Perception of Chinese Pregnant Women of Weight, Obesity and Exercise, and Their Exercise Habits during Pregnancy

Jessica YP LAW MBBS, MRCOG
Department of Obstetrics and Gynaecology, Pamela Youde Nethersole Eastern Hospital, Chai Wan, Hong Kong
Chung-Nin LEE MBBS, FRCOG, FHKAM (O&G)
Department of Obstetrics and Gynaecology, Pamela Youde Nethersole Eastern Hospital, Chai Wan, Hong Kong
Chark-Man TAI MBBS, FRCOG, FHKAM (O&G)
Department of Obstetrics and Gynaecology, Pamela Youde Nethersole Eastern Hospital, Chai Wan, Hong Kong

Objective: Obesity is known to be associated with adverse maternal and fetal outcomes. Published guidelines suggest that moderate exercise for up to 30 minutes daily is safe and beneficial during pregnancy. There are nonetheless limited data for a Chinese population. This study examined the perception of pregnant women of weight, obesity and exercise during pregnancy, and their exercise habits before and during pregnancy.
Methods: This was a cross-sectional study conducted at a regional hospital in Hong Kong. Chinese pregnant women who attended an antenatal clinic for an oral glucose tolerance test during their third trimester were asked to complete a questionnaire that covered several domains, including demographic data, perception of weight and obesity in pregnancy, exercise pattern before and during pregnancy, and the perceived safety of exercise during pregnancy. Questionnaires were collected and analysed.
Results: Questionnaires were completed by 712 pregnant women. In all, 23.8% of the study population were diagnosed to have gestational diabetes. Overweight women were more likely to perceive themselves as being of normal weight ($p<0.001$). Although 47.9% of women were aware of the increased risks associated with obesity in pregnancy, only 14.1% of women knew all of the risks listed. Those who exercised before pregnancy and those who were given advice on exercise during pregnancy were more likely to exercise during pregnancy ($p<0.001$). Nonetheless only 4.5% of women who exercised before pregnancy exercised at the recommended level during pregnancy. In addition, 82.3% of women were interested in receiving more information on exercise during pregnancy. Moderate-intensity exercise once or twice per week was considered safe by 69.4% of women, but only 31% considered the same to be so for exercise more than 5 times per week.
Conclusion: Overweight pregnant women were more likely to consider their weight as normal. Awareness of pregnancy complications associated with obesity was generally lacking. Although the majority of pregnant women exercised during pregnancy, only a minor proportion exercised at the recommended level. Most women were keen to have more information about exercise in pregnancy.
Hong Kong J Gynaecol Obstet Midwifery 2015; 15(2):106-23

Keywords: Exercise; Obesity; Pregnancy

Introduction

In 2000, the World Health Organization (WHO) defined obesity in the Asian population as a body mass index (BMI) of > 25 kg/m^2 [1]. The reported age-standardised prevalence of obesity in Hong Kong Chinese women was 18.8% in 2005, making it one of the Chinese communities with the highest prevalence of obesity. At the same time, the prevalence of obesity among women in mainland China was 15.4%[2].

Obesity is known to be associated with adverse maternal and fetal outcomes[3], including gestational diabetes, pre-eclampsia, and preterm delivery. A study published in 2008 in Hong Kong confirmed these associations[4], and concluded that a high BMI may have a stronger impact in Chinese pregnant women than in their Caucasian counterparts — the prevalence of women in this study[4] with a BMI of >25 kg/m^2 was 15.8%, comparable to that of the general population.

Moderate exercise is considered beneficial in pregnancy. On the Borg scale of perceived exertion, moderate exercise was rated at 12 to 14 on a scale of 6 to 20[5]. In descriptive terms, moderate exercise was characterised as quickened breathing, but not shortness of breath, light

Correspondence to: Dr Jessica YP Law
Email: lyp007@ha.org.hk

sweating, and the ability to continue a conversation but not sing[6]. The prevalence of exercise at the recommended level in pregnancy was 15.8% in the United States[7] and 21.5% in Ireland[8]. In the UK, 42% of women exercised during pregnancy[5].

Excessive weight gain during pregnancy has been reported to be an established predictor of long-term obesity[9]. It also increased deprivation and adverse infant, childhood, and maternal outcomes[9-12]. A national study in the UK[13] suggested focusing on a healthy diet. Level of physical activity, instead of body weight, in management interventions during pregnancy was useful and less stigmatising.

Most studies of weight, obesity, and exercise in pregnancy have involved a Caucasian population and data on Asian populations are limited. Our study aimed to examine the perception of Chinese pregnant women of weight, obesity, and exercise during pregnancy and their exercise habits during pregnancy.

Methods

This was a cross-sectional study performed over a 14-week period between May and August 2013 in the obstetrics department of a regional public hospital in Hong Kong. A universal screening oral glucose tolerance test (OGTT) between 28 and 30 weeks of gestation is offered to all pregnant women who are registered at the hospital for antenatal care. All Chinese women who attended this OGTT and could read Chinese were included. Participants were given written information regarding the objective and details of the study. Written consent for the study was obtained.

Participants were asked to complete on-site a Chinese questionnaire (Appendix) that had been pilot-tested. Demographic data were collected and included parity, education level, occupation, past medical health, current obstetric problems, smoking and drinking habits, and income. Additional data on current height, weight and gestational age as well as that at booking visit were retrieved from the computerised antenatal records system. Body mass index was calculated. Given the small change in body weight during early pregnancy and to avoid recall error in pre-pregnancy weight, body weight at the booking visit was used for BMI calculation. Oral glucose tolerance test results were also retrieved from the system.

Participants were questioned about their perception of their current weight and their weight during the first 3 months of the pregnancy, and whether they perceived themselves to be underweight, normal weight, overweight, or obese. They were also assessed on their knowledge about pregnancy outcomes associated with obesity. Pregnancy complications including gestational diabetes, hypertension and pre-eclampsia, miscarriage, preterm delivery, intrauterine death, venous thromboembolism, fetal intrauterine growth restriction, congenital abnormality, Caesarean section rates, instrumental delivery rates, postpartum sepsis, postpartum haemorrhage, and neonatal death were listed. Participants were also asked whether they considered each complication likely to be increased, decreased or remain unchanged, or if they were uncertain.

Data on exercise habits before pregnancy and during the recent 2 weeks of pregnancy were collected. Exercise pattern was defined by duration of exercise per episode, frequency of exercise per week, and intensity of exercise. Intensity was defined as the magnitude of effort required to perform an activity or exercise. Low intensity exercise was defined as no noticeable change in breathing and the ability to continue full conversation or even sing, for example, a light walk, or household chores such as vacuuming and mopping. Moderate intensity was defined as quickened breathing, but not out of breath, light sweating, and the ability to continue conversation but not sing. Examples were brisk walking and light jogging. High intensity was defined as deep and rapid breathing, the ability to talk only in short phrases, and sweating after 3 to 5 minutes, for example, running. Participants were asked to rate exercise intensity according to the Borg scale of perceived exertion. Participants were also questioned about what advice they were given regarding exercise in pregnancy.

Beliefs about safety of exercise in pregnancy were also assessed. Five exercise intensities were used for safety rating: low intensity, moderate intensity, high intensity, scuba diving, and high impact exercise. Each was subdivided into three categories according to frequency of exercise. Participants were asked to rate safety as very safe, somewhat safe, neutral, somewhat unsafe, or very unsafe.

