

# Exploring the Barriers to Resistance Exercise among Hong Kong Women

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**Abstract** Regular resistance exercise has been shown to have numerous benefits such as healthy aging, and delaying or preventing chronic illnesses. However, evidence shows women's participation in physical activity and resistance exercise is low. The lack of visibility is especially problematic for women who face multiple sources of disadvantage, such as ageing, frailty, less muscle. More is that women live longer and thus early prevention and be proactive to minimize burden to the society is essential. This study, which was the first done locally, aimed to explore the potential barriers to their engagement in resistance exercise. A cross sectional survey was conducted on a sample of 366 Hong Kong women. The findings showed that a majority of them did not regularly participate in any form of resistance exercise. Their low participation rates were due to limited knowledge on resistance exercise, lack of community resources, lack of companions, no time, and feeling tired after long working hours. Our study demonstrated a significant negative relationship between their hours of work per day and participation rates in doing the exercise. This research highlights the importance of promoting resistance exercise to women to improve their participation rates so as to enable them to enjoy healthier life thereby minimizing hospitalization and institutionalization. If successful, this can help reduce social and economic costs to Hong Kong.

**Keywords:** *resistance exercise, barriers, ageing women, frailty, less muscle, early prevention*

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## 1. Introduction

Resistance exercise is a form of physical activity that is designed to improve muscular fitness by exercising a muscle or a group of muscles against external resistance. It was shown to promote substantial health-related benefits such as improved muscle strength and endurance, reduced occurrence of fall, and enhanced quality of life [1,2,3,4,5,6]. In addition, resistance exercise is particularly important to women because they lose their bone mass more quickly after menopause [7]. Despite all these benefits, physical inactivity is a global challenge [8,9,10]. Over half (55.4%) of the Hong Kong population aged from 18 to 64 had not done any vigorous physical activity of at least 10 minutes a day in the seven days prior to a survey commissioned by the Department of Health [11]. In the survey, it was found that people only spent on average 12.4 minutes a day on vigorous physical activities.

People are found to be less than willing to participate in exercise. In particular, women are less physically active than men. Less women (13.3%) took part in doing vigorous physical activities of at least 10 minutes a day for the number of days surveyed. Recent statistics showed that more than half (52.9%) of the women had at least one chronic disease, which posed a threat to the healthcare

system [12]. To mitigate this threat, there is an urgent need to expand women's opportunities to live healthily and enhance their quality of life [13] through exercise.

From another perspective, women from different cultures have different views on the ideal body. Most women, if not all, regarded thin or slim bodies with sloped shoulders as an ideal body shape in Asian countries [14], while many women in the West preferred fitness, and thinness [15,16]. Indeed, women were not satisfied with their body shape even though only 13.2% of them were overweight and about 75% of them had normal BMI, and yet they still desired to have a slimmer body [17,18,19]. In addition, there were some social norms regarding gender characteristics that might have impeded women from sustained engagement in resistance exercise. Women feared to have muscular bodies and considered resistance exercise too masculine a sport [15]. Brace-Govan (2004) interviewed sixteen women weightlifters and they revealed that they had diverse opinions about physical exercise in comparison with those who opposed such exercise [20]. These conflicting opinions were caused by different aesthetic standards of men and women. Another study interviewed eight women and stated the standards of beauty and perfection, presuming women should be petite [21]. These phenomena seemed to have dampened women's drive to access and pursue resistance training, resulting in their low participation rates and affects their

health behaviour. Although their perceived barriers to resistance exercise have been studied overseas, studies specifically addressing Asian women's needs have not been conducted. To change one's health behavior, Stages of Change were explored widely in the past decades [22,23,24,25,26]. The Stages of Change is a widely used model for health intervention related to behavioral change [27,28]. There are five stages of change, namely, pre-contemplation, contemplation, preparation, action, and maintenance. Each stage is considerably different from the others and one would see them as a continuum of behavioral change.

To this end, the team explored the perceived barriers from Stages of Change perspective among community-living women towards resistance exercise. It was anticipated that this would shed likes on identifying suitable strategies on changes of health behaviour.

