Liang Gong for Health Promotion: A Strategy Used in Primary Health Care In Brazil

André Rezende de Azevedo\textsuperscript{1}, Cláudia Regina Cavagliieri\textsuperscript{1}, Roberto Vilarta\textsuperscript{1}, Érika da Silva Maciel\textsuperscript{2}, Milva Maria Figueiredo De Martino\textsuperscript{3} and Jaqueline Girnos Sonati\textsuperscript{4}\textsuperscript{*}

\textsuperscript{1}Department of Adapted Physical Activity, State University of Campinas, Brazil
\textsuperscript{2}Department of Physical Education, University and Lutheran Center of Palmas, Brazil
\textsuperscript{3}Department of Nursing, State University of Campinas, Brazil
\textsuperscript{4}Department of Nutrition, University of Taubaté, Brazil

Abstract

Background: This study was aimed at comparing the physical capabilities and the quality of life of women who practice Liang Gong and women who do not.

Methods: The study was observational, case-control and retrospective. The sample was non-probabilistic, for convenience and composed of 56 women over 60 years old who participate in additional activities of the public health care system. One group practising Liang Gong for six months, minimum attendance of 75\% at three classes a week (n=30) and an average age of 67.8 (±7.30sd) years old. The other group, which does practice Liang Gong (n=26), with an average age of 67.4 years (±6.90sd). The muscular strengths in the upper and lower limbs as well as agility and dynamic balance were evaluated. Whoqol-bref was used to assess the quality of life. The body mass index and waist to hip ratio were used to evaluate the nutritional status.

Results: A comparison of the data between the two groups showed that there was a significant difference between variables of flexibility of the upper limbs (p=0.033), body mass index (p=0.030) and waist to hip ratio (p=0.027). There was no significant difference between the groups for the variables of quality of life.

Conclusions: The women practising Liang Gong showed better flexibility in the upper limbs and better values of body mass index and waist to hip ratio. The practice of liang gong proved to be important for health promotion for women over 60 years.

ABBREVIATIONS

BMI: Body Mass Index; WC: Waist Circumference; WHR: Waist To Hip Ratio; UL: Upper Limbs; LL: Lower Limbs; CNCDs: Chronic Non-Communicable Diseases; GDP: Gross Domestic Product; MCI: Mild Cognitive Impairment; AD: Alzheimer’s Disease; SSRIs: Selective Serotonin Reuptake Inhibitors.

INTRODUCTION

In Brazil, interventions such as Chinese practices involving physical activities have been used in efforts to improve health of mainly for the elderly. These practices of Chinese medicine that are part of the Integrative and Complementary Practices Program, also referred to by the World Health Organization (WHO) as Complementary and Alternative Medicine [1], are carried out Primary Health care Units in several Brazilian cities.

Qi Gong is an ancient Chinese physical activity used for treating and preventing diseases and Liang Gong is one of its main sequences that are widely used in Brazil [2]. This technique has been reported to improve physical functioning and the quality of life in elderly people with chronic non-communicable diseases (CNCDs) [3,4]

This physical activity is intended to prevent problems that result from bad posture or movements that are aggressive to the logic of the human body, and can be an activity that, once practiced regularly, improves day-to-day life activities (DLAs), social interactions and interpersonal relations among the elderly [5].

Qi Gong has the bodily movements focused upon are balance, concentration and coordination with use slow breathing techniques [6-8]. These characteristics are important for health aging.

Regularly engaging in physical activities helps maintain the
health of the biological systems, thereby reducing functional decline and preventing premature death [9]. Therefore, the preservation of physical capabilities during the aging process can contribute to a lessening of the damage to the health of the elderly so that they can keep their independence and autonomy.

Better health among the elderly means more independence for them and a better perception of the quality of life, in addition to reducing public expenditures with health care, incurred mainly from accidents such as falls or muscle sprains [10].

The concept of demographic transition is being intensively examined by studies about aging. These studies also show that developing countries will double their elderly population in the next 40 years [11].

The decrease in the health risk factors, whether intrinsic or extrinsic to the individual, has meant a decrease the mortality rates and an increase in life span and this has presented us with the huge challenge of dealing with the aging population with better health conditions and quality of life.

It is known that the benefits of the practice of Qi Gong / Lian Gong on the quality of life and the physical capabilities of the western elderly people has not been well studied, so this study is aimed at comparing the physical capabilities and the quality of life between the elderly who practice Qi Gong / Lian Gong and those who do not in order to ascertain the benefits of practising it regularly.

