

Research article

Effects of Physical Activity and Counselling Interventions on Health Outcomes among Working Women in Shanghai

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Abstract

Working women in Shanghai are a high-risk group of suffering work stress and burnout. Women have been found to be affected by work-family conflicts, which results in lower health-related quality of life (HRQoL), higher job stress, and burnout. This study evaluated the potential physical activity and counselling intervention effects on health outcomes of working women in Shanghai. Participants were randomly recruited from eight communities of Shanghai using the stratified cluster sampling method. A total of 121 female workers took part in this study, who were randomly divided into three groups: a control group and two intervention groups (individual-based and group-based intervention). The first intervention involved a moderate physical activity program and an individual based counselling intervention, while the second included the same physical activity program, but with a group counselling approach. Both interventions lasted 12 weeks. Subjective perceptions of work stress, burnout, and HRQoL were measured before and after the intervention. In the control group, the HRQoL value decreased after the intervention, with the mean value falling from 91.59 to 87.10, while there was no significant difference found between participants for stress ($p = 0.752$) and burnout ($p = 0.622$) before and after the intervention. After the intervention, the value of stress and burnout decreased, and the value of HRQoL increased in the two intervention groups. At the intervention's completion, there were significant differences compared between the two intervention groups and the control group separately regarding changes in burnout and HRQoL (all $p = 0.000$). For stress, the group-based intervention group exhibited a significant difference compared to the control group ($p = 0.000$), while the individual-based intervention group did not ($p = 0.128$). A Physical activity and counselling intervention delivered either in a group or individual format could reduce stress, burnout, and improve HRQoL of working women in Shanghai, and the group interventions were potentially more effective than those targeted at individuals.

Key words: Stress; burnout; quality of life; working women; Shanghai.

Introduction

As one of the most modern and industrialized cities in China, Shanghai has exhibited rapid economic development and become China's leading financial center in the past decades (Zhu, 2019). Due to the fast socio-economical development and continuous improvement of women's status, significant changes and positive transformations have occurred in the daily lives of the city residents, especially for women. More and more women were not confined to the family but entered into the social workplace to

realize their own life values. Meanwhile, the life pace in Shanghai is accelerating, and people are increasingly immigrating to Shanghai to work, which makes the working environment more competitive, and increasingly exposes workers to job stress, and burnout (Sun, 2012). Job stress is a physical and/or mental reaction that occurs when the external environment or working conditions are perceived to be uncontrollable and threatening (Hansen et al., 2010). The most widely accepted definition of burnout is that of Maslach and Jackson (1981): "a psychological syndrome of emotional exhaustion, depersonalization, and reduced accomplishment that can occur among individuals who work with other people in some capacity".

Working women in Shanghai represent a specific demographic group and are a large, increasing population. As of 2013, there were 7.52 million female workers in Shanghai (Shanghai Municipal Statistics Bureau, 2013). They bear both work and family responsibilities. In the workplace, they must work hard to realize their value in life and at the same time play a good wife and loving mother role in family life (Chen, 2018). Under the double influence between the traditional gender concept of "male advocate outside, female advocate inside" and the modern social and family labor division of "men's and women's equality", women play a dual role (home and work) in the society. While women's participation is increasing in economic life, their payment on home affairs is not reduced accordingly (Zhang, 2016). The workplace life and family life are much different, which makes it easy for working women to have family and work conflicts (Chen, 2018). This so-called "second shift" phenomenon places significant demands on working women's time. The necessity to fulfill multiple roles makes work-family conflicts virtually inevitable, which often results in job dissatisfaction, job stress, and adverse health outcomes (Poms et al., 2016).

Researchers have demonstrated that working women with both work and family obligations report higher levels of physical and psychological stress than male employees. Such stress results from high expectations coupled with insufficient time, skills, and social support (Bekker et al, 2000). Working women must spend more time and energy on arduous and stressful work to keep pace with the city's development (Başlevent and Kirmanoğlu, 2017). Stress can occur because of the type of occupation, one's status and position within the occupation, gender composition within the occupation and gender differences in interpreting stress (Richardson et al., 2016). Stress can inspire certain individuals, however, excessive stress has a severe impact on one's working performance and has been

related to various negative mental and physical health outcomes, such as job burnout (Hämmig and Bauer, 2013). Prolonged stress can contribute to employment absenteeism, increased health expenses, and ultimately reduced work effectiveness and income (Nigdelis et al., 2018). In recent years, burnout has come to be regarded as a common work-related phenomenon. Different from job stress, burnout exhibits a multidimensional symptomatology, which is partly related to a high initial level of motivation, and primarily results from a breakdown in adapting to prolonged stress (Roy et al., 2017). Studies have demonstrated that work-related stressors such as high work demand and excessive workloads, and work-home conflict were the main contributors to burnout (West et al., 2018), and high job demand and low levels of control have been associated with high levels of burnout in women (Hanson et al., 2008). How to perform and harmonize both duties well has been a heavy burden for working women.