## 2. Method

This was a cross-sectional study. Female subjects aged 18 to 64 were recruited by convenience. Demographic data including age, marital status, educational level, and working hours per week were collected to better understand whether these factors would become a hindrance to their participation in resistance exercise. The study was approved by the Ethical Committee of Tung Wah College and the Committee on the Use of Human and Animal Subjects in Teaching and Research (HASC). The participation of the subjects was on a voluntary basis, with their written consent obtained after information of the study was explained to them on a face-to-face basis.

Perceived barriers were explored by questionnaires. There were 4 parts in the questionnaire. Part 1 (4 items) was the stage of change in resistance exercise. It was modified from "Physical Activity Stage of Change Questionnaire" (PAR-Q) [29]. Part 2 (11 items) testing their knowledge on resistance exercise. Part 3 (21 items) was the barrier to resistance exercise, modified from Exercise Benefits/Barriers Scale (EBBS). Subjects were asked to

rate on a 4-point scale with "strongly agree", "agree", "disagree" and "strongly disagree". Part 4 was the demographic data, which include age, educational level, family structure, working hours and income and poverty status.

An experienced registered nurse and a physiotherapist were invited in the content validation was invited to evaluate its content validity, whereas five people were invited to test its test-retest reliability. Both its content validity and test-retest reliability were affirmed. A pilot study was then carried out with twenty participants to ascertain the instrument's level of validity. The Cronbach's Alpha coefficient was 0.74, indicating that the important items in the questionnaire were consistent internally. Moreover, test-retest reliability was used to measure the stability of the instrument. The intra-class correlation coefficient was 0.984. Inter-rater reliability was also tested to confirm that raters reached similar results.

## 3. Results

### 3.1. The Stage of Change

A total of 366 subjects participated in the study. Table 1 shows the demographic data of the participants and their stages of change. There were 209 (57.1%) participants at the pre-contemplation stage as they were inactive in doing any resistance exercise. Four (1.1%) participants were in the action stage as they were doing resistance exercise at the recommended level, but for less than six months. Fifty-five (15%) participants were at the maintenance stage as they were doing resistance exercise at the recommended level for over six months. Chi-square test was used to analyze the relationship between the stages of change in doing resistance exercise and the demographic data. The results show in Table 2 indicated a significant relationship only between the working hours and stages of change ( $p=0.027$ ). However, the stages of change were not significantly related to age ( $p=0.458$ ), education ( $p=0.072$ ), marital status ( $p=0.399$ ), number of children ( $p=0.639$ ), or income ( $p=0.294$ ).

Table 1. Participants' demographics and various stages of change (n=366)

Variables	n	Pre-contemplation n (%)	Contemplation n (%)	Preparation n (%)	Action n (%)	Maintenance n (%)
Age						
18-22	78	44 (56.4)	15 (19.2)	6 (7.7)	2 (2.6)	11 (14.1)
23-27	52	28 (53.8)	8 (15.4)	9 (17.3)	0 (0)	7 (13.5)
28-32	24	9 (37.5)	6 (25.0)	3 (12.5)	0 (0)	6 (25.0)
33-37	22	11 (50.0)	6 (27.3)	1 (4.5)	0 (0)	4 (18.2)
38-42	38	24 (63.2)	10 (26.3)	2 (5.3)	0 (0)	2 (5.3)
43-47	45	26 (57.8)	9 (20.0)	4 (8.9)	1 (2.2)	5 (11.1)
48-52	28	15 (53.6)	6 (21.4)	3 (10.7)	1 (3.6)	3 (10.7)
53-57	27	16 (59.3)	2 (7.4)	3 (11.1)	0 (0)	6 (22.2)
58-62	41	28 (68.3)	5 (12.2)	0 (0)	0 (0)	8 (19.5)
63-64	11	8 (72.7)	0 (0)	0 (0)	0 (0)	3 (27.3)
Education						
No education	10	6 (60)	0 (0)	0 (0)	1 (10.0)	3 (30.0)
Primary level	26	16 (61.5)	4 (15.4)	2 (7.7)	0 (0)	4 (15.4)
Secondary level	127	81 (63.8)	25 (19.7)	8 (6.3)	0 (0)	13 (10.2)
Tertiary level or above	203	106 (52.2)	38 (18.7)	21 (10.3)	3 (1.5)	35 (17.2)
Marital Status						
Single	188	102 (54.3)	34 (18.1)	20 (10.6)	2 (1.1)	30 (16.0)
Married	159	99 (62.3)	28 (17.6)	11 (6.9)	2 (1.3)	19 (11.9)
Divorced	17	7 (41.2)	4 (23.5)	0 (0)	0 (0)	6 (35.3)
Widowed	2	1 (50.0)	1 (50.0)	0 (0)	0 (0)	0 (0)

