Weight Perceptions and Health Education on Obesity Among Older Adults

Contents

Summary of Findings and Recommendations

The current brief presents preliminary findings from a special module that measures perceptions of weight and receptivity to health education among older adults. Singapore Life Panel® (SLP) data collected in January 2022 (n=2814) were utilized. A summary of the findings and recommendations made in this brief is provided below:

Key findings

1. Nearly 50% of the participants perceived their body weight as the normal weight, followed by more than 40% who perceived overweight, and 10% who perceived underweight.
2. 30.8% of participants underestimated their actual weight (as measured by BMI) and 8.4% overestimated their actual weight.
3. Participants more willing to receive to health education were more likely to have a higher level of overall life satisfaction ($p < .05$).

Policy recommendations

Based on the findings listed above, the current brief makes two general policy recommendations for consideration:

1. The main findings highlight that weight misperception is prevalent among older adults. More than a third of respondents (39%) incorrectly perceive their weight status, particularly among overweight and obese older adults, as well as Malay and lower educated respondents. This suggests the importance of public health education for older adults to reduce misperceptions about their own over- and under-weight status, thereby promoting healthier behaviours and well-being in the long run.
2. In addition, the initial results indicate the well-being inequality by the willingness to learn about healthy lifestyles. The well-being gap is likely to become larger as those with a higher level of life satisfaction are more willing to take health education. This highlights the importance of focusing public health education and health awareness campaigns among disadvantaged populations.

Introduction

Knowing is half the battle. Weight management is an important aspect to the physical well-being of older adults. Overweight and underweight older adults are at higher risk of various health conditions ranging from diabetes to frailty (Blaum et al., 2005; Sairenchi et al., 2008; Villareal et al., 2004). From 2017 to 2020, increases in obesity prevalence were observed across all age groups in Singapore, most notably among older adults aged 50-74 years (Ministry of Health, 2020). In 2020, about one in five (20.3%) older adults aged 60-74 years were in the high-risk body mass index (BMI) group (Ministry of Health, 2020). In addition, abdominal obesity was observed in more than half of older adults aged 60-74 years (56.9%), followed by nearly half of older adults aged 50-59 years (48.8%) (Ministry of Health, 2020).

As such, an accurate weight perception is the first step toward promoting health behaviours and health among overweight and obese adults. Weight misperception among overweight and obese adults is associated with a lower likelihood of attempting weight loss (Duncan et al., 2011; Hassan et al., 2018). Park et al. (2017) also found that a high BMI and inaccurate weight perception are associated with lower levels of health-related quality of life among Korean older adults.

Data and Study Design

The current brief utilizes data from the Singapore Life Panel® (SLP), a monthly panel survey that has been conducted since July 2015. Respondents are part of a nationally representative sample of older adult Singaporeans and their spouses aged 57–76 years (in 2022). We conducted an ad hoc, one-off module in January 2022 along with other SLP survey questions (wave 78) to assess their perceptions about obesity(weight) status and willingness to learn about heathy life style. A total sample of 2814 respondents participated in this module .

Outcomes to be reported in this brief include: weight perception, willingness to accept health information, and health-related behaviours and well-being such as healthcare expenditure and utilization, self-reported health, depressive symptoms, and life satisfaction.

The participants were presented with a two-part intervention: (1) the first part asked if a participant is interested in receiving educational information on obesity, and (2) the second part provided educational information about obesity. The first group of randomly selected participants were asked if they are interested in receiving educational information on obesity to identify if receptiveness to health information influences the efficacy of health education. This first group was then grouped into a control and treatment group. The second group of randomly selected participants was also grouped into a control and treatment group. See Figure A1 for details regarding the study design. Participants from the treatment groups were provided with three sets of health information: (1) body weight category based on BMI calculation (see Appendix: Figure A2), (2) benefits of weight management and potential risks of underweight and overweight on obesity (see Appendix: Figure A3), and (3) suggestions on physical activity and nutrition for improving weight management (see Appendix: Figure A4 and Figure A5).

