation with interest (AJP June 2012). This article provides valuable insight to guide researchers in the future design of recruitment procedures in this setting, particularly with the changing demographics of the workforce.

In our experience with recruitment in this setting, we conducted a cross-sectional study, where we sought practice consent to approach patients in the practice waiting room. Despite the known challenges faced in recruitment of practices in this setting, we found little evidence on how to maximise practice consent rate. We employed a number of strategies in line with those recommended by the NAGP.

References


Letters to the Editor

Letters to the Editor can be submitted via:
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Appendix 7.2.1: Permission to publish Letter to the Editor in Appendix 7.2

13 February 2013

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Priority Research for Health Behaviour
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Yours sincerely,

Meg A’Hearn
Administrator
Australian Family Physician
APPENDIX 8: STUDY MATERIALS
The “General Practice Project”:
Testing the acceptability and feasibility of a system-oriented intervention, involving touch screen computers for reducing health risk factors amongst general practice patients

Participant Recruitment Manual
8.1.1. INTRODUCTION

This manual is designed to provide you with information regarding the “General Practice Project” we are conducting. This manual clearly outlines the study procedures and your role in participant recruitment. This manual should be referred to throughout the entire duration of the project.

Your role in recruiting participants for the project is crucial to the process of data collection. The data collected are very important in helping us determine whether using a computer-based system is a feasible and acceptable way to help general practitioners provide the best quality care.

As part of participant recruitment, you will be responsible for providing relevant information regarding the study to participants, ensuring participants’ privacy is protected and assisting participants with completing the survey. You will also be providing general practitioners (GPs) with the General Practitioner Information Sheet (Appendix 8.3.3), the Waiting Room Poster (Appendix 8.2.2) and the forms that they and their Practice Managers need to complete (Appendices 8.4.2, 8.4.3, 8.5.1, 8.5.2 and 8.6.1).

This manual has been developed to assist you in doing these tasks. Please retain this manual for your future reference.

8.1.2. STUDY BACKGROUND

Cardiovascular disease (CVD) and cancer continue to be leading causes of death in Australia. These diseases are associated with modifiable lifestyle factors such as smoking, excessive alcohol consumption, lack of physical activity and being overweight. Recently, depression has also been shown to be an independent risk factor for the development of heart disease. Other risk factors for the development of cardiovascular diseases include high blood pressure, high cholesterol and diabetes. Early detection of cancer and risk factors for cardiovascular disease may improve health
outcomes and reduce the number of deaths associated with the disease. However, participation in cancer and cardiovascular screening remains sub-optimal, despite public health campaigns to promote these activities.\textsuperscript{2,3} This study will test whether a computer-based approach will provide doctors with additional information that can help with ensuring that their patients receive the best possible care.

**Study rationale**

**Why GP practices?**

General practitioners are accessed by a large and relatively representative sample of the population.\textsuperscript{4} Both GPs and patients see preventive care as an important part of GPs’ role.\textsuperscript{4,5} Each patient’s visit to the GP represents an opportunity to increase awareness about relevant screening and health risks.

**Why use touch screen computers?**

Patients indicate a preference for electronic methods of data collection.\textsuperscript{6} This method has been shown to be as accurate as paper and pencil surveys in recording patient information and may lead to less under-reporting, fewer inconsistencies and fewer missing values.\textsuperscript{7}

**8.1.3. STUDY AIMS**

The aims of this study are to:

a) Assess the acceptability and feasibility of using a touch computer tool to collect patient health information prior to consultation in a general practice waiting room.

b) Determine the prevalence of self-reported CVD risk factors/cancer screening/depression amongst Australian general practice patients.

c) Assess current rates of cancer and CVD risk factor screening in line with primary care recommendations amongst general practice patients.
d) Assess GPs’ perceptions about their patients’ current participation in cancer and CVD screening and lifestyle-related behaviours.

8.1.4. RESEARCH TEAM

This project is a joint collaboration by researchers at the University of Newcastle, University of New South Wales and Monash University.

The members of the research team are as below:

a) Professor Rob Sanson-Fisher, Dr Chris Paul, Dr Kerry Inder, Professor Catherine D’Este, Dr Mariko Carey, Ms Sze Yoong (PhD candidate), School of Medicine and Public Health, University of Newcastle

b) Professor Nicholas Zwar and Dr Meredith Makham, School of Public Health and Community Medicine, University of New South Wales

c) Professor Grant Russell and Prof Danielle Mazza, School of Primary Health Care, Monash University.

8.1.5. PROJECT MATERIALS

a) Research Assistant Recruitment Log Sheet

The Research Assistant Recruitment Log Sheet (Appendix 8.7.1) is used to record participant eligibility and consent information. More instructions on how to complete this form are covered in Section 6.

b) Name and Date of Birth Slip

The Name and Date of Birth Slip (Appendix 8.6.2) will be used to record participant name and date of birth to allow for linkage to the GP perception of health behaviour questionnaire.
All participants who consent to participate will be asked to fill in their name and date of birth prior to commencing the touch screen survey.

c) **Patient Information Statement**

d) The **Patient Information Statement** provides patients with information regarding the project and how the data collected will be used. A copy of this statement should be given to patients before they begin the study. There will be two versions of this statement. One statement will be given to participants who will not be told that their weight and height will be measured (**Appendix 8.3.1**) and the other will be given to participants who will be told that their weight and height will be measured (**Appendix 8.3.2**).

e) **Patient Consent Form**

After patients have completed the touch screen survey, participants will be asked for their consent to being contacted for follow-up studies. Those who consent to being contacted will need to complete the **Patient Consent Form** (**Appendix 8.4.1**). This form will ask participants to provide their name, postal address, contact number and email address.

f) **Patient Touch Screen Computer Questionnaire**

This survey (**Appendix 8.6.3**) will be loaded onto the touch screen computer. The individual components of the survey will be described in detail in Section 7.

g) **General Practitioner Paper and Pencil Checklist and Cover Sheet (n=35 for each GP)**

Attach the **Name and Date of Birth Slip** (**Appendix 8.6.2**) (see b) to the **General Practitioner Paper and Pencil Checklist and Cover Sheet** (**Appendix 8.6.1**). This survey will be handed to the GP with the patient’s medical records. The GPs will only need to complete this survey for 35 randomly selected patients. After the GP has finished completing the survey, collect the forms and send them to the research team in Newcastle.
8.1.6. THE RECRUITMENT PROCESS

1. A list of participant IDs will be given to you prior to recruitment.

2. Ensure that the laptop is turned on and you are logged into the system before approaching patients.

3. From those presenting for an appointment, identify eligible participants (record details regarding eligibility in the Research Assistant Recruitment Log Sheet (Appendix 8.7.1).

   **Patients are eligible to participate if they are:**
   
   1. Aged 18 years and above
   2. Able to speak and read English sufficiently.

   **Reasons for being ineligible include:**
   
   1. Aged below 18 years (Identified by checking medical records or asking participant)
   2. Visually impaired (If the participant is struggling to read printed materials or expresses problems with vision)
   3. Unable to provide consent (If the participant is mentally impaired or unable to personally provide consent for themselves)
   4. Unable to read/speak English sufficiently (If the person requires assistance to communicate with reception staff, or when asked about the study indicates that they have difficulty reading or understanding English).

4. Note reason for being ineligible in Research Assistant Recruitment Log Sheet.

5. If you did not get the opportunity to invite an eligible participant, please record this on the recruitment log sheet as “did not invite”.

6. Explain study procedures to all eligible patients.
Example script:

Hi, I am <Your name> from the medical school, <relevant university>. We are conducting a research project examining the use of a touch screen computer to collect health information. Would you be able help us by completing a short survey asking about your health? You being involved would provide us with important information to improve GPs’ provision of care. Participation in this study will take about 10 minutes.

Would you be interested in participating in this project?

7. Provide participants with hard-copy Information Statement (Appendix 8.3.1 or 8.3.2).
8. Note consent to participate in this study in Research Assistant Recruitment Log Sheet.
9. If participant chooses not to participate in the study, record reason for non-consent in Research Assistant Recruitment Log Sheet.

If the touch screen is being used by another participant, please record it on the log sheet as “touch screen occupied”.

If patient expresses that they are not interested in filling in the survey or participating in the research project, please record as “patient not interested”.

If patient is busy (with children or other matters), please record as “busy”.

If patient refuses because they feel uncomfortable or unwell, please records as “too ill”.

Note down non-consenters’ gender and estimated age range on recruitment log sheet.

10. For participants who agree to participate, ask them to fill in their name and date of birth on the Name and Date of Birth Slip.

11. Once participants are ready to begin the survey, ensure they are in a part of a room where they have privacy while completing the survey.

12. Locate Digivey Launcher icon on Desktop and double click on icon. Select “Project” from the screen that appears. A list of projects will appear on the screen. Click on “GP project”, and the health survey will be loaded on the laptop (See section 9 for more information).

13. Collect touch screen computer from participant upon survey completion.
14. For participants who time out or have to exit survey prior to completion, note “Yes” to “Time out” on Research Assistant Recruitment Log Sheet (See Section 9 for more details). To exit from the survey, double click the centre of the bottom bar. On the Research Assistant Recruitment Log Sheet, please also note if participants require help with using the touch screen computer.