Physical activity (PA) and exercise behavior play an important role in improving an individual's perception of health-related quality of life (HRQoL) (Jelinek et al., 2016). HRQoL is a multidimensional concept that includes the individual's physical health, psychological health (such as stress), social relationships, and environment (WHOQOL Group, 1998). Research conducted by Wu and colleagues (2011) showed that occupational stress, personal strain, and job burnout were correlated negatively with the HRQoL. Studies have demonstrated that PA can contribute to alleviating negative health-related outcomes, which could significantly improve the quality of life of working mothers (Monteiro et al., 2017), while strong evidence showed that physical inactivity increased the risk of many adverse health conditions, including major non-communicable diseases such as coronary heart disease, type 2 diabetes, and breast and colon cancers (Lee et al., 2012). Further research showed that higher levels of leisure-time physical activity (LTPA) were significantly related to higher levels of HRQoL in both men and women (Nakamura et al., 2014). Besides, PA can result in increased functional capacity, improved mood, increased self-esteem, better adjustment to illness, decreased distress, improved body image, decreased fatigue and emotional distress, and reduced depression and anxiety (Miller et al., 2016). Naumann et al. (2012) proved this with their experiment, in which all healthy participants achieved significant improvements in physical and psychological HRQoL domains relative to no-exercise controls, and a moderate positive effect of exercise interventions was found for overall HRQoL in participants. PA intervention (such as running, biking, walking, and dancing) was effective in improving physical functioning, reducing stress and burnout.

Meanwhile, PA intervention could improve physical and psychological well-being, which meant higher HRQoL and lower stress and burnout (Floyd and Moyer, 2010). As for the specific form of exercise intervention, the Social Cognitive Theory emphasizes on individual initiative, and it advocates that an individual is able to manage and control his or her life rather than passively accepting or changing themselves to adapt to the environment. Within the field of health promotion, researchers have suggested that the individual could also be influenced by group

approaches (Kiviniemi et al., 2011; Bandura, 2018). Indeed, studies indicated that the group exercise format might offer participants additional benefits through greater social support, greater group cohesion, and comradeship by sharing the same physical and psychological challenges, while there were also other reference that had shown the opposite opinion, which insisted that individual intervention was more effective (Naumann et al., 2012). Apart from PA intervention, a multilevel intervention also displayed significant improvements in depressive symptoms and social support (Li et al., 2011).

Although several intervention studies have been performed on female populations, most of them primarily focused on outpatients or individuals with certain chronic diseases (Eyigor et al., 2007; Pelletier et al., 2017). Only a limited number of intervention studies have focused on working mothers (Mailey and McAuley, 2014; Travasso et al., 2014). In addition, according to the Reciprocal Determinism of Social Cognitive Theory, behavior, human internal factors (such as cognitive factors, emotional factors) and the environment are interrelated and mutually determined (Zhao et al., 2018). Consequently, the promotion of physical activity within a controlled environment alongside an intervention targeted at supporting individuals to control their thoughts and emotions could impact positively physical activity and such psychological outcomes as stress and quality of life.

Focusing on outcome measures, most intervention studies have only addressed single health outcomes, such as HRQoL, depression or physical performance. Few studies have investigated the impact of PA and counselling interventions on working women's health outcomes (e.g., stress, burnout, and quality of life), particularly in a specific city, such as Shanghai. Therefore, the primary purpose of this study is to investigate the effect of a PA and counselling intervention on health outcomes of working women in Shanghai with data collected at baseline and 12-week follow-up assessments. This study evaluated the potential of a PA and counselling intervention to decrease work-related stress and burnout and improve health-related quality of life of working women participating in a group- or individual-based PA and counselling intervention compared to controls.

It was hypothesized that both group-based and individual-based PA and counselling interventions could decrease work-related stress and burnout and improve health-related quality of life among the women compared to a control group, and that a group-based PA and counselling intervention could achieve additional benefits, such as building good social relationships as opposed to individual exercising.