Gestational diabetes was defined according to the WHO recommendation[14]: fasting plasma glucose level of ≥7 mmol/l or plasma 2-hour OGTT value of ≥11.1 mmol/l, or fasting plasma glucose level of <6.1 mmol/l and plasma 2-hour OGTT value of ≥7.8 but <11.1 mmol/l. Body mass index was categorised according to the WHO criteria[1]: <18.5 kg/m^2 as underweight; 18.5 to 24.9 kg/m^2 as normal weight, 25.0 to 29.9 kg/m^2 as overweight, and ≥30 kg/m^2 as obese.

Ethical Considerations and Statistical Analysis

This study was approved by the Institutional Review Board of the hospital (Ref: HKEC-2013-030). Statistical analysis was performed using PASW Statistics 18, Release Version 18.0.0 (SPSS, Inc., Chicago [IL], US). Categorical data were analysed by Chi-square and Fisher's exact tests. Continuous data with normal distribution were analysed by independent samples *t* test. Highly skewed data were analysed by Mann-Whitney *U* test. The McNemar test was used for dichotomous variables and the McNemar-Bower test was used to compare categorical variables of higher levels. A p value of <0.05 was considered statistically significant.

Results

During the study period, a total of 756 women were approached and 726 questionnaires were collected. The response rate was 96.0%. Of the questionnaires collected, 14 were incomplete and were excluded from analysis. Missing data were also subtracted from the total number as denominators to calculate the percentages.

Demographic Statistics

The mean ± standard deviation age of pregnant women in the study group was 31.6 ± 4.59 years. The median (interquartile range) gestational age at booking visit was 12.4 (12.0-13.4) weeks and at the time of study it was 28.7 (28.4-29) weeks. The mean BMI at booking visit was 21.64 ± 2.93 kg/m^2. Among the study population (i.e. 712 women), 168 (23.8%; after excluding 6 women who failed to complete OGTT) were subsequently diagnosed to have gestational diabetes mellitus. Based on the WHO criteria for BMI grouping, 553 of 705 (78.4%) women had normal weight, 77 (10.9%) were underweight, and 75 (10.6%) were overweight or obese with BMI of ≥25 kg/m^2. There were 442 (62.1%) nulliparous women. Most women (98.7%) had been educated to secondary level or above.

Weight, Obesity, and Pregnancy

Around half of pregnant women (53%; 375/705) were concerned about gaining too much weight in pregnancy. A consultation with doctors regarding weight control in pregnancy was considered the most useful source (54.4%) of information, followed by specific dietary advice (48.9%) and specific physical activity advice (33.9%).

Of those 75 overweight / obese women, about three-quarters (n=55) perceived themselves to be of normal weight during the first 3 months of pregnancy. Nonetheless, at the time of study in the third trimester, only 38 (50%) of women considered their weight normal. Overweight and obese women were more likely to consider themselves to be of normal weight, regardless of whether or not they were concerned about gaining too much weight during pregnancy. There was a significant difference between self-categorised BMI and BMI by WHO criteria (p<0.001; Table 1). Perceived change in weight between the first 3 months of pregnancy and in the third trimester (at the time of study) was also statistically significant (p<0.001; Table 2). In other words, pregnant women considered themselves heavier than they were supposed to be during pregnancy.

With regard to obesity and pregnancy (Table 3), 339 out of 708 (47.9%) women knew that obesity increases the risks in pregnancy. Overall, there was no significant difference in the knowledge of women with BMI of <25 kg/m^2 and those with BMI of ≥25 kg/m^2 (p=0.60).

Regarding knowledge of risk for specific obstetric complications, only 40 (14.1%) women knew that the risk

Table 1. Comparison of self-categorised body mass index in the first 3 months of pregnancy and that according to the WHO criteria (n=705)*

Self-categorisation of body mass index in the first 3 months of pregnancy	Body mass index according to the WHO criteria						p Value
	Underweight (n=77)		Normal weight (n=553)		Overweight / obese (n=75)		
	C	NC	C	NC	C	NC	
Underweight (n=59)	3 (15.8%)	15 (25.9%)	15 (5.0%)	24 (9.5%)	2 (3.8%)	0	<0.001
Normal (n=603)	16 (84.2%)	43 (74.1%)	263 (87.4%)	225 (89.3%)	36 (69.2%)	20 (87.0%)	
Overweight (n=31)	0	0	18 (6.0%)	2 (0.8%)	9 (17.3%)	2 (8.7%)	
Obese (n=12)	0	0	5 (1.7%)	1 (0.4%)	5 (9.6%)	1 (4.3%)	

Abbreviations: C / NC = concerned / not concerned on gaining too much weight in pregnancy; WHO = World Health Organization

* Data are shown as No. (%) and analysed by Fisher's exact test. Missing data were excluded from the calculation of percentages

Table 2. Perception of weight in the first 3 months of pregnancy and current weight at third trimester (n=701)*

Current weight	Weight in the first 3 months of pregnancy				p Value
	Underweight (n=57)	Normal (n=601)	Overweight (n=31)	Obese (n=12)	
Underweight (n=17)	8 (14.0%)	9 (1.5%)	0	0	<0.001
Normal (n=565)	45 (78.9%)	513 (85.4%)	7 (22.6%)	0	
Overweight (n=94)	4 (7.0%)	64 (10.6%)	22 (71.0%)	4 (33.3%)	
Obese (n=25)	0	15 (2.5%)	2 (6.5%)	8 (66.7%)	

* Data are shown as No. (%) and analysed by McNemar-Bowker test (Chi-square statistics=89.427). Missing data were excluded from the calculation of percentages

of all listed items was increased in obese women, even though 42.8% claimed to have received information on obesity and pregnancy. The risks associated with obesity and about which women knew least were neonatal death (22.7%), postpartum haemorrhage (21.4%), and infection after delivery (20%) [Table 3].

Exercise and Pregnancy

Those women with obstetric or medical contra-indications to exercise in pregnancy, according to the guidelines of American College of Obstetricians and Gynaecologists (ACOG[15]), were excluded. Those with previous operations were individually checked for contra-indications and subsequently included. At the time of study, 590 out of 705 (83.7%) women reported no obstetric complications, and among them, 530 (89.8%) had no medical diseases that would exclude exercise in pregnancy. They were then included in this subgroup analysis.

Expression of concern about gaining too much weight in pregnancy did not differ between those who exercised before or during pregnancy. The distribution of self-categorisation of BMI among this subgroup was similar to that of the overall study population.

With regard to knowledge about obesity and pregnancy (Table 3), those who exercised before or during pregnancy were more likely to know there were increased risks than those who did not ($p \leq 0.01$). Of the individuals in this subgroup who got all the items correct, half (n=10) exercised before and during pregnancy, and 26.4% (n=10) exercised either before or during pregnancy.

Around half of the participants (266/527, 50.5%) in this subgroup exercised before pregnancy, similar to those who exercised during the most recent 2 weeks of pregnancy (247/527, 46.9%). The exercise pattern before and during pregnancy is summarised in Table 4. There was no significant difference in BMI distribution between those who exercised before pregnancy and those who did not — significantly more overweight or obese women did not exercise before pregnancy. Also, there was no significant difference in doing exercise before or in the past 2 weeks of pregnancy between those with BMI <25 kg/m^2 and >25 kg/m^2, or any significant difference between those with and without gestational diabetes (Table 4). Those who exercised before pregnancy were more likely to have exercised in the most recent 2 weeks of pregnancy (p=0.01). Women who were nulliparous and who had a higher education level were more likely to exercise before and during their pregnancies (Table 5).

With regard to perception of weight gain during pregnancy (Table 6), a significantly higher proportion of those who did not exercise before or during pregnancy considered the maximal weight gain to be >20 kg. Nonetheless there was a significant difference in the perceived minimal weight gain among the groups with different exercise pattern.