Variables	n	Pre-contemplation n (%)	Contemplation n (%)	Preparation n (%)	Action n (%)	Maintenance n (%)
Number of children						
No children	221	118 (53.4)	41 (18.6)	23 (10.4)	2 (0.9)	37 (16.7)
1-2	116	71 (61.2)	20 (17.2)	8 (6.9)	2 (1.7)	15 (12.9)
3-4	25	16 (64.0)	6 (24.0)	0 (0)	0 (0)	3 (12.0)
5 or above	4	4 (100.0)	0 (0)	0 (0)	0 (0)	0 (0)
Working Hours						
<19	110	67 (60.9)	20 (18.2)	9 (8.2)	2 (1.8)	12 (10.9)
19-40	59	28 (47.5)	11 (18.6)	2 (3.4)	2 (3.4)	16 (27.1)
40-44	118	63 (53.4)	27 (22.9)	14 (11.9)	0 (0)	14 (11.9)
45-49	61	43 (70.5)	7 (11.5)	3 (4.9)	0 (0)	8 (13.1)
>49	18	8 (44.4)	2 (11.1)	3 (16.7)	0 (0)	5 (27.8)
Income						
\$0-\$4,999	118	72 (61.0)	20 (16.9)	9 (7.6)	2 (1.7)	15 (12.7)
\$5,000-\$9,999	54	26 (48.1)	17 (31.5)	3 (5.6)	0 (0)	8 (14.8)
\$10,000-\$14,999	73	41 (56.2)	14 (19.2)	6 (8.2)	0 (0)	12 (16.4)
\$15,000-\$19,999	56	31 (55.4)	5 (8.9)	8 (14.3)	0 (0)	12 (21.4)
\$20,000-\$24,999	30	16 (53.3)	8 (26.7)	2 (6.7)	1 (3.3)	3 (10.0)
\$25,000 or above	35	23 (65.7)	3 (8.6)	3 (8.6)	1 (2.9)	5 (14.3)

**Table 2. Chi-square results between the stages of change in doing resistance exercise and the demographic data**

	Stage of change p
Age	0.458
Education level	0.072
Marital status	0.399
Number of children	0.639
Working hours	0.027
Income	0.294

### 3.2. Knowledge on Resistance Exercise

The participants' knowledge on the benefits of resistance exercise was tested. There were altogether 11 knowledge items. One mark would be given for each correct answer and zero mark for a wrong answer. The results in Table 3 show the number of subjects who responded correctly to each of the items. A majority of the participants, 67% (245 out of 366), passed the knowledge test. The mean score was 4.34 which was slightly higher than the passing mark set at 4. About all of the participants, 94% (344), knew that resistance exercise would not increase the risk of injury. On the other hand, only 4.1% (15) of the participants thought that resistance exercise would increase body mass, and 15.8% (58) thought that it would prevent incontinence. In addition, 27.3% (100) of the participants thought resistance exercise would enlarge social circle, whereas 30.9% (113) thought resistance exercise could improve self-esteem, self-efficacy, and self-confidence. Kruskal-Wallis test was conducted to

examine the significant difference, if any, in knowledge regarding the demographic data. Table 4 shows the results that their number of children ( $p=0.049$ ) and working hours ( $p=0.008$ ) had strong relationship with their knowledge on resistance exercise.