Methods

Participants

Participants were working women randomly recruited from eight communities in Shanghai China using the stratified cluster sampling method. Participants were either friend-referrals or self-referrals based on advertisement and recruitment events in communities. The participants were gathered in the Sports Health Service Center of

Shanghai University of Sport for screening. The sampling inclusion criteria were: aged 25 to 60 years, Shanghai residents, not retired, without joint or muscular abnormalities, and having the ability to participate in PA and complete the health outcomes questionnaires. A total of 70 participants were needed for this study to reach a power of 80% at an alpha level of 0.05 based on a statistical power analysis to detect an effect size of $ES = 0.25$ (Faul et al., 2009).

A total of 225 individuals indicated an interest in participating in the study. Of them, 135 completed the baseline measures and were randomized into three groups: group-based intervention group (ExpG, $n = 46$), individual-based intervention group (ExpI, $n = 44$), and control group (Ctrl, $n = 45$). The participants in ExpG were randomly allocated with each group of 6-8 women. Of the 135 randomized participants, an additional 14 participants were lost at the 12-week follow-up. Five participants dropped out from lack of interest, and four dropped out because of schedule/time conflicts. In addition, five cited family/personal issues that prevented continuing participation. Finally, a sample of 121 employed women who met the inclusion criteria was enrolled in the study and completed the pre- and post-measures (Figure 1). This study obtained the approval of the ethics committee in Shanghai University of Sport. All participants signed consent forms before they joined the study and were provided a full explanation regarding the purpose and potential benefits/risks of the study, confidentiality, and their right to withdraw from the study.

Measures

Demographic variables: To characterize the participants in this study, self-reported personal information on age and race were obtained using questionnaires.

Stress: The Chinese version of the Psychosomatic Tension and Relaxation Inventory (PSTRI) was used to measure stress, which included both physical and psychological stress (McGuigan et al., 1980). This inventory consists of 50 items rated on a Likert scale from 1 (never) to 5 (always). The total score on the 50 items was used to measure the level of perceived stress. Higher PSTRI scores indicated higher levels of stress. In this study, the Cronbach's alpha of this scale was .95.

Burnout: Job burnout was measured by the 15-item Maslach Burnout Inventory-General Survey (MBI-GS) developed by Maslach and Jackson (1981). The survey consists of three dimensions: emotional exhaustion (5 items), professional efficacy (6 items), and cynicism (4 items). All the items were rated on a Likert scale from 1 (never) to 7 (every day). Lower scores on the dimension of professional efficacy and higher scores on the dimensions of cynicism and emotional exhaustion denoted higher levels of job burnout. The Chinese version of the MBI-GS was translated back into English to test language validity. The Chinese MBI-GS has been found to exhibit good reliability and validity and has been widely used in Chinese populations (Rizvi et al., 2018). In this study, the Cronbach's alpha coefficient for the total scale was .71. The Cronbach's alpha coefficients of emotional exhaustion, cynicism, and professional efficacy were 0.86, 0.79, and 0.90, respectively.