15. After participants have completed the touch screen survey, ask if they are willing to be contacted for future research. If the participant agrees, provide them with a Patient Consent Form (Appendix 8.4.1). They will be required to provide their name, telephone number, postal address and email address. Participant ID will be printed onto the consent form. Consent forms need to be collected and kept in a safe area.

16. Use alcohol wipes provided to wipe the computer screen before allowing the next participant to commence the survey. This is important to minimise the risk of spread of infection.

Additionally, for the subsample for which GPs are required to complete the perception of health behaviour survey (n=35 for each GP):

17. Attach (staple) patient Name and Date of Birth Slip (Appendix 8.6.2) to General Practitioner Paper and Pencil Checklist and Cover Sheet (Appendix 8.6.1).

18. Place General Practitioner Paper and Pencil Checklist and Cover Sheet with patient medical records. Ask the practice receptionist about how best to do this. Depending on GP/practice preference, collect forms at the end of the day or after each patient.

Please send a copy of the Research Assistant Recruitment Log Sheet by fax [(02) 49138779], mail or email to the research team in Newcastle.
8.1.7. PATIENT TOUCH SCREEN COMPUTER QUESTIONNAIRE

Your role in administering the survey is to load the questionnaire (Appendix 8.6.3) onto the touch screen computer. You should also ensure that participants understand the patient information sheet and provide instructions on how to use the touch screen. Additionally, you will assist the participants in completing the survey questions by answering any questions they may have (see section 8). See Appendix 8.6.4 for examples from the Patient Touch Screen Computer Questionnaire.

Aims of the Patient Touch Screen Computer Questionnaire

The aim of the survey is to collect information regarding health behaviours that may put certain individuals at risk for CVD and cancer. It will ask questions regarding lifestyle behaviours such as levels of physical activity, weight and height, smoking status and alcohol drinking behaviour, as these factors are associated with increased risk of CVD and cancer. This questionnaire will also address family medical history, as participants with family history of cancer or CVD are at a higher risk of developing these diseases. Depression in the general population is also often undetected. It is, therefore, important to assess and detect depression in primary care to allow for appropriate management of this condition.

There will be three versions of the survey which will be administered randomly (based on days of recruitment) to participants.

The next section will detail the modules in the health behaviour questionnaire.
Patient Touch Screen Computer Questionnaire

This questionnaire (Appendix 8.6.3) collects relevant information to assess participants’ health risk. Participants will not receive all the module. Modules related to weight change, additional prostate screening antigen (PSA) tests and mammograms, and additional depression questions will only be administered to a subset of participants.

Relevant modules include:

a) Module 1: Background information

This module will ask participants for their age, gender, ethnic background (Aboriginal and Torres Strait Islander, Maori and other Pacific Islander, South Asian (e.g. Indians, Sri Lankans, Iranians) and whom the participants are expecting to see today at the clinic.

b) Module 2: Personal health history

Participants are asked if they have a personal history of diseases such as high blood pressure, cholesterol and heart disease. They are also asked if they have a family history of cardiovascular disease (CVD) and whether any of their close relatives have ever been diagnosed with heart disease at less than 60 years. These questions allow the classification of participants’ risk for cardiovascular disease.

c) Module 3: Screening for health risk factors

This module asks about screening tests that participants may have had for CVD risk factors and cancer. It also screens participants for depression using a validated depression tool, a version of the Patient Health Questionnaire (PHQ–9).

i) Module 3a: Cardiovascular risk factors screening

This section asks if participants have been screened for high blood pressure, high cholesterol and diabetes (with risk classified according to sex, age and personal history of medical conditions as specified by primary care preventive guidelines).
ii) Module 3b: Cancer screening

Participants are asked if they have ever had cancer or a family history of cancer. This section asks for the last time participant had a faecal occult blood test (FOBT), mammogram, Pap smear test and PSA blood test to screen for different types of cancers (Questions will be tailored to individual participants’ gender and age).

iii) Module 3c: Depression screening

This section screens participants for depression using a validated screening tool, the PHQ–9.

d) Module 4: Lifestyle risk factors

This module asks about alcohol consumption, physical activity levels, weight and height. These questions help us assess whether participants have any risky lifestyle behaviours.

e) Module 5: Additional questions

i) Module 5a: Additional mammography and PSA questions (in version 1 of survey)

Female participants who are aged 40-49 years and indicate that they previously have had mammograms complete additional questions about why they chose to have the test undertaken. They will also be asked if they had any follow-up tests after the mammograms.

Male participants aged 40 or older with no personal history of prostate cancer are asked additional questions about PSA testing if they indicate that they have previously had a PSA test in the last 5 years.

ii) Module 5b: Additional depression questions (in version 2 of survey)

Participants are asked to rate their own levels of depression and indicate if they would be willing to receive professional help for depression.

iii) Module 5c: Additional weight questions (in version 3 of survey)
Participants are asked about whether they have tried to change their weight in the past 12 months and whether they intend to change their weight in the next 12 months. They are also asked about what methods they have previously used and would be willing to use to achieve their targeted weight change.

**e) Module 6: Quality of care and other demographic information**

Participants are asked for additional demographic information such as level of education, postcode and types of concession cards they have. Participants are also asked how many times they have seen their current GPs and the reasons for choosing this practice, and to rank items that could be improved in the clinic.

**f) Module 7: Patient acceptability survey (in version 2 of survey)**

This module asks patients about the acceptability of integrating this assessment into routine practice, and the ease of use of the touch screen.

8.1.8. **USING THE TOUCH SCREEN COMPUTER**

We will provide you with two touch screen computers and three spare batteries for recruitment.

**Using the computer**

Switch on the laptop and log onto the user, “HBRG”. Insert the password that is provided to you by the program coordinator. Do not disclose this password to non-project-related personnel or practice staff. The battery of the touch screen computer has to be charged for 5 hours prior to use. The battery life of the laptop is approximately 4 hours. The laptop will indicate when the battery is low. The battery icon is located in the notification area on the Windows taskbar. Please insert a spare battery into the battery slot when power is low.
Launching the Health Behaviour Questionnaire

When logged into the computer, double click on the green icon called Digivey Launcher V3, located on the desktop. A Digivey screen will be loaded. Select the “Projects” button on the screen.

Image 1: Loading Digivey onto the touch screen computer

A list of projects will appear. From the list of projects, select the relevant “GP project” and press the “Select” button.

Image 2: List of projects on Digivey Launcher
Moving through the Health Behaviour Questionnaire

The survey will appear as a full screen. The question and answer options will be on screen. To select a response, participants need to touch the relevant answer button and then touch “NEXT”.

<table>
<thead>
<tr>
<th>What is your age?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please touch your response and then touch ’NEXT’</td>
</tr>
<tr>
<td>18-24 years</td>
</tr>
<tr>
<td>35-39 years</td>
</tr>
<tr>
<td>50-54 years</td>
</tr>
<tr>
<td>65-69 years</td>
</tr>
</tbody>
</table>

**Image 3:** Image of the health behaviour questionnaire on the touch screen computer

For matrix type questions, participants will need to select an answer from each row, and then press “NEXT”.
Over the last 2 weeks, how often have you been bothered by any of the following problems?

*Please touch the number that best applies to you and then press "NEXT"*

- Trouble falling or staying asleep too much
  - Not at all: 1
  - Several days: 2
  - More than half the days: 3
  - Nearly every day: 4

- Feeling tired or having little energy
  - Not at all: 1
  - Several days: 2
  - More than half the days: 3
  - Nearly every day: 4

- Poor appetite or overeating
  - Not at all: 1
  - Several days: 2
  - More than half the days: 3
  - Nearly every day: 4

- Feeling bad about yourself or that you are a failure or have let yourself or your family down
  - Not at all: 1
  - Several days: 2
  - More than half the days: 3
  - Nearly every day: 4

- Little interest or pleasure in doing things
  - Not at all: 1
  - Several days: 2
  - More than half the days: 3
  - Nearly every day: 4

**Image 4:** Image of the matrix type questionnaire on the touch screen computer

For questions that require the participants to enter or type in information, the number pad or keyboard on the screen can be used to insert answers. To go back, participants can touch the “BACK” button located at the bottom left corner of the screen.

**Image 5:** Example of number pad question on the touch screen computer
If the participant wishes to exit the survey prior to completion, double click on the centre of the bottom of the screen between the “BACK” and “NEXT” buttons. After the participant has completed the survey, an “End screen” will flash for 7 seconds. The “Start screen” will appear and the survey will be ready to be completed by the next participant.

Image 6: Start screen of the health behaviour survey

Remember to wipe down the touch screen computer with alcohol wipes before handing the touch screen computer to the next participant.

To exit from the survey screen, right click the mouse. A cursor will appear. Right click on the TOP RIGHT side of the screen to exit. This will only work when the survey is at the “Start screen” (See image 6). Alternatively, press the CTRL, ALT and DEL keys on the keyboard. Select “Start Task Manager” from the list and “End Task for Digivey Launcher”.
What should I do if the computer times out?

The touch screen computer automatically times out after 15 minutes of inactivation. When this occurs, the survey will shut down and the start screen (Image 6) will appear. Participants who experience this time-out will not be able to continue with the survey where they left off. It is important to prompt participants to keep moving through the survey. If the computer does time out, ask participants if they would like to start the survey again. Please enter participant ID and start survey again. If participant declines, thank the participant for their time and note participant as “Time out” on recruitment log sheet.