A third of this subgroup population (n=176, 33.3%) were given advice on exercise in pregnancy. Most were advised to perform low-intensity exercise (70.5%) for 15 to 30 minutes (63.1%). The advice on frequency of exercise varied: 36.9% were advised to exercise 3 to 4 times per week and 29.5% were advised 1 to 2 times per week. Women who were given advice on exercise in pregnancy were more likely to exercise during pregnancy (p<0.001; Table 7).

Overall, among those who exercised during pregnancy, the majority (67.5%, n=179) were at a low intensity. Among women who exercised before pregnancy, only 12 (4.5%) performed the recommended moderate exercise, 30 minutes per day and more than 3 times a week during pregnancy (p=0.001; Table 7).

Table 3. Knowledge about obesity and pregnancy (n=712)*

	BMI <25 kg/m²	BMI ≥25 kg/m²	p Value	NEBP	EBP	p Value	NEDP	EDP	p Value
Knowledge about overweight / obesity and pregnancy			0.60			0.01			0.001
There are no risks (n=11)	9 (1.4)	2 (2.7)		5 (1.9)	2 (0.8)		5 (1.9)	2 (0.7)	
There may be risks (n=265)	231 (36.7)	32 (42.7)		86 (33.0)	106 (39.8)		87 (33.3)	107 (39.8)	
There are risks (n=339)	306 (48.6)	32 (42.7)		121 (46.4)	133 (50.0)		117 (44.8)	137 (50.9)	
Do not know (n=93)	84 (13.3)	9 (12.0)		49 (18.8)	25 (9.4)		52 (19.9)	23 (8.6)	
Missing data (n = 4)	Missing data (n = 7)			Missing data (n = 3)					
Birth defect			0.02			0.02			0.01
Increased risk (n=210)	191 (31.4)	19 (26.8)		63 (24.7)	89 (35.5)		59 (23.6)	94 (36.3)	
Decreased risk (n=2)	0	2 (2.8)		1 (0.4)	1 (0.4)		1 (0.4)	1 (0.4)	
No change in risk (n=219)	197 (32.4)	20 (28.2)		84 (32.9)	83 (33.1)		85 (34.0)	82 (31.7)	
Not sure (n=251)	220 (36.2)	30 (42.3)		107 (42.0)	78 (31.1)		105 (42.0)	82 (31.7)	
Missing data (n = 30)	Missing data (n = 33)			Missing data (n = 24)			Missing data (n = 21)		
Diabetes			0.21			0.02			0.02
Increased risk (n=617)	550 (88.1)	64 (87.7)		215 (84.0)	240 (92.0)		214 (83.9)	243 (91.7)	
Decreased risk (n=5)	3 (0.5)	2 (2.7)		3 (1.2)	0		3 (1.2)	0	
No change in risk (n=13)	12 (1.9)	1 (1.4)		6 (2.3)	3 (1.1)		6 (2.4)	3 (1.1)	
Not sure (n=65)	59 (9.5)	6 (8.2)		32 (12.5)	18 (6.9)		32 (12.5)	19 (7.2)	
Missing data (n = 12)	Missing data (n = 15)			Missing data (n = 13)			Missing data (n = 10)		
High blood pressure / pre-eclampsia			0.07			0.03			0.55
Increased risk (n=545)	489 (79.0)	53 (74.6)		189 (73.8)	214 (83.6)		194 (77.0)	211 (80.2)	
Decreased risk (n=4)	2 (0.3)	2 (2.8)		2 (0.8)	0		2 (0.8)	0	
No change in risk (n=24)	20 (3.2)	4 (5.6)		12 (4.7)	6 (2.3)		9 (3.6)	9 (3.4)	
Not sure (n=120)	108 (17.4)	12 (16.9)		53 (20.7)	36 (14.1)		47 (18.7)	43 (16.3)	
Missing data (n = 19)	Missing data (n = 22)			Missing data (n = 18)			Missing data (n = 15)		
Preterm labour			0.22			0.004			0.003
Increased risk (n=407)	368 (59.5)	37 (50.7)		127 (49.4)	165 (64.0)		128 (50.4)	165 (62.5)	
Decreased risk (n=0)	0	0		0	0		0	0	
No change in risk (n=83)	74 (12.0)	8 (11.0)		42 (16.3)	31 (12.0)		48 (18.9)	25 (9.5)	
Not sure (n=205)	177 (28.6)	28 (38.4)		88 (34.2)	62 (24.0)		78 (30.7)	74 (28.0)	
Missing data (n = 17)	Missing data (n = 20)			Missing data (n = 15)			Missing data (n = 12)		
Miscarriage			0.72			0.02			0.12
Increased risk (n=217)	193 (31.6)	22 (31.4)		62 (24.6)	91 (35.8)		64 (25.8)	91 (34.9)	
Decreased risk (n=4)	4 (0.7)	0		2 (0.8)	1 (0.4)		2 (0.8)	1 (0.4)	
No change in risk (n=167)	153 (25.1)	14 (20.0)		67 (26.6)	68 (26.8)		72 (29.0)	63 (24.1)	
Not sure (n=295)	260 (42.6)	34 (48.6)		121 (48.0)	94 (37.0)		110 (44.4)	106 (40.6)	
Missing data (n = 29)	Missing data (n = 32)			Missing data (n = 24)			Missing data (n = 21)		
Stillbirth			0.60			0.03			0.12
Increased risk (n=234)	211 (34.4)	22 (30.6)		70 (27.5)	95 (37.4)		70 (27.8)	96 (36.9)	
Decreased risk (n=2)	2 (0.3)	0		1 (0.4)	1 (0.4)		1 (0.4)	1 (0.4)	
No change in risk (n=156)	141 (23.0)	14 (19.4)		62 (24.3)	66 (26.0)		70 (27.8)	59 (22.7)	
Not sure (n=296)	259 (42.3)	36 (50.0)		122 (47.8)	92 (36.2)		111 (44.0)	104 (40.0)	
Missing data (n = 24)	Missing data (n = 27)			Missing data (n = 21)			Missing data (n = 18)		

Abbreviations: BMI = body mass index; EBP / NEBP = exercise / no exercise before pregnancy; EDP / NEDP = exercise / no exercise during pregnancy

* Data are shown as No. (%) and analysed by Pearson Chi-square test or Fisher's exact test

Table 3. (cont'd)