**MATERIALS AND METHODS**

**Setting and Study population**

The study was observational, case-control and retrospective. The sample was non-probabilistic for convenience and composed of 89 women who participate in other activities within the public healthcare system in two cities (Campinas and Paulinia) in the State of São Paulo – Brazil. Data collection was carried out during the first half of 2013. First, all the women were classified as physically independent [12] in order to ensure non-dependency on other people or equipment in their daily routine. There were no restrictions related to the use of medicines.

The women were divided into two groups, the first one composed of 57 elderly persons that had been practising Lian Gong for six months or more and a second group of elderly persons who had not been practising Lian Gong, considered the control group, composed of 32 subjects.

In order to ensure that the practice of other physical activities would not interfere with the group of elderly persons practising Lian Gong, a questionnaire was used to ascertain whether the volunteers engaged in any other physical activities, whether these were taken into consideration by the authors of the study and the level of physical activity of each volunteer (Table 1).

The criteria for inclusion in the group practising Lian Gong was a practice of Lian Gong for six months or more and a Level 1 classification. Hence, the influence of other physical activities in the physical capabilities and in the perception of quality of life of the volunteers was excluded. For those not practising Lian Gong (control group), the eligibility criteria was that the volunteers were not practising Lian Gong and were classified as Level 1 (Table 1). For this purpose, locations where physical activities were not a differential were sought, such as literacy classes for young people and adults and handicraft workshops, besides being questioned about whether physical activities were engaged in or not.

Four Basic Healthcare Units (BHU) in the City of Campinas were selected for contacting elderly persons practising Lian Gong, all of them in the north zone of the city. All of these were invited to participate in the research at the place of their Lian Gong classes.

The elderly that were not practising physical activities were selected from day centres that do not offer physical activities in Campinas or Paulinia. All of the elderly persons signed an informed consent form (ICF) and the research had the approval of the Ethics Committee of the Faculty of Medical Sciences under protocol number CAAE 01576912.4.0000.5404.

### Physical capacity - Strength and Resistance

For the tests of physical capabilities a set of physical tests were performed [12], in which the strength and resistance of the lower limbs were evaluated through the test of sitting down and standing up, recording the number of complete standings done in 30 seconds with the arms crossed on the chest, from a 43cm-high chair. The strength and resistance in the upper limbs were evaluated by means of an elbow-flexing test in a sitting position, using a 2kg weight and noting the highest number of repetitions.

### Physical capacity - Flexibility

The flexibility of the lower limbs was evaluated by means of a test of sitting and reaching. The average in centimeters was measured, taking into consideration the distance from the tip of the middle finger to the tip of the toe. The measure can be positive (when the fingers do not reach the toes) or negative (when the fingers exceed the line of the toes). To measure the flexibility of the upper limbs, the test of joining the hands behind the back was applied and the distance between the fingers of both hands were measured in centimeters. As previously explained the measurements in this case can also be positive or negative, in the event that there was insufficient distance for the fingers to touch or if the volunteer managed to exceed the lines of the middle finger in each hand, respectively.

### Physical capacity - Agility

The test to evaluate the agility and the dynamic balance of the volunteers started with them sitting on a chair in an upright position, feet on the floor and the hands on their thighs. When asked, they should stand up, walk fast (not run) around a cone at a 2.44m distance from the chair and come back to the initial position. The time each person took to complete the test was noted.
Anthropometric Measures

Measurements of body mass and the given statures were used to calculate the Body Mass Index (BMI), with the score of 22±BMI±27 being considered as an adequate nutritional state [13].

The waist circumference (WC) and the measurement of the hip were used to complement the BMI due to its direct relation to the risk of morbidity/mortality. For this purpose, the lower measurement of the thorax circumference between the lower ribs and the upper part of the iliac crest was used, with the individual in the orthostatic position, with a relaxed abdomen, loose arms and feet apart up to the width of the hips. With the individual in this same position, the measurement of the hip was taken at the highest point, the gluteus region [14]. The measurement was done in centimeters.

The waist-hip-ratio (WHR) was obtained by dividing the waist circumference measurement by the hip measurement and then the risk of developing cardiovascular diseases in women was evaluated [15].

Quality of life

The perception of quality of life was evaluated using the questionnaire WHOQOL-bref [16] and the scores were verified in the domains as follows: Domain I – Physical, Domain II – Psychological, Domain III – Social relations and Domain IV – Environment and overall quality of life. The scores of quality of life vary between 4 to 20 points; the higher the score the better the perception of quality of life.