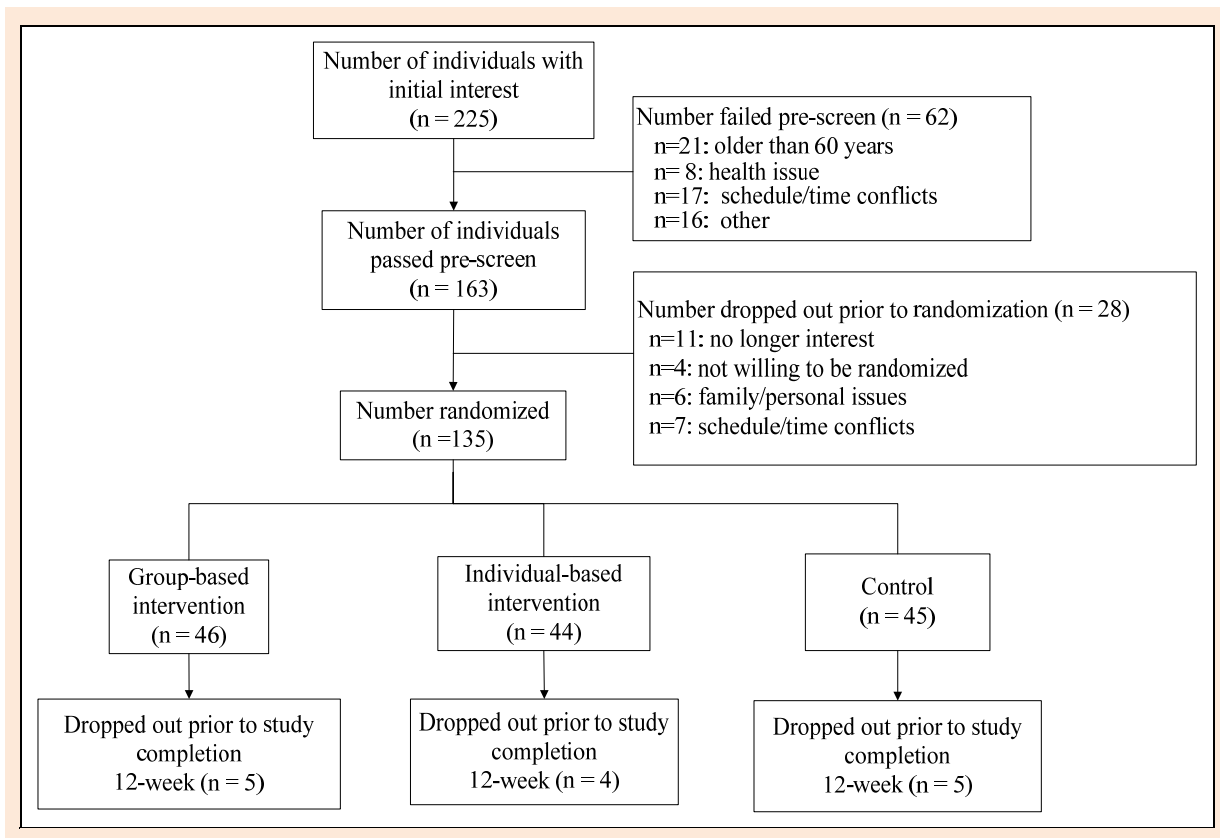


Figure 1. Participant flow through the study

HRQoL: HRQoL was measured by the Chinese version of the Quality of Life Scale-Brief (WHOQOL Group, 1998), which was modified from WHOQOL-100 and translated into Chinese. The scale consists of 26 items and includes four dimensions: physical health, social relationships, psychological status, and environment. The sample items are: “Do you have enough energy for everyday life (physical health)?”, “How much do you enjoy life (psychological health)?”, “How satisfied are you with the support you get from your friends (social relationship)?”, and “How satisfied are you with your access to health services (environment)?”. Each item is rated on a five-point Likert scale (1 = very dissatisfied; 5 = very satisfied). Item scores for each dimension were coded/recoded and summed to obtain the total HRQoL score, with a higher total score indicating a better quality of life. In this study, the Cronbach’s alpha coefficients of physical health, psychological, social relationships, and environment were 0.76, 0.72, 0.75, and 0.79, respectively.

Procedure

The participants who signed the consent form were directed to the Sports Health Service Center of Shanghai University of Sport to complete the physical fitness tests and baseline self-reported questionnaires on work stress, burnout, and HRQoL. All the devices for physical fitness tests were from TKK Company of Japan, except for the device for Bone Mineral Density test, which was from GE Express of USA. Subsequently, the participants were randomly assigned to one of three groups: group-based intervention ($n = 41$), individual-based intervention ($n = 40$), or waitlist control ($n = 40$). Randomization was completed by an independent investigator who was not involved in data collection or intervention delivery. For all groups, follow-up data were collected in the same manner as the baseline data immediately after the three-month intervention. During the 12-week study duration, the control group did not receive any specific instructions relative to PA (i.e., they were free to continue their regular routines and exercise if they wished). This study was approved by the study venues.

Intervention: There were two types of intervention in this study, which were the physical activity intervention and the counselling intervention.

For the physical activity intervention, there were four intervention-related variables: intervention type, intervention frequency (i.e., times per week), the number of weeks, and the hours per session. The latter 3 variables can be considered as indexes of the intensity of the intervention. Two different exercise interventions were involved: (1) a group-based intervention delivered in a group format and (2) an individual-based intervention delivered in an individual format. The intensity of the individual exercise intervention group was three times per week for 45–60 min per session. The goal for each participant was 150 min of PA per week with moderate intensity. Each exercise program was individualized according to baseline health, fitness levels, and personal goals. Three parts were included in the individual exercise program: warm-up, cardiovascular training (cycling, cross-training, brisk walking), and a

cool-down period. The group exercise cohort also exercised three times per week for 45–60 min per session, with a similar target goal of 150 min per week of moderate-intensity PA. The group exercise program also consisted of three parts: warm-up, cardiovascular training (cycling, cross-training, brisk walking), and a cool-down period. Although they participated in the same exercise activities, group-based intervention group held team-focused activities, such as competitions among different groups or tasks that needed to be done together, thereby helping to foster team cohesion. All exercises were led by the same accredited exercise instructors.