	BMI <25 kg/m²	BMI ≥25 kg/m²	p Value	NEBP	EBP	p Value	NEDP	EDP	p Value
Thrombosis			0.76			0.06			0.31
Increased risk (n=376)	337 (55.1)	37 (52.1)		129 (51.2)	154 (60.6)		128 (51.8)	156 (59.5)	
Decreased risk (n=7)	7 (1.1)	0		3 (1.2)	3 (1.2)		3 (1.2)	3 (1.1)	
No change in risk (n=55)	49 (8.0)	6 (8.5)		20 (7.9)	25 (9.8)		22 (8.9)	23 (8.8)	
Not sure (n=248)	219 (35.8)	28 (39.4)		100 (39.7)	72 (28.3)		94 (38.1)	80 (30.5)	
Missing data (n = 26)	Missing data (n = 29)			Missing data (n = 24)			Missing data (n = 21)		
Fetal growth retardation			0.48			0.14			0.22
Increased risk (n=194)	175 (28.6)	18 (25.7)		61 (24.1)	76 (30.0)		59 (23.7)	79 (30.4)	
Decreased risk (n=20)	18 (2.9)	2 (2.9)		5 (2.0)	9 (3.6)		5 (2.0)	9 (3.5)	
No change in risk (n=155)	143 (23.4)	12 (17.1)		61 (24.1)	66 (26.1)		64 (25.7)	63 (24.2)	
Not sure (n=315)	275 (45.0)	38 (54.3)		126 (49.8)	102 (40.3)		121 (48.6)	109 (41.9)	
Missing data (n = 28)	Missing data (n = 31)			Missing data (n = 24)			Missing data (n = 21)		
Caesarean delivery			1.00			0.49			0.63
Increased risk (n=482)	431 (69.5)	50 (68.5)		168 (65.6)	180 (70.0)		164 (65.1)	185 (70.1)	
Decreased risk (n=9)	8 (1.3)	1 (1.4)		3 (1.2)	2 (0.8)		3 (1.2)	2 (0.8)	
No change in risk (n=62)	55 (8.9)	7 (9.6)		26 (10.2)	29 (11.3)		28 (11.1)	28 (10.6)	
Not sure (n=143)	126 (20.3)	15 (20.5)		59 (23.0)	46 (17.9)		57 (22.6)	49 (18.6)	
Missing data (n = 16)	Missing data (n = 19)			Missing data (n = 17)			Missing data (n = 14)		
Instrumental delivery			1.00			0.06			0.47
Increased risk (n=403)	360 (58.7)	42 (59.2)		138 (54.8)	157 (61.3)		138 (55.4)	158 (60.3)	
Decreased risk (n=9)	8 (1.3)	1 (1.4)		3 (1.2)	2 (0.8)		3 (1.2)	2 (0.8)	
No change in risk (n=93)	84 (13.7)	9 (12.7)		34 (13.5)	44 (17.2)		37 (14.9)	42 (16.0)	
Not sure (n=182)	161 (26.3)	19 (26.8)		77 (30.6)	53 (20.7)		71 (28.5)	60 (22.9)	
Missing data (n = 25)	Missing data (n = 28)			Missing data (n = 22)			Missing data (n = 19)		
Infection after delivery			0.43			<0.001			0.19
Increased risk (n=137)	121 (19.8)	16 (22.5)		40 (15.7)	63 (24.7)		46 (18.3)	58 (22.2)	
Decreased risk (n=7)	7 (1.1)	0		2 (0.8)	2 (0.8)		3 (1.2)	1 (0.4)	
No change in risk (n=211)	194 (31.7)	17 (23.9)		73 (28.7)	96 (37.6)		77 (30.7)	93 (35.6)	
Not sure (n=331)	290 (47.4)	38 (53.5)		139 (54.7)	94 (36.9)		125 (49.8)	109 (41.8)	
Missing data (n = 26)	Missing data (n = 29)			Missing data (n = 21)			Missing data (n = 18)		
Bleeding after birth			0.99			<0.001			0.31
Increased risk (n=147)	131 (21.4)	15 (21.1)		44 (17.3)	61 (24.1)		46 (18.4)	60 (23.0)	
Decreased risk (n=8)	7 (1.1)	1 (1.4)		2 (0.8)	2 (0.8)		3 (1.2)	1 (0.4)	
No change in risk (n=173)	155 (25.3)	17 (23.9)		57 (22.4)	85 (33.6)		66 (26.4)	76 (29.1)	
Not sure (n=359)	320 (52.2)	38 (53.5)		152 (59.6)	105 (41.5)		135 (54.0)	124 (47.5)	
Missing data (n = 25)	Missing data (n = 28)			Missing data (n = 22)			Missing data (n = 19)		
Neonatal death			0.58			0.57			0.69
Increased risk (n=156)	142 (23.2)	14 (19.7)		57 (22.4)	60 (23.7)		54 (21.6)	64 (24.5)	
Decreased risk (n=3)	3 (0.5)	0		1 (0.4)	0		1 (0.4)	0	
No change in risk (n=146)	133 (21.7)	12 (16.9)		57 (22.4)	65 (25.7)		59 (23.6)	63 (24.1)	
Not sure (n=382)	335 (54.6)	45 (63.4)		140 (54.9)	128 (50.6)		136 (54.4)	134 (51.3)	
Missing data (n = 25)	Missing data (n = 28)			Missing data (n = 22)			Missing data (n = 19)		

Table 4. Exercise pattern before and during pregnancy*

Exercise pattern	BMI <25 kg/m² (n=466)	BMI ≥25 kg/m² (n=61)	p Value	GDM (n=134)	Non-GDM (n=393)	p Value
No exercise before and during pregnancy	180 (39%)	19 (31%)	0.53	54 (40%)	145 (37%)	0.73
No exercise before pregnancy, but exercise during pregnancy	55 (12%)	7 (12%)		14 (10%)	48 (12%)	
Exercise before and during pregnancy	180 (39%)	25 (41%)		52 (39%)	153 (39%)	
Exercise before but not during pregnancy	51 (11%)	10 (16%)		14 (10%)	47 (12%)	

Abbreviations: BMI = body mass index; GDM = gestational diabetes mellitus

* Missing data were excluded from the calculation of percentages

Table 5. Demographic characteristics and exercise pattern*

Characteristic	No exercise in the past 2 weeks	Exercise in the past 2 weeks	p Value
Parity (n=530)			0.003
No	148 (57%)	186 (69%)	
Yes	113 (43%)	83 (31%)	
Education level (n=529)			0.04
Primary or below	3 (1%)	5 (2%)	
Secondary school	143 (55%)	118 (44%)	
Tertiary or above	115 (44%)	145 (54%)	

* Categorical data were analysed by Pearson Chi-square test or Fisher's exact test

Table 6. Perceived maximal weight gain in pregnancy (n=516)*

Exercise pattern	Maximal weight gain (kg)					p Value
	0-4	5-10	11-16	17-20	>20	
No exercise before and during pregnancy	7 (3.6)	50 (25.3)	68 (34.7)	49 (25.0)	22 (11.2)	0.01
No exercise before pregnancy, but exercise during pregnancy	3 (4.8)	7 (11.3)	31 (50.0)	19 (30.6)	2 (3.2)	
Exercise before pregnancy and during pregnancy	4 (2.0)	38 (19.0)	98 (49.0)	53 (26.5)	7 (3.5)	
Exercise before but not during pregnancy	1 (1.7)	8 (13.8)	29 (50.0)	17 (29.3)	3 (5.2)	

* Data are shown as No. (%) of women. Missing data were excluded from the calculation of percentages

Among women who did exercise before pregnancy, the frequency of exercise changed during pregnancy although the duration and intensity was significantly reduced (Table 8). Median (interquartile range) rating by the Borg Scale of perceived exertion during exercise before pregnancy was 13 (11-13) and that during the past 2 weeks of pregnancy was 11 (9-13); this reduction in Borg Scale scoring was statistically significant ($p \leq 0.001$). The main reason given for not exercising during the past 2 weeks of pregnancy was 'never had a habit of doing exercise' (23.6%), followed by 'too tired' (19.2%) and 'no time' (17.2%). Moreover, 11.9% perceived that exercising in pregnancy in general might be or is unsafe.

Overall, 580/705 (82.3%) women were interested in receiving information about exercise during pregnancy. Information leaflets (46.8%) and consultation with doctors (38.9%) were the two most preferred information sources.