Appropriate weight management interventions for older adults remain controversial because of associated health risks to this population, including increased sarcopenia and frailty (Batsis et al., 2017). However, the existing literature on older adult weight-related interventions in clinical settings has shown that a combination of physical activity and diet components, rather than physical activity

or diet alone, is most effective at improving physical functional health and quality of life, as well as protecting against accelerated muscle and bone losses (Gill et al., 2015; D. T. Villareal et al., 2017). For this reason, this health education intervention included information on both exercise and nutrition as recommendations for weight management.

Key Findings

In this section, we examine preliminary findings on older adults' self-perceived weight, BMI scores, willingness to accept health information, and health-related behaviours and well-being.

Weight perception and BMI

To measure self-perceived weight, we asked participants how they would best describe their current weight on a 5-point scale (1 – Very underweight to 5 – Very overweight).
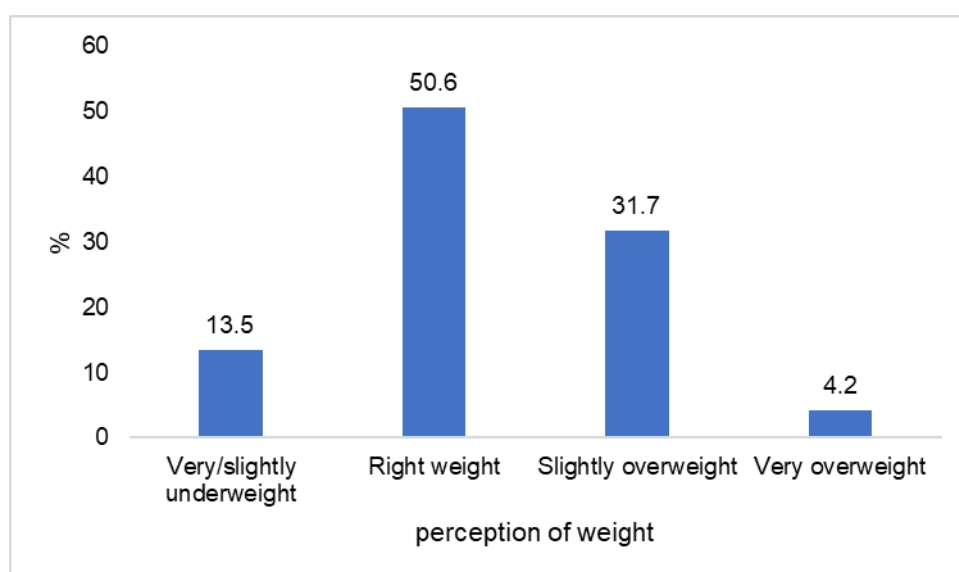

Figure 1: Weight perception among older adults (n=2814)

Figure 1 shows half (50.6%) of participants perceived their weight as the "right weight." Of those who perceived themselves to be outside of the suitable weight range, 35.9% perceived themselves to be "very/slightly overweight" compared to 13.5% who perceived "very/slightly underweight." To assess the accuracy of participants' self-perceived weight, we examined participants' BMI scores in the next section.
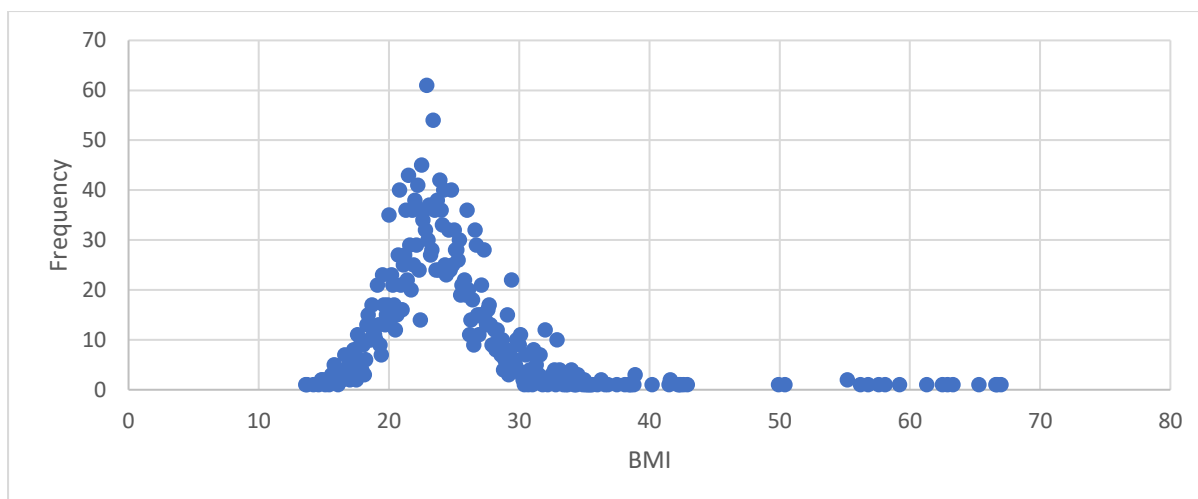
Figure 2: Distribution of BMI scores (n=2801)