Downloading data

To download data onto an external USB drive, insert USB flash drive into the laptop. Create a folder entitled “Digivey projects”. Double click the Digivey Launcher V3 icon located on the desktop. Select “Data transfer”. Click on the “Select target drive” button and browse to locate your USB flash drive folder. After you have located the folder, press “Save”. Please ensure the “No action. Keep records” option is selected. After you have done this, press the “Transfer Results” button. All new records will be saved into your flash drive.

For practices in Melbourne and Sydney: Select projects and then the “GP project” from the list of projects that pop up. Select “Export” from the side bar and check “Export as Zip File”. Press “Browse” and select your target drive. Then select “User select password” and insert password. Results will then be sent to researchers based in Newcastle.
8.1.9. FREQUENTLY ASKED QUESTIONS (FAQS)

This section addresses potential questions that participants may have regarding this research project, and suggested answers to the questions.

Why should I participate in this research project?

This research project will examine whether a touch screen computer survey helps provide doctors with additional health information so that they can provide patients with the best possible care.

Your thoughts on the usefulness of this tool will be a positive step towards helping others receive better quality care and reduce their health risk status.

How will the researchers use the information collected?

The information collected will be published in scientific journals. Any information that may identify you personally, such as your name and location or those of anyone else you mention, will be removed or changed. If you have further concerns regarding the use of the information you provide, please ask the receptionist for the contact details of the researcher.

How do I use the touch screen computer?

I will start up the survey on the touch screen computer. You need to read each question and select the appropriate answer by touching it with your finger. The next question will then appear on the screen. If you are called in for your appointment while completing the survey, please return the computer to me and I will exit the survey for you.

What should I do if I’m called in to see the GP but I have not completed the questions?

If you are called in for your appointment, you will be able to quit at any time while completing the survey. Just return the touch screen computer to me and I will exit the survey for you.
Why do the researchers want information regarding my family’s medical history?

Your family history may increase your risk for certain types of disease. This information is helpful in determining what sort of screening tests may be relevant for you.

Will my information be kept private?

If you choose to complete the surveys, your privacy will be protected. Only your doctor will have access to your private medical records. Individual participants will not be identified in any of the reports arising from the information. Data will only be presented in summarised form. Your data would be stored securely using an identification number, not your name, and only the research team would have access.

Can I change my mind about participating in this project?

You can choose to withdraw from the project at any time by advising your GP. The researchers will not use the information you have provided should you choose to withdraw.

In situations where participants ask for medical advice regarding health conditions, please refer participants to their GPs.

DO NOT ATTEMPT TO PROVIDE ANY MEDICAL ADVICE TO PARTICIPANTS.

8.1.10. COMMUNICATION ISSUES

(a) Communication with the participants

What should I do if a participant becomes upset or distressed?

If a participant becomes upset, ask them if they would like to stop the survey. Reassure them that it is okay to change their mind about participation. Encourage the participant to talk to their
doctor about what has upset them. Ensure that the participant has a copy of the information sheet and knows who they can contact if they have concerns about the research.

**What should I do when I am unable to answer a patient’s question?**

Call Dr Mariko Carey or Ms Serene Yoong and ask if they can assist with the patient enquiry. If the request is not urgent, leave a message and ask for one of the researchers to call you back.

**(b) Communication with the research team**

**What do I need to send to the research team in Newcastle?**

a) All electronic data collected (daily)

b) Research Assistant Recruitment Log Sheets (daily)

c) General Practitioner Paper and Pencil Checklist and Cover Sheet (weekly)

d) All Patient Consent Forms (weekly)

During the initial stage of recruitment, the research team will be in touch with you daily via telephone. At the later stages, contact will be made weekly (either by telephone or email) to ensure that the recruitment process is running well. At that stage, all electronic data and copies of the recruitment log sheet will still need to be sent back daily.

The RACGP clinical audit number and GP’s last name will be sent to the research team on the day that the information is obtained from participating GPs.

For off-site recruitments, please send back forms using registered post.

**How do I download data from the computer?**

For practices in Newcastle: The research team will provide you with a USB flash drive. To download data, insert the USB flash drive into the laptop. Create a folder entitled “Digivey projects”. Double click on the Digivey Launcher V3 icon located on the desktop. Select “Data
“Transfer” and select your USB flash drive folder as target drive. Press “Transfer results” and select “GP project”. All new records will be saved onto your flash drive.

**For practices in Melbourne and Sydney:** Select projects and then the “GP project” from the list of projects that pop up. Select “Export” from the side bar and check “Export as Zip File”. Press “Browse” and select your target drive. Then select “User select password” and insert password. The research team will provide you with passwords which you can use.

**Who can I send data to?**

Data can be sent to Dr Mariko Carey at Mariko.Carey@newcastle.edu.au or Ms Serene Yoong at Sze.Yoong@newcastle.edu.au.

**Important:** Please remember to follow the above instructions as this will enable encryption of data and protection of patient privacy.

**Who can I talk to if I encounter any problems with recruitment, patients or GPs?**

Contact the chief investigator on your site and try to solve the problem on site. Ensure that you inform Dr Mariko Carey of the problem and the steps you have taken to solve the problem. If the problem cannot be resolved, call Dr Mariko Carey, Ms Serene Yoong or Dr Flora Tzelepis.

**8.1.11. MAINTAINING THE TOUCH SCREEN COMPUTER**

**Charging batteries**

If you are responsible for bringing the touch screen computers to the clinic, please ensure the batteries (including spare batteries) are fully charged. This will ensure you can make the most out of your time in the practice.
Error messages

Image 7: Example of error message

We have had some issues with error messages appearing while patients are completing the survey. If an error message appears you will need to take note of which screen the message occurred on. Touch “OK”, and then restart the survey using the participant’s unique ID code. Explain to the participant that their answers up to that point are saved, but you will need to take them manually to the same point in the survey by entering dummy data. Once the survey is completed, you will need to create a folder on the external hard drive with the participant ID number, and save the “DIGIVEY SAFETY COPY” accessible from C:/DigiveySafetyCopy.

What should I do if there is a breakdown/malfunction of the touch screen computer tool?

Please refer to the DELL computer manual for the DELL Latitude XT2 provided to you. If the problem persists, please contact the research team at the University of Newcastle.
If you have any general or project-related questions, please contact:

**Dr Mariko Carey**  
Contact no: 02 49138320  
[Mariko.Carey@newcastle.edu.au](mailto:Mariko.Carey@newcastle.edu.au)

**Dr Flora Tzelepis**  
Contact no: 02 49138262  
[Flora.Tzelepis@newcastle.edu.au](mailto:Flora.Tzelepis@newcastle.edu.au)

**Ms Serene Yoong**  
Contact no: 02 49138945  
[Sze.Yoong@newcastle.edu.au](mailto:Sze.Yoong@newcastle.edu.au)
8.1.12. REFERENCES


APPENDIX 8.2: INVITATIONS TO PARTICIPATE
Appendix 8.2.1: General Practitioner Invitation Letter

Dear <Insert GP’s name>,

I am writing to invite you and the other members of your practice to participate in a general practice research study we are conducting at Monash University, in partnership with the University of New South Wales and University of Newcastle. An information sheet with more details about the study is also enclosed.

Our study aims to:

- test whether an electronic patient health assessment is a feasible and acceptable way of collecting patient health data for GPs
- identify whether the data collected are useful to GPs in providing care to patients.

Overview of the study

- to be eligible, at least 2 GPs who work 8 or more sessions per week would need to agree to participate
- a touch screen computer device containing a patient survey will be set up in your practice reception area for a period of 2 to 3 weeks
- the touch screen survey can be completed in less than 10 minutes
• a research assistant will be present at your practice to invite patients to participate while waiting for their consultations; the assistant will also support them in using the computer device

• all patients aged 18 or older, who have sufficient English to provide informed consent, and are physically and mentally able to complete the touch screen survey will be invited to do so

• participating GPs within the practice would be asked to complete a brief checklist for 35 of their patients participating in the study; the checklist asks GPs to indicate which health risks they perceive the patient has

What are the rewards of participating?
The results of this study will help to determine whether the health information collected via touch screen from patients in the waiting room can be a useful aid for GPs.

If you agree to be involved in this project, we will provide financial reimbursement to the practice that is aimed to compensate you for your time spent completing the checklist for 35 patients. Reimbursement will vary depending on the number of GPs who participate; ranging from $800 for 2 GPs to $2400 for 6 or more GPs.

The GPs who participate in the study will have the opportunity to complete a Clinical Audit (RACGP QI & CPD Category 1 activity (40 category 1 points)). This CPD activity is approved for mental health points in the QI & CPD program.

What are the costs and time involved for you and your practice?
We anticipate the time involved for each GP will be around 1½ **hours in total** (around 2 minutes for each of the 35 patient checklists you complete), and the research assistant will prompt you to do this with a group of consecutive patients towards the end of the data collection period. You can also choose to participate in the Clinical Audit (RACGP QI & CPD Category 1 activity – 40 Category 1 points). Additional time will include reflection on the feedback data and completing written material.

Participation in the QA & CPD activity involves:

- completion of a brief checklist for 35 patients (audit 1)
- obtaining feedback on prevalence of depression amongst participating patients
- completing the brief checklist for an additional 35 participants (audit 2).