The purpose of the counselling intervention was in order to increase the likelihood of the participants engaging, initiating, and maintaining the physical activity component. The principle of counselling intervention was client-centered, which means all the activity launched was based on the needs of each participant. Facilitating disclosure of feelings and anxieties, clarifying issues and providing reassurance and support for the women as required were the duty of the counsellor. The individual and group counselling interventions were both conducted once a week for one hour, and the group counselling intervention was in groups of six to eight women. General themes covered were the following: work-family conflicts, stress, burnout, anxiety, self-efficacy, and health-related quality of life. The counselling happened at the end of the third exercise intervention every week. In the study period of 12 weeks, there was no specific exercise or counselling that participants in the control group need to engage in.

Data analysis

The data were analyzed using Statistical Product and Service Solutions (SPSS 22.0, SPSS Inc.) software. Descriptive statistics were calculated for all variables. Data normality was verified by using the Kolmogorov-Smirnov test. Multivariate analysis of variance (MANOVA) with repeated measures was performed between different groups to examine differences at baseline and after the 12-week intervention. To account for multiple testing, Bonferroni corrections, with adjusted CIs, was performed to investigate the differences between groups. An alpha level of .05 was used to determine statistical significance. Effect sizes (ESs) were calculated utilizing the mean and standard deviation (.2 or less is a small ES; approximately .5 is a moderate ES; .8 or more is a large ES) (Thalheimer and Cook, 2002).

Results

To compare the impact of exercise and counselling intervention on health outcomes between different groups at baseline and at the post-intervention time point, a MANOVA with repeated measures was performed. As the p -value of Mauchly’s Test of Sphericity was less than 0.05, the Multivariate Test results were used to examine the difference between groups. In this study, the effect of Pillai’s trace was chosen to reveal the significance of the main effects of ‘time’ and ‘group’ and the interaction effect ‘time

x group’. The multivariate test results were shown in Table 1.

There are three effects, i.e. the main effect of ‘time’ and ‘group’ and a ‘time x group’ interaction effect. The ‘time x group’ interaction effects of all health outcomes were significant (all $p < 0.05$) except for stress (Pillai’s Trace = 0.029; $F(2, 118) = 1.790, p = 0.171 (p > 0.05)$, partial eta squared = 0.029) (Table 1). The main effects of ‘time’ for EE, Cynicism, PE, Burnout, PH, and SR were significant. The main effects of ‘group’ for all health outcomes were significant (all $p < 0.05$) except for PH and SR ($p = .159$ and $p = .259$, respectively).

Pairwise comparisons were also performed to compare the differences between different groups at baseline (pre) and after (post) the 12-week intervention (Table 2). There were no significant differences between different groups for all the variables before the intervention (all $p > 0.05$) (Table 2). At the intervention’s completion, there were significant differences between both intervention groups and the control group for burnout and HRQoL over time (Exp_G vs. Ctrl: $p < 0.01, p < 0.01$; Exp_I vs. Ctrl: $p < 0.01, p < 0.01$). For stress, ExpG exhibited a significant difference compared to Ctrl (ExpG vs. Ctrl: $p < 0.01$), while ExpI did not exhibit a significant difference compared to Ctrl (ExpI vs. Ctrl: $p = 0.128$). Regarding the HRQoL subscales, there was a significant difference for

social relationships between the two intervention groups (ExpG vs. ExpI: $p < 0.01$), with the group-based intervention improving significantly more than the individual-based group (ExpG vs. Ctrl: $p < 0.01, ExpI vs. Ctrl: p = 0.215$) (Table 2).

Pairwise comparisons were conducted to compare the pre- and post-differences between different groups (Table 3). In the control group, no significant difference was found between participants for stress ($p = 0.752$) and burnout ($p = 0.622$) before and after the intervention. Nevertheless, the HRQoL value significantly decreased after the intervention ($p < 0.01$), with the mean value falling from 91.59 to 87.10 (Table 3).