Figure 2 shows a distribution of participants' BMI scores at the start of the intervention in January 2022. Based on the right-skewed shape of the distribution, we observed a greater proportion of overweight (BMI score 23-27.5) and obese (BMI score ≥ 27.5) compared to underweight (BMI score < 18.5).

Variable	Underweight Row (%)	Normal weight Row (%)	Overweight or Obese Row (%)
Gender			
Male (n = 1338)	2.84	33.18	63.98
Female (n = 1482)	7.69	41.70	50.61
Age group			
57-61 (n = 737)	4.61	39.21	56.17
62-66 (n = 862)	4.41	36.54	59.05
67-71 (n = 582)	6.19	38.66	55.15
72-76 (n = 467)	6.42	33.83	59.74
Race			
Chinese (n = 2529)	5.65	39.62	54.73
Malay (n = 101)	2.97	21.78	75.25
Indian (n = 137)	3.65	19.71	76.64
Other (n = 51)	1.96	21.57	76.47
Education			
Primary/none (n = 550)	5.45	33.82	60.73
Secondary (n = 997)	6.72	38.42	54.86
Post-secondary without tertiary (n = 674)	4.90	37.69	57.42
Post-secondary with tertiary (n = 590)	3.73	39.83	56.44
Housing type			
HDB 1-3 Room (n = 476)	7.35	34.03	58.61
HDB 4-5 Room and Executive Condo (n = 1659)	5.00	37.97	57.02
Private apartment/property (n = 580)	4.83	41.38	53.79

Table 1: Demographic distributions of underweight, normal weight, and overweight/obese groups (n=2820)

As shown in Table 1, across major sociodemographic domains (i.e., gender, age, ethnicity, education, and housing type), proportions of overweight and obese were considerably higher than underweight and normal weight. In terms of gender, there was a slightly larger proportion of males (63.98%) who were overweight or obese, compared to females (50.61%). In terms of race, proportions of overweight and obese were lowest among Chinese (54.73%) participants, compared to Indian (76.64%), Malay (75.25%), and Other (76.47%) participants. Less educated participants made up the largest proportion of overweight and obese, with 60.73% of those with Primary or no formal education in the highest weight ranges, compared to 56.44% with tertiary education degrees.
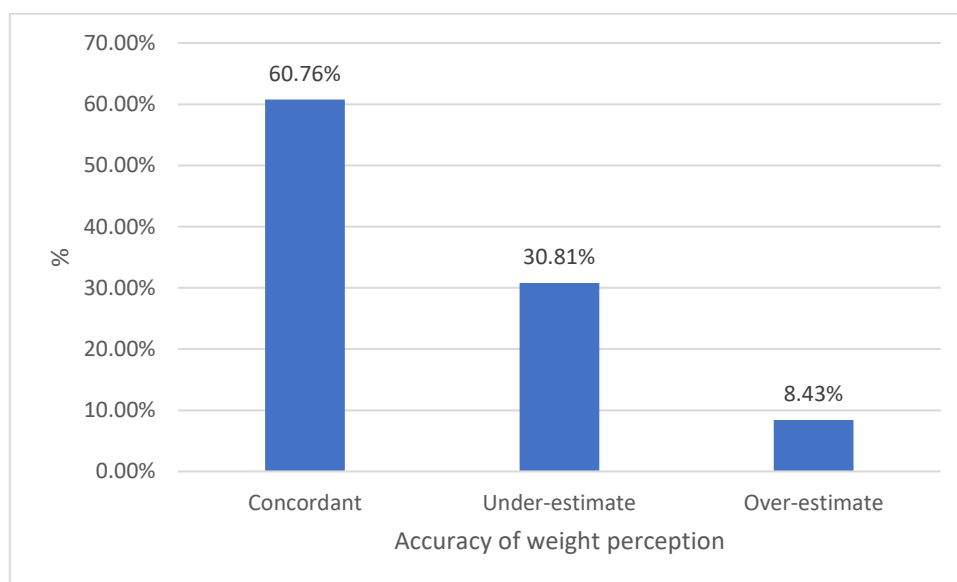

Figure 3: Weight misperception by comparing self-perceived weight and BMI scores (n=2801).