**What if I do not want to participate in QI & CPD Audit Activity but would like to participate in the study?**

If you would not like to participate in the audit activity, but would like to participate in the study, you will be asked to complete the brief checklist for **only 35 patients**.

I believe that this project will lay the foundation for some important work in developing electronic systems to help support general practice. I hope that you will consider this invitation. I will follow up with you in approximately two weeks’ time to see if you have any questions about the project and whether you would like to discuss this with me in person. In the meantime, if you would like any additional information on the project, please do not hesitate to contact me <Insert email address and contact number>.

*Yours sincerely,*
Appendix 8.2.2: Waiting Room Poster

Testing the acceptability and feasibility of a system-oriented intervention involving touch screen computers for reducing health risk factors amongst general practice patients

You are invited to participate in the above research project being conducted by researchers from the University of Newcastle, University of New South Wales and Monash University.

Why is the research being done?

Early detection may improve outcomes for diseases such as cancer, heart disease and depression. However, not everyone has the screening tests that could help to reduce risks of these diseases. This study will test whether an electronic health assessment will provide doctors with additional information that they can use to offer their patients best possible care.

Who can participate in the research?

We are seeking general practice patients to participate in this study. If you can read English and are aged 18 years or over, you are eligible to participate.

What would you be asked to do?

A member of the research team may ask you to participate. If you do participate you will be invited to complete a health assessment on a touch screen computer before you see your doctor.
The touch screen assessment will ask about your background and your health. Additional questions regarding your lifestyle, emotions and health tests that you have had are also included.

The information we collect will be reported in scientific journals and conference papers. Individual participants will not be identified in any of the reports or papers.

Participation in this research is entirely your choice. Whether or not you decide to participate will not affect your medical care in any way.

Please ask the research staff present in the practice for more information.
APPENDIX 8.3: INFORMATION STATEMENTS
Appendix 8.3.1: Patient Information Statement (uninformed group)

Information Statement for the Research Project:
Testing the acceptability and feasibility of a system-oriented intervention involving touch screen computers for reducing health risk factors amongst general practice patients

You are invited to participate in the joint research project identified above which is being conducted by Professor Rob Sanson-Fisher, Dr Christine Paul, Professor Catherine D’Este, Dr Mariko Carey, Dr Kerry Inder and Ms Sze Lin (Serene) Yoong from the University of Newcastle, Professor Nicholas Zwar and Dr Meredith Makeham from the University of New South Wales and Professor Grant Russell and Associate Professor Danielle Mazza from Monash University.

The research is part of Sze Lin Yoong’s studies at the University of Newcastle, supervised by Professor Rob Sanson-Fisher, D Mariko Carey and Professor Catherine D’Este from the School of Medicine and Public Health.

Why is the research being done?
Early detection and treatment may improve outcomes for diseases such as cancer, heart disease and depression. People who suffer from depression are also at increased risk of cardiovascular disease, making it even more important to seek help for depression. However, not everyone is aware of detection tests that they could have. This study aims to examine whether an electronic health
assessment provides additional information that would be helpful to doctors in providing care to their patients. It will also examine how acceptable this approach is to both patients and doctors. The role of this general practice within this study is to provide a central location for the recruitment of patients. This study is part of academic research conducted by the above institutions. Practices participate voluntarily in this research.

**Who can participate in the research?**

We are seeking general practice patients to participate in this study. If you can read English and you are aged 18 years or over, you are eligible to participate.

**What choice do you have?**

Participation in this research is entirely optional. Only those people who consent to participate will be included in the project. Whether or not you decide to participate, you will still receive the medical care you came for. If you do decide to participate and later change your mind, you may withdraw from the project by advising your GP.

**What would you be asked to do?**

If you do participate you will be invited to complete a health assessment on a touch screen computer before you see your doctor. You will be asked to provide your name and date of birth prior to commencing the survey. Some of the questions are about general information such as your age and gender. Other questions will ask about you and your family’s medical history, screening tests you may have had, your lifestyle, previous attempts to change your weight and your emotions in the last 2 weeks. Additionally, some questions will ask about women’s health, such as vaccination for cervical cancer, and pre-conception care. For a sub-group of participants, we will also ask GPs to complete a checklist identifying which risk factors he/she perceives the patient has.
This will enable us to tell if the electronic health assessment provides additional information to GPs about their patients’ health.

We would also like to ask if you would be willing to be contacted in the future about participating in other research studies. If you are willing to be contacted, you will be asked to complete a consent form and provide your name and contact details. At this stage, you are not being asked for consent to participate in these studies. You are only being asked to give permission for the researchers to contact you again.

**How much time will it take?**

The survey should take about 10 minutes to complete. If you are unable to complete the survey for any reason, including being too ill or being called for your appointment, return the touch screen computer to the research staff.

**What are the risks and benefits of participating?**

We cannot promise you any benefit from participating in this research. Your thoughts on the usefulness of this tool will be a positive step towards helping others receive better quality care, reduce their health risk status and improve their chances of early detection and treatment.

The questions included in this survey are of a sensitive nature and may cause you distress. If they do cause you any concern, please mention it to your doctor when you go in for your appointment. If you do not feel comfortable doing this or feel you require additional support, you can contact the Beyond Blue helpline on 1300 224 636. You can also contact a member of the research team, Dr Mariko Carey on (02) 49138320 or Ms Serene Yoong on (02) 49138945, and they will be able to direct you to further organisations who may be able to assist you.
**How will your privacy be protected?**

If you choose to complete the survey, your privacy will be protected. Only your doctor will have access to your private medical records. Any identifying information that you provide, such as your name, will be replaced by a unique ID code. The file linking your name to your ID code will be stored separately from your survey data. The ID code will be used to link your survey responses to your GP’s assessment of your health risk factors. Your GP will know whether you have agreed to participate in the project, but will not have access to your survey responses.

If you have indicated that you are willing to be contacted to participate in future research, your survey results from today will be separated from your contact details. These will be linked only by an identification code. Further ethical approval will be obtained for any future studies.

**How will the information collected be used?**

The information will be used to decide whether the computer-based system is a feasible and acceptable way to help GPs provide best quality care. The results will also be reported in scientific journals and conference papers. Individual participants will not be identified in any of the reports arising from the information. Data will only be presented in summarised form. Your data would be stored securely using an identification number, not your name, and only the research team would have access. These data will be kept for a minimum of seven years at the University of Newcastle. You will have the opportunity to withdraw your data by contacting the research staff at the university (02 49138945) and providing the patient ID number located at the top of this information statement.
What do you need to do to participate?

If you would like to participate, please inform the research staff.

Your responses to the survey are NOT PROVIDED to your GP.

If you have any concerns about mental health issues, please talk to your GP about this. For additional information, contact the Beyond Blue helpline at 1300 22 4636.

Thank you for considering this invitation.

Sze Lin Yoong
PhD Candidate
The University of Newcastle

Rob Sanson-Fisher
Professor of Health Behaviour
The University of Newcastle

Complaints about this research

This project has been approved by the University’s Human Research Ethics Committee, Approval No. H-2009-0341

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au
Appendix 8.3.2: Patient Information Statement (informed group)

Information Statement for the Research Project:

Testing the acceptability and feasibility of a system-oriented intervention involving touch screen computers for reducing health risk factors amongst general practice patients

You are invited to participate in the joint research project identified above which is being conducted by Professor Rob Sanson-Fisher, Dr Christine Paul, Professor Catherine D’Este, Dr Mariko Carey, Dr Kerry Inder and Ms Sze Lin (Serene) Yoong from the University of Newcastle, Professor Nicholas Zwar and Dr Meredith Makeham from the University of New South Wales and Professor Grant Russell and Associate Professor Danielle Mazza from Monash University.

The research is part of Sze Lin Yoong’s studies at the University of Newcastle, supervised by Professor Rob Sanson-Fisher, Dr Mariko Carey and Professor Catherine D’Este from the School of Medicine and Public Health.

Why is the research being done?

Early detection and treatment may improve outcomes for diseases such as cancer, heart diseases and depression. People who suffer from depression are also at increased risk of cardiovascular disease, making it even more important to seek help for depression. However, not everyone is aware of detection tests that they could have. This study aims to examine whether an electronic health assessment provides additional information that will be helpful to doctors in providing care to their
patients. It will also examine how acceptable this approach is to both patients and doctors. The role of this general practice within this study is to provide a central location for the recruitment of patients. This study is part of academic research conducted by the above institutions. Practices participate voluntarily in this research.

**Who can participate in the research?**

We are seeking general practice patients to participate in this study. If you can read English and you are aged 18 years or over, you are eligible to participate.

**What choice do you have?**

Participation in this research is entirely optional. Only those people who consent to participate will be included in the project. Whether or not you decide to participate, you will still receive the medical care you came for.

If you do decide to participate, and later change your mind, you may withdraw from the project.

**What would you be asked to do?**

If you do participate, you will be invited to complete a health assessment on a touch screen computer before you see your doctor. You will be asked to provide your name and date of birth prior to commencing the survey. Some of the questions are about general information such as your age and gender. Other questions will ask about you and your family’s medical history, screening tests you may have had, your lifestyle, previous attempts to change your weight, and your emotions during the last 2 weeks. In addition, you will also be asked about any lower back pain you may be experiencing and about women’s health concerns, such as vaccination for cervical cancer, and pre-conception care. We would also like to ask if you would be willing for a researcher to measure your height and weight in a
private consulting room after you complete the survey. For a sub-group of participants, we will also ask GPs to complete a checklist identifying which risk factors he/she perceives the patient has. This will enable us to tell if the electronic health assessment provides additional information to GPs about their patients’ health.