After the intervention, the value of stress and burnout decreased, and the value of HRQoL increased in ExpG and ExpI (Table 3). At the completion of intervention, there were significant differences both in ExpG and ExpI regarding changes in burnout and HRQoL over time (ExpG: $p < 0.01, ES = 0.601, p < 0.01, ES = 0.463$; ExpI: $p < 0.01, ES = 0.530, p = 0.018, ES = 0.295$). After the entire 12-week moderate PA and counselling intervention, the individual-based intervention did not exhibit a significant difference for stress ($p = 0.363$), while the group-based intervention displayed a significant difference for stress ($p = 0.021, ES = 0.282$).

Table 1. Multivariate tests results.

Variables	Effect value(Pillai’s Trace)			F value			p-value		
	Time	Group	Time x Group	Time	Group	Time x Group	Time	Group	Time x Group
Stress	.022	.119	.029	2.671	7.990	1.790	.105	.001**	.171
EE	.336	.085	.089	59.751	5.545	5.732	.000**	.005**	.004**
Cynicism	.066	.056	.174	8.393	3.486	12.397	.004**	.034*	.000**
PE	.173	.211	.247	24.665	15.792	19.303	.000**	.000**	.000**
Burnout	.279	.274	.205	45.639	22.289	15.204	.000**	.000**	.000**
PH	.077	.031	0.051	9.798	1.869	3.165	.002**	.159	0.046*
Psy	.009	.062	.107	1.060	3.872	7.036	.305	.024*	.001**
SR	.167	.023	0.96	23.709	1.365	6.238	.000**	.259	.003**
Env	.006	.224	.314	.682	17.055	27.051	.410	.000**	.000**
HRQoL	.009	.279	.298	1.039	22.816	25.063	.031	.000**	.000**

EE: emotional exhaustion, PE: professional efficacy, PH: physical health, Psy: psychological, SR: social relationships, Env: environment; ** $p < 0.01$, * $p < 0.05$.

Table 2. Pairwise comparisons between three groups at baseline (pre-) and after the 12-week intervention (post-) (n = 121).

Variables	Exp_G vs. Ctrl				Exp_I vs. Ctrl				Exp_G vs. Exp_I			
	p-value (Pre-)	ES (Pre-)	p-value (Post-)	ES (Post-)	p-value (Pre-)	ES (Pre-)	p-value (Post-)	ES (Post-)	p-value (Pre-)	ES (Pre-)	p-value (Post-)	ES (Post-)
Stress	0.275	0.170	0.000**	0.455	0.851	0.044	0.128	0.256	0.345	0.145	0.004**	0.261
EE	0.769	0.039	0.000**	0.554	0.809	0.004	0.000**	0.442	0.488	0.040	0.049*	0.248
Cynicism	0.444	0.115	0.000**	0.543	0.202	0.167	0.000**	0.382	0.707	0.057	0.012*	0.305
PE	0.708	0.006	0.000**	0.667	0.212	0.126	0.000**	0.612	0.065	0.136	0.030*	0.263
Burnout	0.163	0.176	0.000**	0.716	0.408	0.085	0.000**	0.632	0.452	0.094	0.003**	0.330
PH	0.450	0.090	0.000**	0.678	0.554	0.076	0.000**	0.540	0.095	0.200	0.014*	0.298
Psy	0.519	0.094	0.000**	0.432	0.786	0.025	0.004**	0.312	0.709	0.075	0.064	0.214
SR	0.325	0.126	0.000**	0.388	0.063	0.254	0.215	0.115	0.546	0.082	0.000**	0.528
Env	0.521	0.070	0.000**	0.401	0.816	0.000	0.000**	0.565	0.550	0.077	0.690	0.099
HRQoL	0.843	0.055	0.000**	0.588	0.817	0.026	0.000**	0.528	0.681	0.033	0.012*	0.274

EE: emotional exhaustion, PE: professional efficacy, PH: physical health, Psy: psychological, SR: social relationships, Env: environment; ** $p < 0.01$, * $p < 0.05$.

Table 3. Pairwise comparisons (pre and post) by group (n = 121, 3 times of comparison). Data are means \pm SD.