Table 9 illustrates the views about safety of exercise during pregnancy, in terms of intensity, frequency, as well as certain types of activities. Over 70% of pregnant women

Table 7. Exercise and pregnancy

	No exercise in the past 2 weeks	Exercise in the past 2 weeks	p Value
Advice on exercise in pregnancy (n=529)*			<0.001
No	212 (81.5%)	141 (52.4%)	
Yes	48 (18.5%)	128 (47.6%)	
Exercise before pregnancy (n=527)*			<0.001
No	199 (76.5%)	62 (23.2%)	
Yes	61 (23.5%)	205 (76.8%)	
Exercise in past 2 weeks (recommended by guidelines)			0.001
Yes	0	12 (4.5%)	
No	261 (100%)	254 (95.5%)	
Missing data (n=3)			

* Data were analysed by McNemar test

Table 8. Change in frequency, duration, and intensity of exercise among pregnant women who exercise before and during pregnancy*

	Before pregnancy				p Value
Frequency during pregnancy/week (n=198)	**<1 Time/week**	**1-2 Times/week**	**3-4 Times/week**	**>4 Times/week**	
<1 Time	15 (40.5)	8 (9.5)	3 (6.3)	0	0.14
1-2 Times	14 (37.8)	61 (72.6)	9 (18.8)	1 (3.4)	
3-4 Times	4 (10.8)	9 (10.7)	30 (62.5)	4 (13.8)	
>4 Times	4 (10.8)	6 (7.1)	6 (12.5)	24 (82.8)	
Duration during pregnancy (n=200)	**<15 Minutes**	**15-30 Minutes**	**31-60 Minutes**	**>60 Minutes**	
<15 Minutes	22 (84.6)	13 (14.3)	4 (6.5)	3 (14.3)	<0.001
15-30 Minutes	4 (15.4)	71 (78.0)	19 (30.6)	7 (33.3)	
31-60 Minutes	0	7 (7.7)	36 (58.1)	3 (14.3)	
>60 Minutes	0	0	3 (4.8)	8 (38.1)	
Intensity during pregnancy (n=201)	**Low**	**Moderate**	**High**		
Low	87 (92.6)	31 (42.5)	18 (52.9)		<0.001
Moderate	5 (5.3)	40 (54.8)	16 (47.1)		
High	2 (2.1)	2 (2.7)	0		

* Data are shown as No. (%) of women and analysed by McNemar-Bower test

considered low intensity exercise to be safe regardless of frequency. Consideration of the safety of moderate-intensity exercise decreased with increasing exercise frequency. While 69.4% of women considered moderate-intensity exercise 1 to 2 times per week to be safe, only 31% women considered it safe when the frequency increased to more than 5 times a week. In general, women regarded high-intensity exercise during pregnancy to be unsafe. Most women considered high impact exercise (95.9%) such as skiing and horse-riding, and scuba diving (92.7%) unsafe.

Discussion

Both ACOG[15] and Royal College of Obstetricians and Gynaecologists (RCOG)[5] have published guidelines about exercise in pregnancy. Both Colleges recommend 30 minutes of moderate exercise per day up to daily in the absence of obstetric and medical contra-indications. Exercise improves health and wellbeing and is considered safe and beneficial in pregnancy. A sedentary lifestyle during pregnancy contributes to excessive weight gain, frequent physical complaints, and increased risks of

Table 9. Safety of different types of exercise in pregnancy*

Item	Very safe	Somewhat safe	Neither safe or unsafe	Somewhat unsafe	Very unsafe
Low intensity					
(1-2 times per week) [n=668]	527 (78.9)	91 (13.6)	46 (6.9)	2 (0.3)	2 (0.3)
(3-5 times per week) [n=674]	402 (59.6)	176 (26.1)	80 (11.9)	14 (2.1)	2 (0.3)
(>5 times per week) [n=664]	315 (47.4)	152 (22.9)	143 (21.5)	42 (6.3)	12 (1.8)
Moderate intensity					
(1-2 times per week) [n=672]	225 (33.5)	241 (35.9)	164 (24.4)	35 (5.2)	7 (1.0)
(3-5 times per week) [n=666]	97 (14.6)	232 (34.8)	235 (35.3)	91 (13.7)	11 (1.7)
(>5 times per week) [n=653]	41 (6.3)	161 (24.7)	275 (42.1)	138 (21.1)	38 (5.8)
High intensity					
(1-2 times per week) [n=679]	26 (3.8)	78 (11.5)	189 (27.8)	242 (35.6)	144 (21.2)
(3-5 times per week) [n=654]	5 (0.8)	26 (4.0)	148 (22.6)	276 (42.2)	199 (30.4)
(>5 times per week) [n=656]	4 (0.6)	16 (2.4)	107 (16.3)	262 (39.9)	267 (40.7)
Scuba diving (n=679)	3 (0.4)	9 (1.3)	38 (5.6)	141 (20.8)	488 (71.9)
High impact exercise (e.g. skiing, horse-riding) [n=678]	2 (0.3)	3 (0.4)	23 (3.4)	46 (6.8)	604 (89.1)

* Data are shown as No. (%) of women

gestational diabetes and pre-eclampsia. Exercise benefited pregnant women both physically and psychologically. Common complaints in pregnancy such as fatigue and varicosities were reduced. Active women experienced less insomnia, stress, anxiety, or depression. Weight-bearing exercise reduced the length of labour and lessened delivery complications[16-19].

Our study population had a similar age distribution to the general obstetric population and compared with the Hong Kong Territory-wide Audit in 2004[20]. A previous study[4] estimated the prevalence of pregnant women with a BMI of ≥25 kg/m^2 at booking visit to be 16.8%: the prevalence in our study was 10.5%. We performed our study at the time of routine OGTT in pregnancy, around 28 weeks. A small proportion of women with risk factors such as obesity and a history of gestational diabetes had already undergone OGTT at 16 to 18 weeks. Those who were diagnosed at this time to have gestational diabetes did not undergo the 28-week gestation OGTT. This might have contributed to the slightly lower incidence of women with BMI of ≥25 kg/m^2 in this study population, although the number of women who did not undergo 28-week OGTT was small.

The prevalence of gestational diabetes in our study was 23.8%, much higher than the reported 6.3% in the 2004 Territory-wide Audit[20]. Although this may be due to differences in diagnostic criteria, there has been a notable increase in the incidence of gestational diabetes in more recent years. Previous audit revealed that the incidence doubled between 1994 and 2004[20]. Leung et al[4] determined that 22.9% and 15.2% of women with BMI of ≥30 kg/m^2 and BMI between ≥25 and <27 kg/m^2 had gestational diabetes, respectively. Furthermore, universal screening is likely to detect more women with gestational diabetes in the low-risk population. The prevalence of gestational diabetes in our unit was 25.8%[21]. Although our study showed no significant difference in exercise pattern between those with and without gestational diabetes, it demonstrates that the prevalence of gestational diabetes may be greater than previous statistics. This further emphasises the need to raise awareness of gestational diabetes that is more common in obese pregnant women[22].

Just over 50% of women were concerned about gaining too much weight in pregnancy. Our study revealed that they generally perceived themselves to be heavier than they were supposed to be at the time of study. This might reflect their false perception of gaining too much weight during the course of pregnancy, although this might not be a concern to the pregnant women themselves. Contrary to this, overweight women were more likely to consider themselves to be normal in weight; this reflects a need for

better education about weight change during pregnancy.

Current public health education emphasises the association of obesity with hypertension and diabetes in the general population and therefore, not surprisingly, more than 75% of women in our study were aware that obesity increases the risk of hypertension and diabetes in pregnancy. A study in the US revealed that only a small proportion of pregnant women were counselled about the risks associated with obesity[23]. While 42.8% of women in our study claimed to have received information on risks related to obesity in pregnancy, only 14.1% knew about the increased risk for all listed items. Knowledge of specific obesity-associated obstetric complications, such as neonatal death, postpartum haemorrhage, and infection after delivery was poor. These results indicate a need for enhanced public education about the adverse effects of obesity in pregnancy specifically.