We would also like to ask if you would be willing to be contacted in the future about participating in other research studies. If you are willing to be contacted, you will be asked to complete a consent form and provide your name and contact details. At this stage, you are not being asked for consent to participate in these studies. You are only being asked to give permission for the researchers to contact you again.

**How much time will it take?**

The survey should take about 10 minutes to complete. If you are unable to complete the survey for any reason, including being too ill or being called for your appointment, return the touch screen computer to the research staff.

**What are the risks and benefits of participating?**

We cannot promise you any benefit from participating in this research. Your thoughts on the usefulness of this tool will be a positive step towards helping others receive better quality care, reduce their health risk status and improve their chances of early detection and treatment.

The questions included in this survey are of a sensitive nature and may cause you distress. If they do cause you any concern, please mention it to your doctor when you go into your appointment. If you do not feel comfortable doing this or feel you require additional support, you can contact the Beyond Blue helpline on 1300 224 636. You can also contact a member of the research team, Dr Mariko Carey on (02) 49138320 or Ms Serene Yoong on (02) 49138945, and they will be able to direct you to further organisations who may be able to assist you.
How will your privacy be protected?

If you choose to complete the survey, your privacy will be protected. Only your doctor will have access to your private medical records. Any identifying information that you provide, such as your name, will be replaced by a unique ID code. The file linking your name to your ID code will be stored separately from your survey data. The ID code will be used to link your survey responses to your GP’s assessment of your health risk factors. Your GP will know whether you have agreed to participate in the project, but will not have access to your survey responses.

If you have indicated that you are willing to be contacted to participate in future research, your survey results from today will be separated from your contact details. These will be linked only by an identification code. Further ethical approval will be obtained for any future studies.

How will the information collected be used?

The information will be used to decide whether the computer-based system is a feasible and acceptable way to help GPs provide best quality care. The results will also be reported in scientific journals and conference papers.

Individual participants will not be identified in any of the reports arising from the information. Data will only be presented in summarised form. Your data would be stored securely using an identification number, not your name, and only the research team would have access. These data will be kept for a minimum of seven years at the University of Newcastle. You will have the opportunity to withdraw your data by contacting the research staff at the university (02 49138945) and providing the patient ID number located at the top of this information statement.
What do you need to do to participate?

If you would like to participate, please inform the research staff.

Your responses to the survey are NOT PROVIDED to your GP.

If you have any concerns about mental health issues, please talk to your GP about this. For additional information, contact the Beyond Blue helpline at 1300 22 4636.

Thank you for considering this invitation.

Rob Sanson-Fisher
Professor of Health Behaviour
The University of Newcastle

Sze Lin Yoong
PhD Candidate
The University of Newcastle

Complaints about this research

This project has been approved by the University’s Human Research Ethics Committee, Approval No. H-2009-0341

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au.
Appendix 8.3.3: General Practitioner Information Statement

Information Statement for the Research Project:

Testing the acceptability and feasibility of a system-oriented intervention involving touch screen computers for reducing health risk factors amongst general practice patients

You are invited to participate in the joint research project identified above which is being conducted by Professor Rob Sanson-Fisher, Dr Christine Paul, Professor Catherine D’Este, Dr Mariko Carey, Dr Kerry Inder and Ms Sze Lin (Serene) Yoong (PhD candidate) from the University of Newcastle, Professor Nicholas Zwar and Doctor Meredith Makeham from the University of New South Wales and Professor Grant Russell from Monash University.

The research is part of Sze Lin Yoong’s studies at the University of Newcastle, supervised by Professor Rob Sanson-Fisher, Dr Mariko Carey and Professor Catherine D’Este from the School of Medicine and Public Health.

Why is the research being done?

Cancer, cardiovascular disease and depression continue to be leading causes of morbidity globally. As you may be aware, early detection and treatment can help improve outcomes for several types of cancer. Similarly, risk factor detection and management play an important role in the prevention of cardiovascular disease. Timely identification and provision of appropriate treatment for depression
are also needed. Previous research has shown that depression is a significant problem which often goes undetected and untreated. There are an overwhelming number of risk factors implicated in reducing risks for these diseases. Despite the increase in public health campaigns, participation in many types of preventive care activities remains sub-optimal.

Electronic data collection has been shown to be a reliable form of patient data collection and may provide a means of collecting data that can help GPs identify patient risk factors in a time-efficient way. If collection of patient data in this way is found acceptable to both patients and GPs, there is potential for it to be used to provide GPs with individually tailored recommendations for each patient about risk factors and screening needs identified. If successful, the benefits of having such a tool to assist GPs would be tremendous in easing the time demands faced each day and enabling the provision of better quality care during each patient consultation.

This study aims to assess how practical and useful an electronic patient data collection tool is in surgery waiting rooms. We will be assessing both patient and GP attitudes towards collecting vital patient health data electronically prior to consultations and whether this is a positive step towards assisting GPs to provide the best possible care for minimising their patients’ health risk status.

The project will also assess whether electronic data collection has the potential to provide any new information to GPs. To assess this we will ask GPs from participating practices to complete a two-minute checklist for a subsample of 35 participating patients following their consultation. The checklist will ask GPs to identify which health risk factors you think the patient may have and which screening tests the patient may be overdue for. If you choose, this can also contribute to a Group 1 Quality Improvement and Continuous Professional Development (QI & CPD) associated audit activity. This CPD activity is approved for mental health points in the QI & CPD program. If you wish to participate in the audit activity, you will receive feedback on your rate of
detection for depression, based on the checklists you have completed. You will need to complete some brief written materials, and complete a follow-up audit for an additional 35 patients 3 months later.

The attached Patient Information Sheet will provide you with a description of what is involved for your patients should you choose to participate. Briefly, it would involve consenting patients completing a survey assessing cardiovascular, cancer and depression risk by touch screen computer in the waiting room prior to their consultations. If you decide to participate we will supply your surgery with two hand-held touch screen computers and one printer. The project is expected to run for approximately two to three weeks. A research assistant will be present at your surgery for the entire duration of the project and will be responsible for patient recruitment, assisting patients with enquiries, managing the equipment, and sending the data back to the research team.

At the end of the study period, we would also like to obtain your feedback on the usefulness of the touch screen data collection system and its feasibility for routine implementation. This would involve a five-minute pen and paper survey.

*What choice do you have?*

Participation in this research is entirely your choice. Only GPs who express their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you and will not affect your professional relationship with the research team.

*What are the risks and benefits of participating?*

You will be able to obtain 40 category 1 points if you choose to participate in the **Quality Improvement and Continuous Professional Development (QI & CPD)** audit activity approved by the Royal Australian College of General Practitioners (see above).
Your participation will help in the early phases of the development of an electronic tool for routine collection of data from general practice patients and provision of tailored recommendations. If successful, this tool could have tremendous benefits for GPs and for general practice patients.

It is not expected that you will be exposed to any risks by taking part in this study.

**How will your privacy be protected?**

If you choose to participate, your privacy will be protected. Any data that you supply to us by completing patient checklists or the acceptability survey will be de-identified.

**How will the information collected be used?**

The information will be used to decide whether the computer-based system is a feasible and acceptable way to help GPs provide best quality care. The results will also be reported in scientific journals and conference papers.

Individual GPs and patients who participate will not be identified in any of the reports arising from the information. Data will only be presented in summarised form. Your data would be stored securely using an identification number, not your name, and only the research team would have access. These data would be kept for a minimum of seven years at the University of Newcastle.

**What do you need to do to participate?**

Please read this Information Statement and be sure you understand its contents. If there is anything you do not understand or you have questions, please contact the research team.

If you would like to participate, please sign the consent form and return this to <insert appropriate site specific contact details>.
Further information

If you would like further information please contact <insert contact detail from each site>.

Thank you for considering this invitation.

Sze Lin Yoong
PhD Candidate
The University of Newcastle

Rob Sanson-Fisher
Professor of Health Behaviour
The University of Newcastle

Complaints about this research

This project has been approved by the University’s Human Research Ethics Committee, Approval No. H-2009-0341.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au.
APPENDIX 8.4: CONSENT FORMS
Appendix 8.4.1: Patient Consent Form

Consent Form for the Research Project:
Testing the acceptability and feasibility of a system-oriented intervention involving touch screen computers for reducing health risk factors amongst general practice patients

I agree to participate in the above research project and give my consent voluntarily.

I understand that the project will be conducted as described in the information statement, a copy of which I have retained.

By touching “NEXT” on the first page of the questionnaire, I provide consent to complete the touch screen computer questionnaire.

I consent to having my responses regarding lifestyle and screening compared with my GP’s responses

YES / NO

I have the opportunity to have questions about the study answered to my satisfaction.

I understand that information obtained will remain confidential.

Please retain a copy of the information statement for future reference.

_________________________________________  ____________________________  
Signature                                      Date

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Complaints about this research

This project has been approved by the University’s Human Research Ethics Committee, Approval No. H-2009-0341.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au.
Appendix 8.4.2: General Practitioner Consent Form

Consent Form for the Research Project:
Testing the acceptability and feasibility of a system-oriented intervention involving touch screen computers for reducing health risk factors amongst general practice patients

I agree to participate in the above research project and give my consent voluntarily.