Note: the result was based on participants who were included in the study and had no missing self-perception of weight and BMI value.

Figure 3 illustrates the accuracy of participants' weight perceptions by comparing self-perceived weight with actual BMI scores. Participants in the "concordant" group (60.76%) accurately perceived their true weight, as measured by BMI score. Those in the "overestimate" group (8.43%) perceived their weight to be higher than it actually was, and those in the "underestimate" group (30.81%) perceived their weight to be lower than it actually was. These findings suggest that older adults are more likely to underestimate rather than overestimate their true weight. To investigate if certain groups of older adults may be more prone to mis-perceiving their weight, we subsequently calculated the proportions of participants within several demographic groups who accurately perceived (concordant) or misperceived (either under-estimated or over-estimated) their weight (Table 2 below).

Variable	Concordant Row (%)	Under-estimate Row (%)	Over-estimate Row (%)
Gender			
Male (n = 1328)	57.08%	38.25%	4.67%
Female (n = 1473)	64.09%	24.10%	11.81%
Age group			
57-61 (n = 735)	61.77%	27.21%	11.02%
62-66 (n = 849)	59.36%	31.57%	9.07%

	62.35%	30.92%	6.74%
67-71 (n = 579)	62.35%	30.92%	6.74%
72-76 (n = 466)	56.01%	37.34%	6.65%
Race			
Chinese (n = 2512)	61.86%	29.14%	9.00%
Malay (n = 100)	46.00%	51.00%	3.00%
Indian (n = 136)	53.68%	43.38%	2.94%
Other (n = 51)	56.86%	37.25%	5.88%
Education level			
Primary/none (n = 551)	53.72%	40.11%	6.17%
Secondary (n = 987)	60.59%	30.60%	8.81%
Post-secondary without tertiary (n = 667)	62.67%	27.74%	9.60%
Post-secondary with tertiary (n = 587)	65.42%	26.06%	8.52%
House type			
HDB 1-3 Room (n = 473)	58.77%	31.92%	9.30%
HDB 4-5 Room and Executive Condo (n = 1646)	59.84%	31.96%	8.20%
Private Apartment/Property (n = 576)	65.97%	25.35%	8.68%

Table 2: Demographic distributions of accuracy of weight perceptions

The results in Table 2 demonstrate that among participants, men are more likely to under-estimate their weight while women are more likely to over-estimate their weight. Older participants are also more likely to under-estimate their weight, with 37.34% of participants aged between 72 and 76 under-estimating their weight, as compared to 27.21% of respondents aged between 57-61. The opposite is true for over-estimations of weight, with younger participants being more likely to over-estimate their weight. In terms of race, we find that about half of the Malay participants (51.00%) under-estimated their weight compared to almost a third of Chinese participants (29.14%). Participants with lower education were also less likely to accurately perceive their weight – only 53.72% of participants with primary/no education did so, compared to 65.42% of respondents with a post-secondary and tertiary education. These respondents were more likely to under-estimate their weight, with 40.11% of respondents with primary/no education under-estimating their weight, compared to just 26.06% of respondents with a post-secondary and tertiary education. Finally, in terms of housing type, we see less variation in the likelihood of mis-perceiving their weight, although respondents living in smaller housing types were slightly more likely to misperceive their weight.