Statistical Analysis

The analyses of frequency and distribution of the data were done using the arithmetic average and the standard deviation. The data distribution was verified according to the Gauss curve (normality) with the Shapiro-Wilk test. For the comparison between the groups, the t-student test was used for the parametric variables (normal) and the Mann-Whitney test for the non-parametric variables, using a significance level of p<0.05. The data analyses of quality of life followed the recommendations of the WHO [17].

Any possible bias in the study is related to the variables of weight and height because these were self-reported by the volunteers. The agility test was conducted with guidance to prevent any possible reductions from influencing the test speed.

The practice of other physical activities was ascertained in order to exclude other physical activities that could be considered as confounding variables.

RESULTS AND DISCUSSION

Group practising Lian Gong and group control

The volunteers that took part in the research, practising and non-practising of Lian Gong, were 89 women over 60 years old who were classified in three levels of practice of physical activities (Table 2).

For this study 30 elderly persons practising Lian Gong were selected with Level 1 physical activities and 26 elderly persons for the control group (not practising Lian Gong, also Level 1).

Difference between the groups: Age, BMI and WHR

The data and the statistical analyses referring to the variables of age, BMI and the WHR showed a significant statistical difference between the groups for the variables of BMI and WHR, with the lower average values occurring in the group of elderly who practice Lian Gong (Table 3). In relation to the nutritional status, taking into consideration the Lipschitz criteria, the group practising Lian Gong was classified as eutrophics and the control group as overweight.

difference for the flexibility of the upper limbs with the group practising Lian Gong group having better flexibility (Table 4).

Difference between the groups: Physical capacity

The results of the comparisons between the variables of physical capability showed that there was a significant statistical difference for the flexibility of the upper limbs with the group practising Lian Gong had higher average values in almost all the domains (physical, psychological, environmental and overall).

Discussion

The BMI and the WHR must be used to monitor the risk of metabolic disorders and cardiovascular diseases [18], since an excess in body fat is strongly connected with the risk of death [19]. Our study showed that the elderly practising Lian Gong had better results with average values of BMI, being classified as eutrophics and the WHR showed that the elderly practising Lian Gong, despite being classified with a high risk of developing cardiovascular diseases, showed an average value lower than the

Table 2: Distribution of the elderly practising and non-practising Lian Gong according to their levels of physical activities, Campinas, SP, Brazil, 2012/2013.

<table>
<thead>
<tr>
<th>Level of Physical Activities</th>
<th>Practising</th>
<th>Not practising</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>30</td>
<td>26</td>
</tr>
<tr>
<td>Level 2</td>
<td>20</td>
<td>6</td>
</tr>
<tr>
<td>Level 3</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Differences between the variables of age, BMI and WHR of the elderly practising and not practising Lian Gong, Campinas, SP, Brazil, 2012/2013.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Age(years)</th>
<th>BMI (Kg/cm²)</th>
<th>WHR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practising (n=30)</td>
<td>67.8±7.30</td>
<td>26.50±4.57</td>
<td>0.88±0.06</td>
</tr>
<tr>
<td>Not practising (n=26)</td>
<td>67.4±6.90</td>
<td>29.79±6.03</td>
<td>0.92±0.04</td>
</tr>
<tr>
<td>p value</td>
<td>0.755**</td>
<td>0.030*</td>
<td>0.027**</td>
</tr>
</tbody>
</table>
| t test; "test Mann-Whitney
non-practising women. Another study with middle aged women also showed the benefits that the practice of Lian Gong has on the BMI when compared to a group of non-practising women [20].

Breathing, heartbeat, circulation, digestion and the general metabolism have also shown an influence of the practice of Lian Gong and have contributed to improvements in the physical and mental functions [21]. Thus, it seems the practice of Lian Gong contributes to lower anthropometric indicators and consequently to the preservation of health in practising women.

The Chinese therapeutic exercises have been cited as a way of improving social relations and the health of people who practice them [22]. In this context, we can emphasize that the practice of Lian Gong involves elements, such as the exchange of experiences and information about health promotion, between the monitors and practitioners and this is instrumental for changing living habits, mainly those focused on the regular practice of physical activities and the adoption of healthy eating behaviour [23].

This study showed a significant statistical difference for the flexibility of the upper limbs, with better average values found in the group practising Lian Gong. The study found that the practice of Lian Gong improved the flexibly of the elderly [24] and disagrees with the study that evaluated the flexibility and social relations in elderly people with the aim of improving the physical capabilities, mainly for the knee extensors and abdominal muscles [25].