I understand that the project will be conducted as described in the information statement, a copy of which I have retained.

I understand that participation is voluntary and that I can withdraw from the project at any time and do not have to give any reason for withdrawing.

I consent to

- All eligible patients under my care within this practice being invited to participate in this project
- Completing a survey assessing my perception of patients’ health risk factors (GP checklist) for each patient who has agreed to participate in the study
- Completing a brief acceptability survey at the end of the study.

I understand that if I choose to participate in the RACGP Quality Assurance and Continuous Professional Development (QI & CPD) audit activity, I will need to complete additional forms associated with the activity. I will also have to complete the checklist for an additional 35 patients three months after the initial audit.

I understand that information I provide in the acceptability survey will remain confidential.
I have had the opportunity to have questions about the study answered to my satisfaction.

____________________________________  __________________
Signature of general practitioner       Date

____________________________________  __________________
Printed name of general practitioner    Time

Please retain a copy of the information statement and signed consent form for future reference. Return completed form to Serene Yoong by fax at (02) 49138779 or using the reply-paid envelope.

Complaints about this research

This project has been approved by the University’s Human Research Ethics Committee, Approval No. H-2009-0341.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au.
Appendix 8.4.3: Practice Manager Consent Form

Consent Form for the Research Project:

The acceptability and feasibility of a system-oriented intervention involving touch screen computers for reducing health risks amongst general practice patients

I agree for the GP practice named: __________________________________________________________
and the practice staff to participate in the above research project and give my consent voluntarily.

I understand that the project will be conducted as described in the information statement, a copy of which I have retained.

I consent to

- A research staff member identifying all eligible patients under the care of consenting general practitioners within this practice and inviting them to participate in this project
- Touch screen computers being set up for the collection patient data within the waiting room.

I understand that information obtained from consenting general practitioners and patients from this practice will remain confidential to the researchers.

I have had the opportunity to have questions about the study answered to my satisfaction.
Signature of GP Practice Manager or Senior GP __________________________ Date ________________

Printed name of GP Practice Manager or Senior GP __________________________ Time ________________

Please retain a copy of the information statement and signed consent form for future reference. Return completed form to Serene Yoong by fax at (02) 49138779 or using the reply-paid envelope.

Complaints about this research

This project has been approved by the University’s Human Research Ethics Committee, Approval No. H-2009-0341.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au.
APPENDIX 8.5: DEMOGRAPHIC QUESTIONNAIRES
Appendix 8.5.1: General Practitioner Demographic Survey

We would like to obtain some general information regarding you and your practice as a general practitioner. This form will take about two minutes to complete and will allow us to compare the characteristics of practitioners who participate with those of the national data.

☐ Male
☐ Female

Age: _______ years

How many years have you spent in general practice? _______ years

Number of general practice sessions you usually work per week: ____________

(1 session = ~4 hours, e.g. a morning session)

GP QI & CPD no: ____________

Return completed survey to Serene Yoong by fax (02 4913 8779) or using the reply-paid envelope.

Complaints about this research

This project has been approved by the University’s Human Research Ethics Committee, Approval No. H-2009-0341. Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human.Ethics@newcastle.edu.au.
Appendix 8.5.2: Practice characteristics survey

We would like to obtain some general information regarding the practice you currently work at. This form will take about two minutes to complete and will allow us to compare the characteristics of practices participating in this project with that of the national data.

How many GPs work with you at this practice? _______

Postcode of major practice address _______

☑ Yes, all patients
☐ Yes, pension/health-care card only
☐ Yes, selected mixture of patients
☐ No

Do you bulk bill?

☐ No

☐ No

Is there a practice nurse at your major practice?

☐ Yes, full-time
☐ Yes, part-time ______days/week

Return completed survey to Serene Yoong by fax (02 4913 8779) or using the reply-paid envelope.
Complaints about this research

This project has been approved by the University’s Human Research Ethics Committee, Approval No. H-2009-0341.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au.
Appendix 8.6.1: General Practitioner Paper and Pencil Checklist and Cover Sheet

The following definitions have been used for the health perception checklist.

**Health risks**

*Current smoker:* A person is defined as a current smoker if they indicate that they smoke (either daily or occasionally).

*Obesity and overweight:* Overweight: $\text{BMI} = 25–29.9 \text{ kg/m}^2$. Obesity: $\text{BMI} \geq 30 \text{ kg/m}^2$. Body mass index (BMI) is calculated using weight (in kilograms) divided by height (in metres) squared.

*Clinical depression:* Depression is likely in someone who has over the last two weeks felt little interest or pleasure in doing things and felt down, depressed or hopeless. A score $\geq 10$ on the Patient Health Questionnaire–9 (PHQ–9) has been used to define clinical depression.

*Risky alcohol consumption:* A patient is considered at risk if their alcohol consumption levels are more than that recommended by 2009 NHMRC Guidelines for reducing risk of alcohol-related harm over a lifetime ($\geq 2$ standard drinks daily or almost daily) OR if they usually have more than four standard drinks on one occasion (weekly, daily or almost daily). A score of $\geq 3$ on the Alcohol Use Disorders Identification Test Consumption (AUDIT–C) indicates risky drinking.

*Exercise:* Adequate exercise is defined as performing at least 30 minutes of moderate or vigorous intensity physical activity five times per week.

**Screening tests (Recommendations based on the RACGP Guidelines to Preventive Care, Red Book)*

*Blood pressure:* It is recommended that all adults have their pressure checked every two years. People at higher risk may be required to have more frequent blood pressure tests. For example, people aged more than 50 years should be screened every 12 months.
**Blood cholesterol:** It is recommended that people aged 45 years and over have their blood lipid levels checked every five years. People at higher risk may be required to have their blood lipid levels checked more frequently. For example, those who are aged 45 and over and smoke should be tested every two years.

**Fasting blood glucose:** People at high risk of diabetes (e.g. pre-diabetes, history of gestational diabetes) should have their fasting blood glucose tested every three years.

**Skin check:** People with a personal or family history of melanoma should have their skin checked every 12 months.

**Faecal occult blood test (FOBT):** People aged 50 years and older should have an FOBT every 2 years.

**Pap test:** Females aged between 18 and 75 years should have a Pap test every two years.

**Mammogram:** Females aged 50–69 should have a mammogram every two years.

*Screening intervals vary depending on individual participants’ health status.*
1. Does the patient have any of the following health risks? *(Please tick your response)*

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<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Current cigarette smoker</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>b)</td>
<td>Overweight</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>c)</td>
<td>Obesity</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>d)</td>
<td>Clinical depression</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>e)</td>
<td>Risky alcohol consumption</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>f)</td>
<td>Inadequate exercise</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>

2. According to the Royal Australian College of General Practitioner (RACGP) Guidelines, is the patient overdue for any of the following tests? *(Please tick your response)* *(Note: RACGP recommendations may vary according to the patient’s health status)*

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Blood cholesterol</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>b)</td>
<td>Blood pressure check</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>c)</td>
<td>Fasting blood glucose</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>d)</td>
<td>Faecal occult blood test</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>e)</td>
<td>Mammogram</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>f)</td>
<td>Pap test</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>g)</td>
<td>Skin check</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>

3. When did you complete this survey? *(Please tick your response)*

□ Before the consultation    □ Immediately after the consultation
□ During the consultation   □ At the end of the session
Appendix 8.6.2: Name and Date of Birth Slip

Name: ........................................................................................................................................
(First name, surname)

Date of birth: ..............................................................................................................................
(dd/mm/yy)

Name of doctor seeing today: ........................................................................................................

Participant ID (staff use only): ....................................................................................................
Appendix 8.6.3: Patient Touch Screen Computer Questionnaire

Thank you for your interest in participating in this research project. The information you provide will help us determine whether the touch screen computer questionnaire is useful in providing us with information regarding your health.

Touch the “NEXT” button on the bottom right-hand corner of the screen to indicate that you are willing to participate in this study. Please also retain the hard copy version of your information statement for future reference.

Please touch the “NEXT” button when you are ready to commence the survey.
Insert participant ID

Please insert 6-digit ID and then touch “NEXT”.

Module 1: Your background

1. Are you

Please touch your response and then touch “NEXT”.

1 = Male
2 = Female

2. What is your age?

Please touch your response and then touch “NEXT”.

1 = 18–24 years
2 = 25–29 years
3 = 30–34 years
4 = 35–39 years
5 = 40–44 years
6 = 45–49 years
7 = 50–54 years
8 = 55–59 years
9 = 60–64 years
10 = 65–69 years
11 = More than 70 years

3. Your ethnic background is:

Please touch your response and then touch “NEXT”.

1 = Aboriginal or Torres Strait Islander
2 = Maori and other Pacific Islander
3 = South Asian
4 = Caucasian (i.e. White)
5 = None of the above

4. Who are you expecting to see today?

*Please touch your response and then touch the “NEXT” button on the right-hand corner.*

1 = My usual doctor
2 = Not my usual doctor
3 = Practice nurse
4 = Don’t know

If 1 and 2 is selected for Q4

5a. Approximately, how many times have you seen this GP in the last 12 months?

a = 0
b = 1
c = 2
d = 3
e = 4
f = 5
g = 6
h = 7
i = 8
j = 9
k = 10
l = More than 10
Module 2: Personal health history

The following questions are about your health.