The Institute of Medicine and the National Research Council in the US has issued guidelines for gestational weight gain[9], whereby women who are underweight, normal weight, overweight, or obese should gain 12.5 to 18 kg, 11.5 to 16 kg, 7 to 11.5 kg and 5 to 9 kg, respectively. Those who did not exercise before and during pregnancy are clearly the target group of higher priority for education and intervention, especially when they perceive exercise weight gain as appropriate.

Exercise pattern in the 2 weeks prior to the study was used to indicate exercise pattern in pregnancy. This assumption was valid according to a prospective cohort in the UK[24]. In that study, the prevalence of physical activity, with sweating for 3 hours or more a week, was similar at 18 weeks and 32 weeks of gestation. Although 46.9% of pregnant women exercised during pregnancy in our study, only 4.5% exercised at the recommended level. In contrast, the prevalence was higher than other overseas studies (15.8% in the US[7], 48.8% in the UK[25], and 21.5% in Ireland[8]). Women who habitually exercised before pregnancy and who had not delivered previously were more likely to exercise during pregnancy. Women with higher education level were likely to be more health conscious and aware of the benefits and safety of exercise — these findings have also been illustrated in other studies[25,26] Demographic characteristics should be taken into consideration when distributing realistic advice about exercise in pregnancy.

Our study shows that the availability of advice about exercise significantly altered the attitudes to exercising in pregnancy: women who were given advice were more likely to exercise. Nonetheless despite the recommendation for moderate exercise 30 minutes per day, more than 3 times a week for previously active women, they were commonly advised to perform only low-intensity exercise for 15 to 30 minutes. Irrespective of their health status, most (82.3%) women were eager to receive information about physical activities and exercising in pregnancy. The perceived most effective sources of information were information leaflets, specific advice on physical activity, and consultation with doctors during antenatal visits. This illustrates the important role of health care professionals in encouraging exercise and physical activity during pregnancy, and in being proactive in disseminating appropriate advice. Although exercise alone does not prevent excessive weight gain or obesity in pregnancy, it has been shown that physically active women are more likely to continue exercising after delivery. This was, in general, an important public health issue in weight management.

It is not surprising to find that pregnant women who did not exercise before pregnancy did not exercise during pregnancy either. Nonetheless, sedentary women were advised to commence exercising for 15 minutes, 3 times a week, increasing gradually to 30-minute sessions, 4 times a week[5].

Our study examined the exercise pattern at two time-points, pre-pregnancy and at around 28 weeks of gestation. Although we did not examine when women started exercising during pregnancy or demonstrate the change in exercise patterns across gestations, our study does illustrate that exercise duration and intensity are significantly lower during pregnancy than before.

Among women who did not exercise in pregnancy, 11.9% perceived that exercising in pregnancy in general might be or is unsafe. Over 70% of pregnant women considered low-intensity exercise to be safe regardless of frequency. In contrast, the perception of safety of moderate-intensity exercise decreased with increasing frequency. This shows that safety is one of the perceived barriers to exercising during pregnancy.

Further study of the perceived benefits of exercise may provide insight into the potential motivation to exercise during pregnancy. Views of health care professionals on exercise in pregnancy may also be explored. This may provide guidance on effective means of information dissemination and can also improve antenatal counselling as well as general public health education.

Conclusion

In this study, overweight women generally perceived their weight to be normal and an awareness of the pregnancy complications associated with obesity was generally lacking. Although about half of the study pregnant women exercised during pregnancy, only a small proportion exercised at the recommended level. Public education to enhance awareness of obesity and its associated risks in pregnancy is needed. Promotion of exercise among pregnant women is beneficial.

References

1. WHO/IASO/IOTF. The Asia-Pacific perspective: redefining obesity and its treatment. Melbourne: Health Communications Australia; 2000.
2. Ko GT, Tang JS, Chan JC. Worsening trend of central obesity despite stable or declining body mass index in Hong Kong Chinese between 1996 and 2005. *Eur J Clin Nutr* 2010; 64:549-52.
3. Yu CK, Teoh TG, Robinson S. Obesity in pregnancy. *BJOG* 2006; 113:1117-25.
4. Leung TY, Leung TN, Sahota DS, et al. Trends in maternal obesity and associated risks of adverse pregnancy outcomes in a population of Chinese women. *BJOG* 2008; 115:1529-37.
5. Royal College of Obstetricians and Gynaecologists. Exercise in pregnancy. RCOG statement No. 4; Jan 2006.
6. Measuring physical activity intensity. Centers for Disease Control and Prevention. Available from: http://www.cdc.gov/physicalactivity/everyone/measuring/index.html. Accessed 22 Apr 2015.
7. Evenson KR, Savitz DA, Huston SL. Leisure-time physical activity among pregnant women in the US. *Paediatr Perinat Epidemiol* 2004; 18:400-7.
8. Walsh JM, McGowan C, Byrne J, McAuliffe FM. Prevalence of physical activity among healthy pregnant women in Ireland. *Int J Gynaecol Obstet* 2011; 114:154-5.
9. Rasmussen KM, Abrams B, Bodnar LM, Butte NF, Catalano PM, Maria Siega-Riz A. Recommendations for weight gain during pregnancy in the context of obesity epidemic. *Obstet Gynecol* 2010; 116:1191-5.
10. Heslehurst N, Rankin J, Wilkinson JR, Summerbell CD. A nationally representative study of maternal obesity in England, UK: trends in incidence and demographic inequalities in 619 323 births, 1989-2007. *Int J Obes (Lond)* 2010; 34:420-8.
11. Bastian LA, West NA, Corcoran C, Munger RG; Cache County Study on Memory, Health, and Aging. Number of children and the risk of obesity in older women. *Prev Med* 2005; 40:99-104.
12. Fraser A, Tilling K, Macdonald-Wallis C, et al. Association of maternal weight gain in pregnancy with offspring obesity and metabolic and vascular traits in childhood. *Circulation* 2010; 121:2557-64.
13. Johnson M, Campbell F, Messina J, Preston L, Buckley Woods H, Goyder E. Weight management during pregnancy: a systematic review of qualitative evidence. *Midwifery* 2013; 29:1287-96.
14. Alberti KG, Zimmet PZ. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus provisional report of a WHO consultation. *Diabet Med* 1998; 15:539-53.
15. American College of Obstetricians and Gynaecologists. Exercise during pregnancy and the postpartum period. ACOG committee opinion Number 257; Jan 2002 (reaffirmed 2009).
16. Zhang J, Savitz DA. Exercise during pregnancy among US women. *Ann Epidemiol* 1996; 6:53-9.
17. Sternfeld B. Physical activity and pregnancy outcome. Review and recommendations. *Sports Med* 1997; 23:33-47.
18. Wolfe LA, Hall P, Webb KA, Goodman L, Monga M, McGrath MJ. Prescription of aerobic exercise during pregnancy. *Sports Med* 1989; 8:273-301.
19. Nascimento SL, Surita FG, Cecatti JG. Physical exercise during pregnancy: a systematic review. *Curr Opin Obstet Gynaecol* 2012; 24:387-94.
20. The Hong Kong College of Obstetricians and Gynaecologists. Territory-wide Obstetrics and Gynaecology Audit, 2004.
21. Department of Obstetrics and Gynaecology, Pamela Youde Nethersole Eastern Hospital, Hong Kong. Annual Obstetrics Statistics Report, 2013.
22. National Collaborating Centre for Women's and Children's Health (UK). NICE Clinical Guidelines, No. 63: Diabetes in pregnancy. London: RCOG Press; Mar 2008 (reissued Jul 2008).
23. Kominiarek MA, Vonderheid S, Endres LK. Maternal obesity: do patients understand the risks? *J Perinatol* 2010; 30:452-8.
24. Liu J, Blair SN, Teng Y, Ness AR, Lawlor DA, Riddoch C. Physical activity during pregnancy in a prospective cohort of British women: results from the Avon longitudinal study of parents and children. *Eur J Epidemiol* 2011; 26:237-47.
25. Mudd LM, Nechuta S, Pivarnik JM, Paneth N; Michigan Alliance for National Children's Study. Factors associated with women's perceptions of physical activity safety during pregnancy. *Prev Med* 2009; 49:194-9.
26. Gaston A, Cramp A. Exercise during pregnancy: a review of patterns and determinants. *J Sci Med Sport* 2011; 14:299-305.