**Table 3. Number of subjects who responded correctly**

Knowledge items	Number n (%)
Sample (n=366)	
Maintain body weight	183 (50%)
Prevent fall	158 (43.2%)
Prevent osteoporosis	193 (52.7%)
Increase bone mass	117 (32%)
Have a better activity of daily living	190 (51.9%)
Won't increase risk of injury	344 (94%)
Enlarge social circle	100 (27.3%)
Increase body mass	15 (4.1%)
Improve quality of life	142 (38.8%)
Improve self-esteem, self-efficacy, and self-confidence	113 (30.9%)
Prevent incontinence	58 (15.8%)

**Table 4. Kruskal-Wallis results between knowledge on resistance exercise and the demographic data**

	Knowledge on resistance exercise Significant difference
Age	-
Education level	-
Marital status	0.497
Number of children	0.049
Working hours	0.008
Income	0.096

**Table 5. Barriers to resistance exercise (1-strongly disagree, 2-disagree, 3- agree, 4- strongly agree)**

Current opinions on resistance exercise Sample (n=366)	Mode (Percentage)	Mean (SD)	Frequency*
I think that I have good knowledge on resistance exercise.	2 (56.0%)	2.07 (0.71)	276
I think that I know the benefits brought by resistance exercise.	3 (42.3%)	2.45(0.76)	274
I think that I am healthy.	3 (59.0%)	2.70(0.63)	269
I think that everyone needs resistance exercise.	3 (44.0%)	2.61 (0.76)	241
I think that women DON'T have to do resistance exercise.	2 (53.8%)	2.12(0.76)	238
I think that not doing resistance exercise is a problem.	2 (55.2%)	2.33 (0.71)	237
I am afraid of getting "too chunky" after doing resistance exercise.	3 (40.4%)	2.34 (0.82)	218
I am afraid that "I will get injured" during resistance exercise.	3 (49.2%)	2.56(0.80)	218
I do not know how to start doing resistance exercise.	3 (49.7%)	2.63(0.74)	212
I do not know where I can do resistance exercise.	3 (45.1%)	2.56 (0.79)	212

Current opinions on resistance exercise Sample (n=366)	Mode (Percentage)	Mean (SD)	Frequency*
There are no community resources for resistance exercise.	3 (48.1%)	2.61 (0.76)	201
There are not enough community resources for resistance exercise.	3 (62.6%)	2.84 (0.67)	188
I think that the fee for the training facilities is too expensive.	3 (48.6%)	2.63 (0.77)	173
Nobody accompanies me to do resistance exercise.	3 (50.8%)	2.74(0.76)	171
I do not have time to do resistance exercise.	3 (52.5%)	2.73 (0.74)	165
I feel tired because of the heavy workload at work/school.	3 (52.5%)	2.91 (0.74)	163
I am a caregiver.	2 (50.0%)	2.03 (0.78)	149
I am intimidated by the dominating male presence in resistance exercise facilities.	2 (42.6%)	2.28 (0.79)	136
I have no energy to do resistance exercise.	3 (42.6%)	2.34 (0.74)	132
It is not worth the time and effort to do resistance exercise.	2 (47.0%)	2.27 (0.79)	98
I do not have money for doing resistance exercise.	2 (42.3%)	2.34 (0.79)	91

\*The number of respondents agreed and strongly agreed the statement represent a barrier to them.

### 3.3. Barriers to Resistance Exercise

Barriers to resistance exercise were assessed using a 4-point scale ranging from 1 (“strongly disagree”) to 4 (“strongly agree”) to reflect the participants’ current situation. Table 5 shows the mode and mean scores for each item. The results indicated that the top five barriers were “lack of knowledge”, “feel tired because of heavy workload”, “not enough community resources”, “lack companions”, and “lack time to do resistance exercise”. Pearson correlation was used to ascertain the relationship between the number of barriers that participants rated and their demographic characteristics. The results show in Table 6 that their age ( $p=0.006$ ), number of children ( $p=0.015$ ), and working hours ( $p=0.006$ ) were significantly correlated to the number of barriers that they rated. In addition, the number of barriers that the participants rated and the total number of correct answers on the benefits test were negatively correlated ( $p=0.017$ ).