1. Have you ever been told by a doctor or nurse that you have any of these conditions?

*Please touch all that apply and then touch “NEXT”.*

1 = High blood pressure
2 = High cholesterol
3 = Heart problems (e.g. blocked arteries, heart attack)
4 = Diabetes (or high blood sugar) Go to 1a
5 = Kidney disease
6 = Depression
7 = Stroke
8 = Chronic pain
9 = None of the above

1a. What type of diabetes were you told you had?

*Please touch your response and then touch “NEXT”.*

1 = Type 1 (Usually starts in childhood, needs daily insulin injection)
2 = Type 2 (Usually starts in adulthood, may not need insulin injection)
3 = Gestational (occurs during pregnancy)
4 = Pre-diabetes (high blood sugar; this includes impaired glucose tolerance and impaired fasting glucose)

2. Which of the following best describes your smoking status? This includes cigarettes, cigars and pipes.

*Please touch your response and then touch “NEXT”.*
1 = I smoke daily
2 = I smoke occasionally
3 = I don’t smoke now, but I used to
4 = I have tried if a few times but never smoked regularly
5 = I have never smoked

3. Were any of your close BLOOD relatives (parents, brothers, sisters or children) ever diagnosed with heart disease?

*Please touch your response and then touch “NEXT”.*

1 = Yes
2 = No
3 = Not sure

*If I selected for Q3*

3a. Were they diagnosed at 60 years of age or younger?

*Please touch your response and then touch “NEXT”.*

1 = Yes
2 = No
3 = Not sure
Module 4: Lifestyle risk factors

The following questions are about lifestyle factors and habits that can affect your health.

1. How often do you usually have a drink containing alcohol?
   Please touch your response and then touch the “NEXT” button on the right-hand corner.
   
   1 = Never
   2 = Monthly or less
   3 = 2–4 times per month (once a week or once every 2 weeks)
   4 = 2–3 times per week
   5 = 4 or more times per week

2. On a typical day that you have an alcoholic drink, how many STANDARD drinks do you usually have?
   
   Note: One middy/100mls of wine = 1 standard drink
   One schooner/375ml premixed can = 1.5 standard drinks
One bottle of wine = 7 standard drinks

3. How often do you have 4 or more drinks on one occasion?

Please touch your response and then touch the “NEXT” button on the right-hand corner.

1 = Never
2 = Less than monthly
3 = Monthly
4 = Weekly
5 = Daily or almost daily

4. As a rule, do you do at least half an hour of moderate or vigorous exercise (such as walking or sport) on five or more days a week?

Please touch your response and then touch the “NEXT” button on the right-hand corner.

1 = Yes
2 = No
3 = Unsure

5. Please enter your weight in kilograms. If you only know your weight in stones, please press “NEXT”.

Please insert using number pad provided. Use the decimal point if needed.

If none answered for Q5

5a. Please enter your weight in STONE.
6. How tall are you without shoes?

*Please give your best estimate.*

☐ feet ☐ ☐ inches

If none answered for Q6

6a. **Please enter your height in centimetres (cm)**

*Please insert using number pad provided. Use the decimal point if needed.*
Module 5: Weight changes

1. Have you tried to change your weight in the past 12 months?
   1 = Yes, have tried to lose weight
   2 = Yes, have tried to gain weight
   3 = No
   4 = Not sure

*If Module 5, Q1, 2 is selected:*

2. What strategies have you used to gain weight in the past 12 months? *Select all that apply*
   1 = Prescription medication
   2 = Over the counter supplements
   3 = Changed my diet
   4 = Increased exercise
   5 = Other
This information is useful for answering the next question. Please touch "NEXT" when you are ready to answer the next question.

3. Which strategies have you tried to lose weight in the past 12 months?

Select all that apply.

1 = Professional weight-loss centre program (e.g. Jenny Craig)
2 = Prescription medication
3 = Surgery
4 = Over-the-counter supplements
5 = Increased exercise
6 = Changed diet
7 = Consulted a weight-loss specialist
8 = Other

If Module 5, Q3, 8 is selected:
3a. Please specify what other strategies you used.

If Module 5, Q3, 1-7 is selected:

3b. Did you consult your GP before using these weight-loss strategies?

1 = Yes
2 = No

This information is useful for answering the next question. Please touch "NEXT" when you are ready to answer the next question.

**Specialised meal replacements**
Meal replacements are foods that are taken as a substitute for a solid food meal. They can come in the form of drinks, snack bars or frozen meals.

**Low-calorie diet**
This is when you restrict your food intake so that you reduce the overall calories consumed.

**Low-carbohydrate/high-protein diet**
This includes a diet low in carbohydrates (such as rice, bread and pasta) and high in protein (such as meat, eggs and dairy foods). An example of a low-carbohydrate diet is the Atkin’s diet.

**Low-fat diet**
This diet includes intentionally cutting down on fat in your diet. Examples of food that are high in fat are high-fat meat, cake, pastries and snack food.

**Detox diet**
Detox diets involve not consuming or attempting to flush out substances that are considered harmful. Examples include restricting certain food that contain colourings or preservatives and taking supplements to induce diarrhoea.

**High-fibre diet**
This diet involves intentionally increasing the fibre content of your diet. Some examples of food high in fibre are vegetables, fruit and wholegrain products.

**Celebrity/fad diets**
These diets involve making extreme, rapid changes to food consumption, often recommended in celebrity magazines. Examples include grapefruit diet, cabbage soup diet.
Please touch all that apply

1 = Specialised meal replacements
2 = Low-calorie diet (reduced food)
3 = Low-carbohydrate diet (Atkins diet)
4 = Low-fat diet
5 = Detox diet
6 = High-fibre diet
7 = Celebrity/fad diets
8 = Other

If Module 5, Q3c, 9 is selected:

3d. Please specify what diet you have used in the last 12 months.

_____________________________________________________________________

4a. Did these strategies help you gain weight in the last 12 months?

1 = Yes, gained weight
2 = No, weight has not changed
3 = No, lost weight
4 = Not sure

Intending to change weight in this question means that you have considered the benefits and costs of changing your weight. You are planning to make the required changes in the next 6 months in order to achieve this.

5. Do you intend to change your weight in the next 6 months?

Please touch your response and then touch the “NEXT” button on the right-hand corner.
If Module 5, Q5 = 2 is selected

5a. Why do you want to lose weight in the next 6 months?

Please rank up to 3 in order of importance. Touch the most important reason first, followed by the second and third most important reasons.

1 = For health reasons
2 = To increase my physical fitness
3 = To increase my confidence
4 = To improve my appearance
5 = To achieve my ideal weight
6 = To feel better
7 = I am currently overweight
8 = To fit into my old clothes
9 = Other

If Module 5C, Q5 = 2 is selected

6. Which of the following personnel would you like assistance from to change your weight?

Rank up to 3 health professionals you would like help from in order of preference. Touch your first preference, followed by the second and third.

1 = General practitioner
2 = Nursing staff
3 = Dietitian
4 = Psychologist
5 = Exercise Physiologist
6 = Surgeon
7 = Weight-loss consultant
8 = None of the above

7. Would you be willing to receive support with managing your weight via the following devices?

*Please select an answer for each row. Please select “No access” if you do not have regular access to any of the devices.*

| a) Telephone | 1 = Yes 2 = No 3 = No access |
| b) Email | 1 = Yes 2 = No 3 = No access |
| c) Short messaging service (SMS) | 1 = Yes 2 = No 3 = No access |
| d) Smart phone/tablet application | 1 = Yes 2 = No 3 = No access |
| e) Online chat | 1 = Yes 2 = No 3 = No access |
Module 6: Demographics

1. Have you been to this clinic before?
   1 = Yes
   2 = No

If yes for 1 is selected;

2. Please indicate the area(s) of your general practice care at THIS CLINIC that you would have liked improved.

   Please rank as many as apply in order of importance to you. Touch the most important first.

   1 = Management of my physical symptoms
   2 = Information and communication about my health-care
   3 = Emotional support
   4 = Involvement of and support of my family/friends
   5 = Being treated compassionately and with dignity
   6 = Access to health-care when needed
   7 = Support to cope with my relationships
   8 = Assistance with practical concerns (e.g. child care)
   9 = No improvements in any of these areas needed.

3. I would like to get advice from my doctor about:

   Please rank up to 3 issues, in order of importance. Touch the most important issue first, followed by the second and third issue.

   1 = Changing health risk behaviours (e.g. smoking, weight)
   2 = Coping with emotional problems (e.g. depression, anxiety)
   3 = Cancer screening
   4 = Screening for heart disease risk factors (e.g. blood pressure)
5 = Muscle/joint pain
6 = Feeling weak or tired
7 = Problems with digestion
8 = Family planning or sexual health
9 = None of the above

4. Given your current health and lifestyle habits (e.g. weight, exercise levels, alcohol intake, smoking, screening behaviours), what do you think your risk of dying from a chronic disease in the next 10 years is compared to another person your age?