Appendix. Questionnaire for this study

臨床調查同意書

臨床調查之題目：香港孕婦對於懷孕期間體重和運動的看法

主要調查者：東區尤德夫人那打素醫院婦產科駐院醫生羅欣珮醫生

聯絡電話：2595 6111

這項調查是本人在本院婦產科的覆診孕婦中進行的一項問卷調查。

這項問卷需時約5分鐘，而且是全自願性質的。您可隨時終止參與。終止參與不會影響您現有或日後接受的醫療護理服務。

這調查的目的是調查香港孕婦對懷孕期間的體重、體重增加和運動各方面的意見。

本調查希望提升孕婦對懷孕期間體重之重要性的認知，以及院方於將來之資源分配，及提供有關上述主題的資訊予孕婦時作參考之用。

如果你曾經填寫過這份問卷，請不用再次填寫。

私隱保障：你所填寫的資料將被視為機密，只有主要調查者及指定東區尤德夫人那打素醫院婦產科負責人員才可檢視你的資料。這份問卷所收集的個人資料將會於完成研究五年後被銷毀。

如果你同意參與這項問卷調查，請簽署及完成所附問卷，以及保留這頁同意書作參考。

多謝你的參與

參與者簽署：

日期：

Appendix. (cont'd)

東區尤德夫人那打素醫院婦產科
臨床調查：香港孕婦對於懷孕期間體重和運動的看法

Official use only
Gestation at OGTT: _____
Weight at OGTT: _____ (kg)

Label

Gestation at first visit: _____
Height: _____ (cm)
Weight at FIRST visit: _____ (kg)
BMI at FIRST visit: _____

Addition notes: _____

請✓適當的方格

背景資料

1. **您有沒有生過小孩子?**
   - ☐ 沒有—請到第2題
   - ☐ 有:
     - (a) 多少個? _____
     - (b) 對上一次生小孩子是什麼時候? (月份/年份) _____
     - (c) 對上一次分娩週數是: 懷孕 _____ 週
     - (d) 上一次生小孩子和這次懷孕之間, 您的體重:
       - ☐ 返回到上一次懷孕前的體重
       - ☐ 增加了1-3公斤
       - ☐ 增加了3-5公斤
       - ☐ 增加了多於 5公斤
       - ☐ 不清楚
       - ☐ 比上一次懷孕前的體重減輕了
2. **教育程度**
   - ☐ 小學
   - ☐ 中學
   - ☐ 大學/大專或以上
3. **職業**
   - ☐ 文職/秘書
   - ☐ 教育專業人士/老師
   - ☐ 行政人員
   - ☐ 學生
   - ☐ 商業/會計/建築師/律師
   - ☐ 家庭主婦
   - ☐ 飲食/美容/其他服務行業
   - ☐ 醫護人員
   - ☐ I.T./廣告電視行業
   - ☐ 其他，請列明: _____

Appendix. (cont'd)

4. **請問您有沒有以下病歷?**
   - ☐ 糖尿病（不包括妊娠糖尿病）
   - ☐ 高血壓
   - ☐ 心臟病，請列明: _____
   - ☐ 哮喘/呼吸系統疾病，請列明: _____
   - ☐ 自體免疫性疾病，請列明: _____
   - ☐ 肌肉與骨骼的疾病，請列明: _____
   - ☐ 接受手術：(不包括剖腹產子)
     請列明: _____
   - ☐ 其他，請列明: _____
   - ☐ 沒有以上情況

5. **您有沒有吸煙的習慣?** 有 ☐ 沒有 ☐ 已戒煙 ☐
   如有，你每天抽多少支煙: _____

6. **您有沒有喝酒的習慣?** 有 ☐ 沒有 ☐ 已戒酒 ☐
   如有，你每天喝多少? _____

7. **您有沒有濫用藥物?** 有 ☐ 沒有 ☐ 已戒 ☐
   如有：(a) 哪種藥物? _____
   (b) 多久一次? 1個月 _____次

8. **家庭每月收入**
   - ☐ <$10,000
   - ☐ >$10,000-30,000
   - ☐ >$30,000-50,000
   - ☐ >$50,000

9. **到目前為止，您懷孕期間 曾否有以下情況?**
   - ☐ 持續陰道出血
   - ☐ 低位胎盤
   - ☐ 多胎妊娠
   - ☐ 穿羊水/羊水過少
   - ☐ 先兆早產
   - ☐ 胎兒生長遲緩
   - ☐ 沒有以上情況

關於體重和懷孕期間的體重增長

10. **您曾否接收或閱讀有關懷孕期間過重/肥胖的資訊?**
    - ☐ 沒有
    - ☐ 有 →資訊來源:
      - ☐ 醫護人員
      - ☐ 互聯網
      - ☐ 資訊單張
      - ☐ 講座
      - ☐ 其他, 請列明: _____

11. **您認為:**
    (a) 您懷孕首3個月的體重是：
    - ☐ 過輕
    - ☐ 正常
    - ☐ 過重
    - ☐ 肥胖

    (b) 您現時的體重是：
    - ☐ 過輕
    - ☐ 正常
    - ☐ 過重
    - ☐ 肥胖

Appendix. (cont'd)

12. 您認為在整個懷孕期間, 您的體重應該:

(a) 最少增長多少?

☐ 0-4公斤
☐ 5-10公斤
☐ 11-16公斤
☐ 17-20公斤
☐ >20公斤

(b) 最多增長多少?

☐ 0-4公斤
☐ 5-10公斤
☐ 11-16公斤
☐ 17-20公斤
☐ >20公斤

13. 您曾否擔心懷孕期間體重增長過多?

☐ 擔心
☐ 不擔心

14. 您認為以下哪項最能夠協助您在懷孕期間維持理想體重? (可選多項)

☐ 資訊單張
☐ 關於妊娠期的飲食講座
☐ 關於妊娠期的運動講座
☐ 產前檢查期間與醫生討論
☐ 互聯網/電郵
☐ 其他，請列明: _____

<u>關於過重 / 肥胖和懷孕的認知</u>

15. 孕婦如有肥胖的情況：

☐ 不會增加懷孕風險
☐ 可能增加懷孕風險
☐ 會增加懷孕風險
☐ 我不知道會否增加懷孕風險

16. 懷孕期間, 肥胖和以下情況有什麼的關係?