**Table 6. Pearson correlation relationship between the number of barriers that participants rated and their demographic characteristics**

	The number of barriers	
	r	P
Age	0.144	0.006
Education level	-0.040	0.448
Marital status	0.052	0.320
Number of children	0.127	0.015
Working hours	0.142	0.006
Income	0.077	0.141
Correct answer of benefit	-0.125	0.017

## 4. Discussion

This study examined the reasons and barriers to Hong Kong women’s participation in resistance exercise. The results found only 59 (16%) participants belonged to the active group (Stages 4 & 5 of the Stages of Change), indicating that a majority of them were not meeting the exercise requirements that could help them prevent chronic diseases and achieve desirable health benefits. Participants across different stages were found to have different reasons and barriers for doing/not doing resistance exercise. Time and resources were frequently cited as the barriers. Among the barriers, becoming too

chunky, getting injured, finding facility fees too expensive, and having no time had the highest percentage differences between the active and less active groups.

The most noticeable barrier identified was the participants’ lack of knowledge about resistance exercise as about three quarters of them refuted the statement - “I think that I have good knowledge on resistance exercise”, with 71 (19.4%) of them strongly disagreed and 205 (56%) disagreed. Undoubtedly, the government in partnership with the health professionals could do more on promoting resistance exercise to raise public awareness.

The second biggest barrier was the participants’ workload at work or school. A majority felt they were too tired to take up the exercise after finishing work or school. There were 77 (21%) of them who strongly agreed and 192 (52.5%) agreed that this was their reason for not doing resistance exercise. There was a significant correlation between participants’ tiredness and their length of working hours ( $p=0.006$ ). From the collected data, over one-fifth of them worked over 45 hours per week, and 5% even worked over 50 hours per week. This has not taken into account the hours they spent in household chores or caring family members after work. The finding indicated that working women spent lengthy time in their work - paid or unpaid - were too tired to do any resistance exercise. According to a survey conducted by the United Bank of Switzerland (UBS) in 2015, Hong Kong people worked more than 2,600 hours a year, with a working week averaging 50.11 hours which was the longest in the world.

The third major barrier identified was the lack of enough community resources for resistance exercise - 45 (12.3%) participants selected ‘strongly agree’ and 229 (62.6%) ‘agree’ to the statement “There are not enough community resources for resistance exercise”. This is significant as 75% of the participants thought there were not enough community resources and therefore, for not doing any resistance exercise. Most, if not all, thought the exercise needed equipment and facilities provided in the gym. However, in recent years, the government has built more sports centers and parks. This reflected their misunderstanding about resistance exercise. In reality, exercise only requires at the minimum equipment like resistance bands, stretch bands, carrying bags, or in indoor facilities like door anchors and staircases in buildings. In view of the misunderstanding, extra customized promotion needs to be developed with incentives to inform and



encourage Hong Kong women to do more resistance exercise not just in gyms, but at home or in parks.

Another observation was that women aged 33-42 and 58-64 faced more barriers to resistance exercise than the other age groups, and these two groups had a higher percentage of caregivers. Indeed, family roles and obligations create huge barriers to women. In contemporary society, women's roles are multi-faceted. Apart from full-time careers, they also assume the roles of a mother, a wife, and sometimes a carer at home to take care of their children, husbands, and in-laws. They usually have these as their priorities whilst unknowingly pushing their health aside and giving up their leisure time.

Low participation in resistance exercise was evident when only 16% of the participants were in the action and maintenance stages. The participants in these stages on average identified 10.3 and 8.3 barriers out of the 21 barriers respectively. As a matter of fact, Hong Kong women do not want to be muscular, and this is the most common barrier to resistance exercise. Even in Western countries, studies found that women usually held the idea that muscular bodies were unattractive [15,30]. Nevertheless, they did not realize that normal resistance training would never develop muscles in a way like those of female bodybuilders [31,32]. In this study, only 47% of the participants viewed a muscular body as a barrier, which ranked 13 out of 21 barriers. It brings out that cultural differences and knowledge may lead women to view barriers towards resistance exercise differently.

## 5. Conclusion

Resistance exercise is known to prevent chronic illness and improve quality of life. This study has identified the barriers to resistance exercise among Hong Kong women and calls for public attention to the exercise. Our findings revealed that Hong Kong women did not have enough knowledge on the exercise and its benefits. To achieve healthy quality of life for women, there is a pressing need to eliminate as many barriers, whether perceived or experienced, as possible. In this regard, family members, employers, government, and the women should all have different and important roles to play.

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