*Please touch your response and then touch the “NEXT” button on the right-hand corner.*

1 = Much lower than other people
2 = Somewhat lower than other people
3 = The same as other people
4 = Somewhat higher than other people
5 = Much higher than other people

5. Which of the following best describes the main reason you are visiting the doctor today?

*Please touch your response and then touch the “NEXT” button on the right-hand corner.*

1 = For a new problem
2 = For an existing or chronic problem
3 = For a work-related problem
4 = For a medication problem or to get a prescription
5 = For a treatment
6 = To get the results of tests
7 = For a general check-up
8 = To get a referral to a specialist
9 = To get vaccinated (e.g. ‘flu shot)
10 = Other

6. Why did you choose to come to this general practice?

Please choose up to 3 and rank in order of importance. Touch the most important factor first, followed by the second and third.

1 = It is close to where I live / work.
2 = It is easy to travel to this practice
3 = This practice bulk bills
4 = I am usually able to see the same doctor each time I come
5 = I feel comfortable with the doctors here
6 = It is the only place where I can see a doctor
7 = The reception staff in this practice are very helpful
8 = The practice offers after-hours consultations
9 = I bring other family members to this practice
10 = This practice offers drop-in appointments
11 = It is easy to find parking
12 = I like the doctors here

7. What is the highest level of education you have completed? Please select only one.

Please touch your response and then touch the “NEXT” button on the right-hand corner.

1 = Primary school
2 = Some high school
3 = Year 10 (School Certificate)
4 = Higher School Certificate (Year 12)
5 = Completed TAFE Certificate or Diploma
6 = University or other tertiary qualification

7 = Postgraduate qualification (Masters or Doctorate)

8 = Other

8. Do you have:

a) A health-care card 1 = Yes 2 = No

b) A Veteran Affairs card 1 = Yes 2 = No

c) Private health insurance 1 = Yes 2 = No

d) Pensioner concession card 1 = Yes 2 = No

9. What is the postcode where you live? _____________
Appendix 8.6.4: Example images of touch screen computer questionnaire

Information screens

Consent screen
Number pad

Single-choice question
Grid questions

Over the last 2 weeks, how often have you been bothered by any of the following problems?

Please touch the number that best applies to you. Touch one response for each row and then touch NEXT.

- Trouble falling or staying asleep too much: Not at all (1), Several days (2), More than half the days (3), Nearly every day (4)
- Feeling tired or having little energy: 1, 2, 3, 4
- Poor appetite or overeating: 1, 2, 3, 4
- Feeling bad about yourself or that you are a failure or have let yourself or your family down: 1, 2, 3, 4
- Little interest or pleasure in doing things: 1, 2, 3, 4

Ranking questions

Why do you want to lose weight? Please rank up to 3 reasons in order of importance.

In order of importance, touch the 1st, 2nd and then 3rd most important reason, then touch NEXT.

- For health reasons
- To improve my appearance
- To increase my confidence
- To feel better
- To increase my physical fitness
- To achieve my ideal weight
- I am currently overweight
- To fit into my old clothes

BACK NEXT
Keypad

How tall are you without shoes? Please give your best estimate. If you only know your height in CM, please touch 'NEXT'.

Please touch the FEET button and then insert your response. Then touch the inches button and insert your response.

FEET 5 INCHES

BACK NEXT
# Appendix 8.7.1: Research Assistant Recruitment Log Sheet

## General Practice Recruitment Log Sheet

<table>
<thead>
<tr>
<th>DATE</th>
<th>CLINIC NAME</th>
<th>RA NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exclusions</th>
<th>Consent?</th>
<th>If yes, ID#</th>
<th>Comp #</th>
<th>Sex</th>
<th>Approximate age group</th>
<th>Consent to measure</th>
<th>Completion mode (circle)</th>
<th>Interview style</th>
<th>Consent to measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visually impaired</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Too sick</td>
<td>No</td>
<td>Yes</td>
<td>M</td>
<td>F</td>
<td>&lt;25</td>
<td>25-34</td>
<td>35-44</td>
<td>45-54</td>
<td>55-64</td>
</tr>
<tr>
<td>Non-English</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td>No</td>
<td>Yes</td>
<td>M</td>
<td>F</td>
<td>&lt;25</td>
<td>25-34</td>
<td>35-44</td>
<td>45-54</td>
<td>55-64</td>
</tr>
<tr>
<td>Other</td>
<td>No</td>
<td>Yes</td>
<td>M</td>
<td>F</td>
<td>&lt;25</td>
<td>25-34</td>
<td>35-44</td>
<td>45-54</td>
<td>55-64</td>
</tr>
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</table>

---

**Survey completed**

<table>
<thead>
<tr>
<th>DAILY TOTALS</th>
<th>DAILY TOTALS</th>
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</thead>
<tbody>
<tr>
<td>Approached</td>
<td>PSA</td>
</tr>
<tr>
<td>Ineligible</td>
<td>Dep</td>
</tr>
<tr>
<td>Refused</td>
<td>Wt</td>
</tr>
<tr>
<td>Consented</td>
<td>Doctor</td>
</tr>
<tr>
<td>Completed</td>
<td>Hours</td>
</tr>
</tbody>
</table>

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# Appendix 8.7.2: Recording of Physical Measurements Log Sheet

Date: ___________________________  Block: <Pre-filled prior to data collection>

Practice: ___________________________  Session: ___________________________

Name of person measuring ___________________________

<table>
<thead>
<tr>
<th>No</th>
<th>Participant ID</th>
<th>Weight (kg)</th>
<th>Height (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
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<tr>
<td>6</td>
<td></td>
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<td></td>
</tr>
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<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
APPENDIX 9: ADDITIONAL APPENDICES
APPENDIX 9.1: Comparison Of General Practice Patients’ And General Practitioners' Characteristics With The Bettering The Evaluation And Care Of Health Study

Table 1: Demographic characteristics of consenting patients and Bettering the Evaluation and Care of Health study participants (n=95,839)

<table>
<thead>
<tr>
<th></th>
<th>Study participants n (%) [95% CI]^a</th>
<th>BEACH participants n (%) [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2059 (61) [59–64]</td>
<td>54234 (57) [56–58]</td>
</tr>
<tr>
<td>Male</td>
<td>1290 (39) [36–43]</td>
<td>40717 (43) [42–44]</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>236</td>
<td>n/a</td>
</tr>
<tr>
<td>45–64</td>
<td>1159 (38) [34–43]</td>
<td>22,298 (31) [30–32]</td>
</tr>
<tr>
<td>≥65</td>
<td>962 (32) [26–39]</td>
<td>27,523 (39) [38–30]</td>
</tr>
<tr>
<td><strong>New patient to practice</strong></td>
<td>181 (5.9) [4.8–7.5]</td>
<td>6871 (7.3) [6.6–7.9]</td>
</tr>
<tr>
<td><strong>Commonwealth concession card (n=3013)^b</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1168 (39) [33–45]</td>
<td>39618 (45) [44–56]</td>
</tr>
<tr>
<td>No</td>
<td>1860 (61) [55–67]</td>
<td>48650 (55) [54–57]</td>
</tr>
<tr>
<td><strong>Repatriation health card (n=3028)^a</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>82 (2.7) [1.7–4.2]</td>
<td>2170 (2.5) [2.3–2.7]</td>
</tr>
<tr>
<td>No</td>
<td>2946 (97) [96–98]</td>
<td>84482 (98) [97–98]</td>
</tr>
</tbody>
</table>

BEACH: Bettering the Evaluation and Care of Health; CI: Confidence interval; n/a: Not available

^BEACH groups participants aged 15–24 years together. This was excluded from the current table and proportions were recalculated with only participants aged ≥25 years. Data from Britt H, Miller GC, Charles J, et al. General practice activity in Australia 2010-11. General Practice series no. 29. Sydney: Sydney University Press. 2011.

^95% CI adjusted for clustering

^Number less than total due to incomplete surveys

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Table 2: Participating general practitioner characteristics in twelve practices (n=51) compared with the Bettering the Evaluation and Care of Health study dataset (n=958)

<table>
<thead>
<tr>
<th></th>
<th>Study participants</th>
<th>BEACH participants</th>
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<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
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</tr>
<tr>
<td>Male</td>
<td>32 (63)</td>
<td>557 (56)</td>
</tr>
<tr>
<td>Female</td>
<td>19 (37)</td>
<td>413 (44)</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
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<tr>
<td>25–44</td>
<td>12 (24)</td>
<td>280 (28)</td>
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<td>45–54</td>
<td>20 (39)</td>
<td>360 (37)</td>
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<tr>
<td>≥55</td>
<td>19 (37)</td>
<td>342 (35)</td>
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<tr>
<td><strong>Years in general practice</strong></td>
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<tr>
<td>≤ 5</td>
<td>4 (7.8)</td>
<td>98 (10)</td>
</tr>
<tr>
<td>6–19</td>
<td>14 (27)</td>
<td>350 (26)</td>
</tr>
<tr>
<td>≥20</td>
<td>33 (65)</td>
<td>533 (54)</td>
</tr>
<tr>
<td><strong>Direct patient hours</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 20</td>
<td>13 (25)</td>
<td>103 (11)</td>
</tr>
<tr>
<td>21–40</td>
<td>37 (73)</td>
<td>547 (56)</td>
</tr>
<tr>
<td>41–60</td>
<td>1 (2.0)</td>
<td>300 (31)</td>
</tr>
<tr>
<td>&gt;60</td>
<td>0 (0)</td>
<td>23 (2.4)</td>
</tr>
</tbody>
</table>

BEACH: Bettering the Evaluation and Care of Health study