請✓適當的方格

	增加風險	減少風險	沒有關係	不知道
(a) 嬰兒先天缺陷	☐	☐	☐	☐
(b) 糖尿病	☐	☐	☐	☐
(c) 血壓高/先兆子癇	☐	☐	☐	☐
(d) 早產	☐	☐	☐	☐
(e) 小產	☐	☐	☐	☐
(f) 胎死腹中	☐	☐	☐	☐
(g) 血管栓塞	☐	☐	☐	☐
(h) 胎兒生長遲緩	☐	☐	☐	☐
(i) 需要剖腹生產	☐	☐	☐	☐
(j) 需要助產	☐	☐	☐	☐
(k) 產後感染	☐	☐	☐	☐
(l) 產後出血	☐	☐	☐	☐
(m) 新生兒死亡	☐	☐	☐	☐

Appendix. (cont'd)

關於運動與妊娠

運動的強度可以分為3個程度:

- 輕度運動：運動時呼吸沒有明顯變化，可以如常的交談，甚至唱歌，例如：散步，做家務（如吸塵，拖地）
- 中度運動：運動時呼吸加快，輕微出汗，可以交談，但不能唱歌，如急步行走，慢步跑
- 強度運動：運動時-呼吸急促，只能說短語，3-5分鐘內已出汗，如快步跑

17. 產前檢查以來，您曾否接收或閱讀有關懷孕期間運動的建議?

☐ 沒有 -> 請到第18題

☐ 有 -> 得到的建議是：

(a) 運動的頻率 / 次數：

☐ 少於一星期一次
☐ 一星期一至兩次
☐ 一星期三至四次
☐ 多於一星期四次
☐ 沒有提及

(b) 每次運動的時間：

☐ <15分鐘
☐ 15-30分鐘
☐ 31-60分鐘
☐ 多於60分鐘
☐ 沒有提及

(c) 運動的強度：

☐ 輕度運動：運動時呼吸沒有明顯變化，可以如常的交談，甚至唱歌，例如：散步，做家務（如吸塵，拖地）
☐ 中度運動：運動時呼吸加快，輕微出汗，可以交談，但不能唱歌，如急步行走，慢步跑
☐ 強度運動：運動時呼吸急促，只能說短語，3-5分鐘內已出汗，如快步跑
☐ 沒有提及

18. 您會否想知道更多關於運動與妊娠的資訊?

☐ 不會 -> 請到第19題

☐ 會，以什麼形式?(可選最多3項)

☐ 資訊單張
☐ 關於妊娠期的飲食講座
☐ 關於妊娠期的運動講座
☐ 產前檢查期間與醫生討論
☐ 互聯網/電郵
☐ 其他，請列明: _____

Appendix. (cont'd)

19. **在這次懷孕前，您有沒有運動的習慣?**
    - ☐ 沒有 -> 請到第20題
    - ☐ 有 -> 如有：
      - (a) 運動的頻率/次數：
        - ☐ 少於一星期一次
        - ☐ 一星期一至兩次
        - ☐ 一星期三至四次
        - ☐ 多於一星期四次
      - (b) 每次運動的時間：
        - ☐ <15分鐘
        - ☐ 15-30分鐘
        - ☐ 31-60分鐘
        - ☐ 多於60分鐘
      - (c) 運動的強度:
        - ☐ 輕度運動：運動時呼吸沒有明顯變化，可以如常的交談，甚至唱歌，例如: 散步，做家務（如吸塵，拖地）
        - ☐ 中度運動：運動時呼吸加快，輕微出汗，可以交談，但不能唱歌，如急步行走，慢步跑
        - ☐ 強度運動：運動時呼吸急促，只能說短語，3-5分鐘內已出汗，如快步跑
20. **在過去兩星期間，您有沒有做運動?**
    - ☐ 沒有 -> 請到第21題
    - ☐ 有 -> 請到第22題
21. **在過去兩星期間沒有做運動的原因是 (可選多項)：**
    - ☐ 沒有做運動的習慣
    - ☐ 不喜歡做運動
    - ☐ 過於勞累
    - ☐ 身體不適
    - ☐ 沒有時間
    - ☐ 認為懷孕期間做運動不安全
    - ☐ 不清楚懷孕期間做運動是否安全
    - ☐ 醫護人員建議不應做運動
    - ☐ 家人和朋友建議不應做運動
    - ☐ 其他，請列明：_____

→請到第23題

22. **在過去兩星期間，您做運動的**
    - (a) 頻率 / 次數：
      - ☐ 少於一星期一次
      - ☐ 一星期一至兩次
      - ☐ 一星期三至四次
      - ☐ 多於一星期四次
    - (b) 每次運動的時間：
      - ☐ <15分鐘
      - ☐ 15-30分鐘
      - ☐ 31-60分鐘
      - ☐ 多於60分鐘
    - (c) 運動的強度
      - ☐ 輕度運動：運動時呼吸沒有明顯變化，可以如常的交談，甚至唱歌，例如：散步，做家務（如吸塵，拖地）
      - ☐ 中度運動：運動時呼吸加快，輕微出汗，可以交談，但不能唱歌，如急步行走，慢步跑
      - ☐ 強度運動：運動時呼吸急促，只能說短語，3-5分鐘內已出汗，如快步跑

Appendix. (cont'd)

23. 運動的強度

另一個量度或決定運動時強度的方法，就是採用由瑞典心理學家 Gunnar Borg（1970，1985，1994，1998）發展出來的〈感覺盡力程度評級表〉。< Rate of Perceived Exertion >(RPE) 評級表讓參與者藉著運動時的自身感覺（心跳、呼吸、排汗、肌肉疲勞等），來估計運動時的強度。評級表的數值範圍是由 6 至 20（見下表）。

6 是指“完全沒有用力的感覺”，而20是指“竭盡能力，必須停止”。

評級	評級描述	例子
6	完全沒有用力的感覺	
7	極之輕鬆	
8		
9	非常輕鬆	按自己的步調慢慢走
10		
11	輕鬆	
12		
13	有點辛苦	可以繼續
14		
15	辛苦	
16		
17	非常辛苦	非常費勁，需要很努力才可繼續
18		
19	極之辛苦	對於大多數人來說，這是他們曾經做過的最劇烈的運動
20	竭盡能力	虛脫，必須停止

如果以以上的評級來描述您的運動的強度, 您會怎樣評級:

i. 您在這次懷孕前每次運動的強度：_____

(如果你懷孕前沒有做運動，請不用填寫，請到第24題)

ii. 您在過去兩星期間每次運動的強度：_____

(如果你過去兩星期間沒有做運動，請不用填寫，請到第24題)

關於在懷孕期間運動的安全

24. 您對懷孕期間運動的安全性的看法

運動的頻率/強度	非常安全	偏於安全	中立	偏於不安全	非常不安全
(a) 輕度運動					
(i) 一星期1至2次	□	□	□	□	□
(ii) 一星期3至5次	□	□	□	□	□
(iii) 一星期多於5次	□	□	□	□	□
(b) 中度運動					
(i) 一星期1至2次	□	□	□	□	□
(ii) 一星期3至5次	□	□	□	□	□
(iii) 一星期多於5次	□	□	□	□	□
(c) 強度運動					
(i) 一星期1至2次	□	□	□	□	□
(ii) 一星期3至5次	□	□	□	□	□
(iii) 一星期多於5次	□	□	□	□	□
(d) 潛水	□	□	□	□	□
(e) 高衝擊力的運動，例如騎馬，滑雪	□	□	□	□	□

輕度運動：運動時呼吸沒有明顯變化，可以如常的交談，甚至唱歌，例如：散步，做家務（如吸塵，拖地）

中度運動：運動時呼吸加快，輕微出汗，可以交談，但不能唱歌，如急步行走，慢步跑

強度運動：運動時呼吸急促，只能說短語，3-5分鐘內已出汗，如快步跑

謝謝您的參與