Self-perceived BMI category / **Actual BMI category**	**Underweight and at risk of nutritional deficiency** (BMI score < 18.5)	**Normal weight and low health risk** (BMI score 18.5- 22.9)	**Overweight and moderate health risk** (BMI score 23-27.5)	**Obese and high health risk** (BMI score ≥ 27.5)
Very/slightly underweight	71.05% Concordant	14.5% Underestimate	38.69% Underestimate	63.95% Underestimate
About the right weight	28.95% Overestimate	71.19% Concordant	38.69% Underestimate	63.95% Underestimate
Slightly overweight	28.95% Overestimate	14.31% Overestimate	58.42% Concordant	2.89% Overestimate
Very overweight	28.95% Overestimate	14.31% Overestimate	2.89% Overestimate	36.05% Concordant

*Table 3: Weight misperception by comparing self-perceived weight and health risk (by BMI category) (n=2814) (percentages presented are **row** percentages)*

Table 3 illustrates the accuracy of participants' self-perceived weight in relation to their respective BMI categories (and associated health risks). Upon preliminary examination, we found higher proportions of weight concordance (indicated in green) among participants with BMI score ≤22.9 (i.e., underweight or normal weight) and lower proportions of weight concordance among participants with BMI score ≥23 (i.e., overweight or obese). This suggests that overweight and obese participants were generally less likely to perceive their weight accurately. In addition, proportions of weight underestimation were relatively higher among overweight (38.69%) and obese (63.95%) participants.

Willingness to accept health information

To assess whether receptiveness to health information influences the efficacy of health education, Group 1 (n=1393) was asked if they would be willing to receive health information, while Group 2 (n=1421) was not. Both groups were then divided into control and treatment groups respectively, with the treatment groups receiving a set of health information on obesity.
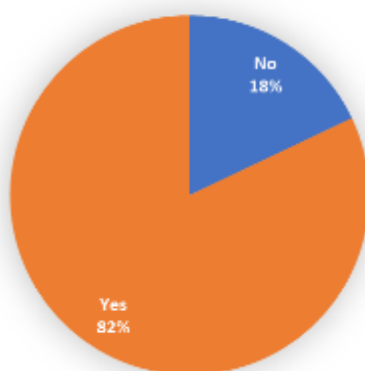

Figure 4: Willingness to accept health information in group 1

A shown in Figure 4, 82% of participants in Group 1 reported "yes" and those assigned to treatment group were then provided with a set of health information (see Appendix: Figures A2-A5). The remaining 18% of participants who reported "no" were not provided any health information and were excluded from analysis.
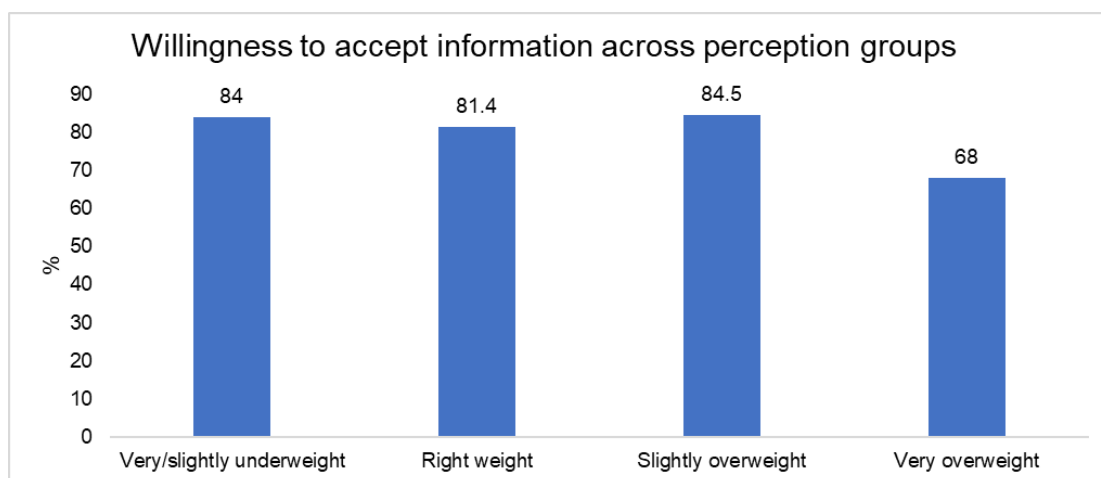

Figure 5: Willingness to accept health information across weight perception groups (n=1393)

Across weight perception groups, participants who perceived "slightly overweight" (84.5%) were the most willing to receive health information on obesity (see Figure 5 above). Participants who perceived "very overweight" (68%) were the least willing to receive health information on obesity.