Variables	Exp_G (n = 41)			Exp_I (n = 40)			Ctrl (n = 40)		
	Pre-	Post-	p-value	Pre-	Post-	p-value	Pre-	Post-	p-value
Stress	87.17 \pm 7.41	77.68 \pm 21.62	0.021*	91.40 \pm 18.96	87.88 \pm 15.59	0.363	93.30 \pm 23.95	94.73 \pm 9.51	0.752
EE	11.46 \pm 3.98	7.61 \pm 1.34	0.000**	11.75 \pm 3.31	8.35 \pm 1.54	0.000**	11.78 \pm 4.15	10.70 \pm 3.00	0.138
Cynicism	8.36 \pm 3.44	5.83 \pm 1.26	0.000**	8.78 \pm 3.92	6.85 \pm 1.87	0.004**	7.65 \pm 2.64	9.08 \pm 3.32	0.026*
PE	20.32 \pm 7.34	11.39 \pm 4.48	0.000**	18.28 \pm 7.54	13.53 \pm 3.27	0.000**	20.23 \pm 7.79	22.65 \pm 7.67	0.100
Burnout	37.19 \pm 10.66	24.83 \pm 4.63	0.000**	39.28 \pm 11.42	28.23 \pm 5.10	0.000**	41.30 \pm 12.21	42.43 \pm 11.21	0.622
PH	26.71 \pm 2.13	30.10 \pm 1.85	0.000**	27.7 \pm 2.68	28.95 \pm 1.84	0.039*	27.23 \pm 3.47	26.35 \pm 2.20	0.154
Psy	23.19 \pm 2.50	24.07 \pm 2.37	0.115	23.55 \pm 2.27	23.15 \pm 1.78	0.391	23.67 \pm 2.59	21.67 \pm 2.64	0.002**
SR	11.07 \pm 2.24	12.85 \pm 1.57	0.000**	10.75 \pm 1.59	11.10 \pm 1.22	0.213	11.55 \pm 1.45	11.45 \pm 1.75	0.740
Env	30.05 \pm 3.77	31.29 \pm 4.33	0.124	29.50 \pm 3.29	31.96 \pm 1.95	0.000**	29.50 \pm 4.05	27.63 \pm 4.02	0.006**
HRQoL	91.02 \pm 6.95	98.32 \pm 7.02	0.000**	91.50 \pm 7.47	95.13 \pm 3.67	0.018*	91.95 \pm 9.58	87.10 \pm 8.37	0.009**

EE: emotional exhaustion, PE: professional efficacy, PH: physical health, Psy: psychological, SR: social relationships, Env: environment; M = mean, SD = standard deviation; ** p < 0.01, * p < 0.05.

Discussion

As hypothesized, at the end of the 12-week intervention, significant differences in health outcomes were observed in both exercise groups except the stress value in the ExpI. Nevertheless, no significant difference was found in the control group across time, except that the HRQoL value decreased, perhaps because the participants in the control group did not participate in scheduled exercise or counselling during the 12 weeks. Participants enrolled in a group or individual exercise program exhibited significant reductions in their total scores for stress and burnout. They also exhibited significant improvements in their total scores for health-related quality of life when compared to no-exercise controls (Table 2). This finding is consistent with previous studies (Hale et al., 2008; Roy et al., 2017). Bettaieb et al. (2015) found that PA could contribute to alleviating negative health-related outcomes and significantly improve health-related quality of life among working mothers. The results from the literature suggest that regular PA is positively related to health-related outcomes and results from this study indicate that PA and counselling (group or individual) interventions are effective in improving health-related outcomes for working women in Shanghai. Thus, programs to promote regular exercise should be developed and encouraged for these women to prevent stress, burnout and improve their health-related quality of life.

Slaughter's essay (2012) "Why Women Still Cannot Have It All" emphasized the challenges faced by working mothers. Bettaieb et al. (2015) put forward that social load, physical and mental workload significantly influenced the quality of life. The result of this study indicated that a group-based PA and counselling intervention could achieve additional benefits in social relationship, which was consistent with Carron and his colleague's research. They found that group exercise format may offer additional benefits through greater social support, greater group cohesion, and relationship among group members sharing the same physical and psychological challenges (Carron et al., 1998). Combine with the result of Mailey and McAuley's research (2014) that similar PA barriers and facilitators had expressed by working mothers and fathers, it is suggested that future intervention may consider targeting mothers and fathers in tandem to make policy or offer welfare to them so as to reduce the heavy burden and increase PA of women.

Group cohesion has been defined as "a dynamic process reflected by the tendency of a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of members' collective needs" (Carron et al., 1998). Better social well-being and health outcomes may be achieved by group-based exercise and counselling interventions rather than individual-based exercise and counselling interventions. In addition, Sushames and Jannique (2016) observed that the PA level was significantly associated with health-related quality of life. This finding agreed with a study by Gottlieb and Wachala (2007), who found that group interventions had more positive effects on participant psychological well-being by improving nearly every HRQoL domain. Therefore, working women were encouraged to participate in group activities, such as team or outdoor extending activities, and follow the physical instructors' advice. Only with professional guidance, can the more obvious intervention effects be obtained.