When comparing our results for the physical capabilities with the standard scores of the American population [26], in the same age group, we observe that only the variable flexibly of the lower limbs of elderly women practising and those not practising Lian Gong reached the standardized average values, with all the other variables having lower values. It is worth mentioning that the Standardized Scores were determined based on the American population; therefore these results must be looked at with care.

Studies show that flexibility is one of the physical capabilities that should be developed in programmes for prevention of falls among elderly people [12,27], thus, in view of the results of the study, it seems that the practice of Lian Gong improves flexibility and can be used as a strategy to prevent falls.

Despite not having observed significant differences between the groups for the other physical capabilities, studies with Qi Gong and Tai Chi Chuan have shown positive results for the strength capability, mainly for the knee extensors and abdominal muscles [28,29] and improvement in agility and dynamic balance [30]. These considerations can be associated with having practiced Lian Gong over a longer period of time as reported in the studies and with the number of individuals in the sample in this study.

Regarding quality of life, the results showed that there was no significant difference between the groups. However, the average of the four domains showed higher values for women practising Lian Gong. Only the domain of social relationships showed a higher average for the control group, something that may be related to the origin of the sample individuals not practising Lian Gong. These volunteers belonged to a group of people in a centre for senior citizens and that may have contributed to this result.

Unfortunately, articles that relate Qi Gong and the perception of quality of life of the elderly are rare in Brazil. In a study on intervention in Switzerland, where they used the practice of Qi Gong, an improvement in the quality of life and a lower perception of headaches in middle aged women workers were observed [31].

Severall studies related to the improvement in the quality of life used the questionnaire SF-36 in people with morbidities and with the intervention of Tai Chi Chuan [32,33]. Because these studies involved people with morbidities, they ended up having physical activities as the rehabilitation therapy, being much more in favour the results, mainly those related to self-esteem and self-confidence after the intervention.

Thus, from a clinical point of view, Qi Gong, when practiced by the elderly in rehabilitation, has been shown to improve AVD, social relations and the quality of life in these individuals [21,34].

Therefore, our study, by not involving elderly women in rehabilitation, is instrumental in encouraging the practice of Lian Gong by all elderly people with the aim of improving the physical capabilities, mainly flexibility.

Table 4: Comparison between the physical capabilities of the elderly practising and those not practising Lian Gong, Campinas, SP, Brazil, 2012/2013.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Strength in the UL (n)</th>
<th>Strength in the LL (n)</th>
<th>Flexibility of the UL (cm)</th>
<th>Flexibility of the LL (cm)</th>
<th>Agility and Balance (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practising (n=30)</td>
<td>15.7±3.66</td>
<td>11.97±2.98</td>
<td>6.80±9.44</td>
<td>2.77±8.34</td>
<td>8.62±2.55</td>
</tr>
<tr>
<td>Not practising (n=26)</td>
<td>13.96±4.25</td>
<td>10.73±2.60</td>
<td>12.46±9.77</td>
<td>8.94±12.24</td>
<td>9.56±2.40</td>
</tr>
<tr>
<td>p value</td>
<td>0.163</td>
<td>0.123</td>
<td>0.033*</td>
<td>0.091</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Table 5: Comparison between the average scores of quality of life of the elderly practising and those not practising Lian Gong, Campinas, SP, Brazil, 2012/2013.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Physical</th>
<th>Psychological</th>
<th>Social Relations</th>
<th>Environmental</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practising (n=30)</td>
<td>14.42±2.96</td>
<td>15.11±2.55</td>
<td>14.79±3.96</td>
<td>13.37±2.65</td>
<td>15.18±2.84</td>
</tr>
<tr>
<td>Not practising (n=26)</td>
<td>13.83±2.64</td>
<td>14.92±1.83</td>
<td>15.14±2.05</td>
<td>12.69±2.29</td>
<td>14.92±1.86</td>
</tr>
<tr>
<td>p value</td>
<td>0.274**</td>
<td>0.375**</td>
<td>0.917**</td>
<td>0.333*</td>
<td>0.887**</td>
</tr>
</tbody>
</table>

*p test; **test Mann-Whitney.
CONCLUSION

In conclusion, the study confirmed that elderly people who practice Lian Gong have better flexibility in the upper limbs and better BMI and WHR values when compared to the elderly who do not practice Lian Gong. However, we emphasize that the sample size was small and we cannot affirm that the practice of Lian Gong was the cause of the observed changes, but proves to be a good intervention strategy for health promotion of communities.

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