Discussion

The Ministry of Health recently unveiled a new model of preventive care, called *Healthier SG*, which aims to reform healthcare infrastructure and drive population health (Ministry of Health, 2022). This represents both a paradigm shift in the way healthcare is approached in Singapore, as well as highlights the importance of examining the efficacy of healthcare systems and interventions. In light of this, while the current policy takes active steps in ensuring that the optimal healthcare infrastructure is in place, the current brief concurrently aims to understand how older adults' weight perceptions influence their willingness to accept health information, and to evaluate the effectiveness of health education interventions on older adults' health-related behaviours and well-being.

The brief aims to highlight three main sets of findings on the (1) accuracy of weight perceptions among older adults, and (2) willingness to accept health information across weight perception groups. Firstly, the findings on weight perceptions underscore the importance of health education for older adults, as weight misperception can potentially lead to adverse health-related behaviours and outcomes. When comparing self-perceived weight with actual BMI scores, we found that more than a third of participants incorrectly perceived their weight, with more participants underestimating rather than overestimating their true weight (see Figure 3 above). Weight underestimation was relatively highest among overweight and obese participants (see Table 3 above). The significance of these findings is that health risks and appropriate weight management interventions vary across BMI categories. Older adults who misperceive (i.e., underestimate or overestimate) their weight may not be employing the most appropriate approach at managing their weight and health.

Secondly, weight perceptions were shown to play a role in determining older adults' willingness to accept health information on obesity. Across the three lowest weight perception groups, levels of willingness to accept health information were fairly high, ranging from 81.4 to 84.5%, however it is concerning that only 68% of participants in the highest weight perception group ("very overweight") were willing to accept health information on obesity (see Figure 5 above). This suggests a need for targeted health education interventions aimed at older adults, and particularly obese older adults.

Key Recommendations

This brief offers two main recommendations aimed at improving accuracy of weight perceptions and overall health and well-being among older adults:

1. The main findings highlight that weight misperception is prevalent among older adults with more than a third of respondents (39%) incorrectly perceiving their weight status. This is particularly prevalent among overweight and obese older adults, as well as Malay and lower educated respondents. Increasing the frequency of public health education for older adults could be useful in reducing weight misperceptions and promoting healthier behaviours and well-being in the long run.

In addition, the initial results indicate the well-being inequality by the willingness to learn about healthy lifestyles. The well-being gap is likely to become larger as those with a higher level of life satisfaction are more willing to take health education. This highlights the importance of focusing public health education and health awareness campaigns among disadvantaged populations.

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Appendix

Figure A1: Study design
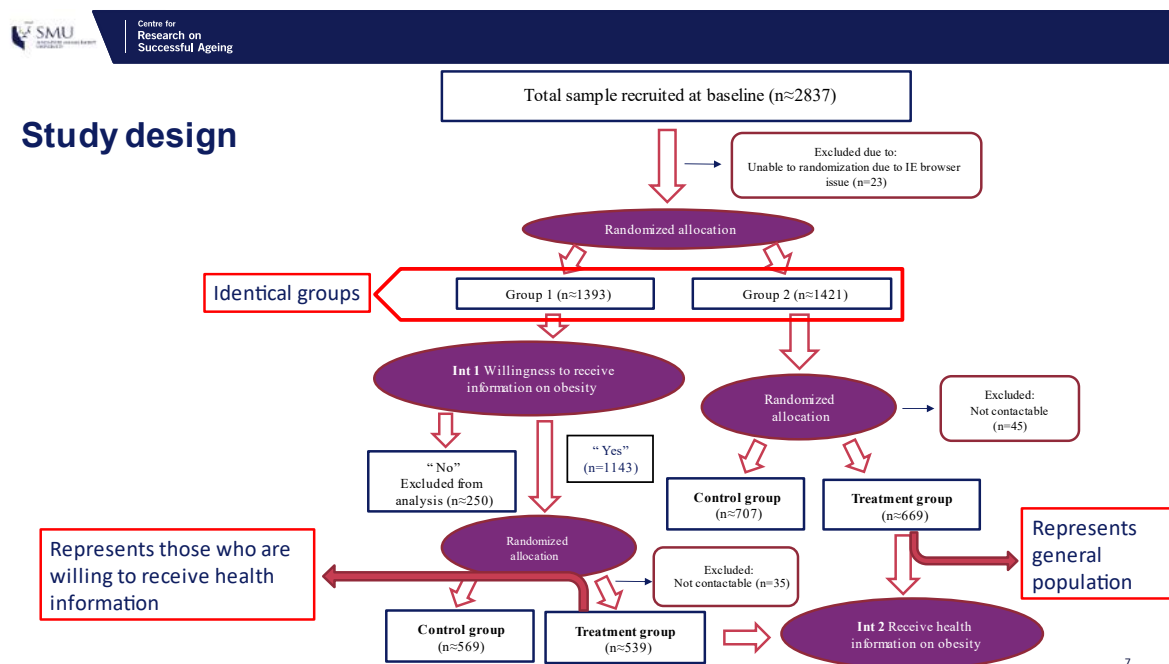
Figure A2: Health information 1 - Body weight category based on preceding provided BMI value