Social support is defined as those activities performed by an individual that aid another person in reaching a desired goal and can be classified into four types of support-related exercise behavior: instrumental support, informational support, emotional support, and appraisal support (Berkman, 1995). Social support can help to increase PA and can be provided at an individual level by family, friends, or others who furnish encouragement to strengthen an individual's motivation to be physically active. Participants who feel rejected and lonely and thus dissatisfied with their social support may have poor emotional health and a poor perception of HRQoL (Chui and Chan, 2007). Meanwhile, the physical and mental components of the HRQoL were the important factors associated with work ability. Tavakoli-Fard et al.'s research (2016) found that work ability of a majority of women was moderate, which means that both physical and mental health of working women should be emphasized. Health authorities and policy makers can use the findings mentioned above to develop and implement programs to promote women's engagement in health-promoting behaviors and thereby, improve their quality of life.

Increased cohesion may also result from the facilitated social support received when exercising with other participants with a similar health condition (Hong et al., 2008). It has also been reported that factors such as sharing experiences with other participants and being encouraged

to exercise in group-exercise programs are important in terms of increasing compliance and the psychological comfort of the exercisers (Hale et al., 2008). Exercising in a group rather than individually can provide additional benefits, such as forming a collective identity with other group members, improving one's self-image by the reconceptualization of physical behavior, and motivating one to be physically active (Floyd and Moyer, 2010).

Nevertheless, the findings of this study do not agree with the results of a study by Naumann et al. (2012), who observed that a group exercise intervention did not improve the social well-being score more than the individual exercise setting. The lack of significant improvement in the social well-being domain in the group exercise intervention could be attributed to the fact that the design of a group exercise program may not have involved sufficient social interaction to create psychosocial improvements over and above those of the individual program. Thus, group intervention did not take full advantage of group dynamics. In this regard, one could recommend incorporating more social aspects during the group intervention, such as group exercise goals in which all participants contribute to achieving the final goal, to capitalizing on group dynamics, and to avoiding training individual participants in isolation (Long and Haney, 1988).

Limitations

This study suffered from several limitations. First, this is an intervention outcome study with a relatively small sample size, which limits the coverage of the findings. Second, all the health outcome measures were based on self-reports. Therefore, the participants may have over or underestimated their levels of work stress, burnout, and HRQoL. In addition, only completer analyses are presented. As data were not presented on women's jobs or education, it is unclear whether this intervention could be relevant for women working in, for example, professional or manual occupations. Moreover, it is hard to differentiate whether the intervention effect was caused by exercise or counselling. Future study needs to design a separate experimental group, which only has exercise intervention so as to examine the different effects of the two elements. Third, the participants in this study were drawn from Shanghai, China's economic center. Therefore, the findings of this study cannot be generalized to working women in other Chinese cities because of the differences between these cities and Shanghai. Finally, the lack of the assessment of the fidelity of PA and counselling interventions and the lack of ongoing assessment to a length of time likely to form habits and maintenance are also limiting factors of this study. Because of the short-term intervention, this study could only evaluate the intervention effects on health outcomes at the 12-week follow-up assessment. Therefore, a longitudinal study should be performed to determine whether PA and counselling intervention benefits are sustainable in the long term. Future studies could also be conducted on which exercise program, and of what intensity and duration, would be the most feasible and effective at improving the health outcomes of working women in Shanghai and other cities.

Conclusion

This study examined the effects of a 12-week PA and counselling intervention on health outcomes of working women in Shanghai. This study's findings revealed that a PA and counselling intervention delivered either in a group or individual format could reduce stress and burnout and improve health-related quality of life among the working women compared to controls. In addition, participants exhibited better benefits in the social well-being domain when exercising in groups rather than individually. The findings of this study suggest that interventions aimed at improving these women's perceived abilities to cope with stress from home and work, such as regular exercise and strong social support, are likely related to lower stress, burnout, and higher HRQoL. Despite the study's limitations, several of the findings agree with previous studies, thus confirming this study's validity and encouraging us to believe that this study may have provided a new perspective on the impacts of physical activity and counselling intervention on working women's health outcomes.

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Key points

- A physical activity intervention delivered either in group or individual format could reduce stress and burnout and improve health-related quality of life among the women compared to controls.
- Participants exhibited better benefits in the social well-being domain when exercising in groups rather than individually.
- Interventions aimed to improve women's perceived abilities to cope with stressors from home and work, such as regular exercise and developing strong social support, are likely related to lower stress and burnout and higher HRQoL.

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