BMI range	<18.5	18.5-22.9	23-27.4	27.5-32.4	>32.5
Category	Underweight	Normal weight	Overweight	Obese	Very obese
Health risk	At risk of nutritional deficiency	Low	Moderate	High	Very high

(Note: If your BMI value is categorized under overweight, obese or underweight, don't be anxious! Any healthy movement counts! In addition, you are advised to seek medical advice on weight management if you feel unwell.)

Figure A3: Health information 2 - Benefits of weight management and potential risk of underweight, overweight or obesity

Maintaining a healthy weight is important for your health because an unhealthy weight increases your risk of many health problems, such as:

For overweight and obesity: heart disease, stroke, high blood pressure, type 2 diabetes, and gout.	For underweight: osteoporosis, anemia, nutritional deficiencies and a weakened immune system.
Maintaining a healthy weight can bring about **health benefits** and reduce your chance to developing these diseases and conditions. It can also improve your **sleep, mood, and reduce your stress.**	

Figure A4: Health information 3.1 - Suggestions on exercise for improving weight management

To maintain a healthy weight, give these a try!

Daily Exercise:	**Weekly** Exercise:
• **Walking** to run errands instead of driving or riding the MRT/bus • Alighting at one or more MRT/bus stops earlier, or parking further away than usual to walk to a destination • **Standing or moving around** for 5 to 10 minutes when you have been sitting for more than 90 minutes	• 150–300 minutes of **moderate-intensity** physical activity[1] OR, • 75–150 minutes of **vigorous-intensity** physical activity OR, • A combination of moderate-intensity and vigorous-intensity activities.

[1] Note: If you have specific health conditions, such as cardiovascular disease and diabetes, you may need to take extra precautions and seek medical advice before trying to achieve the recommended levels of physical activity.
You should gradually increase duration, frequency and intensity over time.

Source: World Health Organization

Figure A5: Health information 3.2 - Suggestions on nutrition for improving weight management

Little changes count! • Aim for the recommended proportion of each food group • Eat sufficient amounts of grains, especially wholegrains • Eat more fruits and vegetables • Reduce fat intake, especially saturated fat • Choose food and beverages with less sugar • Stop eating when you feel full and avoid snacking	Wholegrains / Protein / Fruit and vegetables

Note: If you have specific dietary requirements or existing medical conditions, please speak with your doctor or clinician for advice that is best suited for your needs.

Source: Singapore Ministry of Health

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About the Centre for Research on Successful Ageing (ROSA)

ROSA is a multidisciplinary research centre based in SMU. It was established with an MOE Tier 3 social sciences research grant, as well as the generous support of The Ngee Ann Kongsi. Research at ROSA seeks to define and measure a holistic construct of well-being and to identify the factors that impact Singaporeans' well-being as they progress through the later phases of life. Through close collaboration with government and other partner agencies, ROSA also aims to translate research insights into policy innovations that advance the well-being of older adults holistically and promote successful ageing in Singapore. ROSA brings together a diverse team of leading international and local researchers in ageing and age-related issues from various disciplines. Through empirical evidence derived from a longitudinal methodological approach, the multidisciplinary and multi-institutional research team advances propositions that promote successful ageing in Singapore.