Quality of life of rural menopausal women in response to a customized exercise programme

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Aim. This paper reports a study examining the effects of physical exercise on the quality of life of menopausal women.

Background. People who perform no type of physical activity have poorer physical and mental health. Despite the well-documented benefits of exercise, ageing women remain largely sedentary, and interventions designed to help them to maintain exercise programmes may prove particularly valuable. Measures should focus on increasing women’s confidence so that they can overcome barriers to exercise. Conflicting results have been reported in intervention studies to promote exercise in postmenopausal women.

Methods. Forty-eight menopausal women aged 55–72 years were recruited at a primary care centre as voluntary participants in a quasi-experimental study. They were randomly assigned to one of two groups: control (n = 24) and experimental (n = 24). The experimental group participated in a 12-month programme of cardiorespiratory, stretching, muscle-strengthening and relaxation exercises carried out during two fully supervised exercise sessions per week (total of 3 hours weekly). Health-related quality of life was assessed by using the Quality of Life Profile for Chronically Ill Patients, a generic questionnaire widely used in epidemiological and clinical studies to measure well-being and function, incorporating as an optional module the Kupperman Index of Menopausal Symptomatology.
Results. There was a statistically significant improvement in the health-related quality of life of the experimental group, whereas the health-related quality of life of the control group significantly worsened. Menopausal symptoms also significantly improved in the experimental group and significantly worsened in the control group over the 12-month study period.

Conclusions. A customized exercise programme is valuable for improving the health-related quality of life of menopausal women.

Keywords: menopause, nursing, physical activity, quality of life

Introduction

The ageing of the population especially affects women, whose life expectancy exceeds that of men by almost a decade. Menopause is characterized by major physical, psychological and social changes (Pansini et al. 1994, Punyahotra et al. 1997, Menditto et al. 1999, Brown 2001) and is currently considered an important public health problem associated with a worse health-related quality of life (HRQOL) (Delissa 1992, Kennet 1996, McKinlay et al. 1996, Barile 1997, Bayles et al. 2000). Postmenopausal women can be considered a risk population, although menopause itself is not considered a disease (Sulak 1996, INSALUD 1998).

Individuals who perform no type of physical activity have poorer physical and mental health (Brown 2001), with worse consequences for disability and mortality compared with those who carry out some programme of moderate physical activity (Unger & Jennifer 1995, Blair & Connelly 1996, Marcus et al. 1996, Pastor et al. 1998, Van de Putte 1998, Menditto et al. 1999). According to a recent report (Brooke-Wavell et al. 2001), menopausal woman who are physically active have a better postural stability than those who are not, with a reduced risk of falls and fractures.

Despite the well-documented benefits of exercise, ageing women remain largely sedentary, and interventions designed to help women in their 50s, 60s and 70s to maintain exercise programmes may prove particularly valuable (Conn et al. 2003a,b). It has been proposed that measures should focus on increasing women’s confidence so that they can overcome barriers to exercise (Conn et al. 2003a,b). Further understanding of the benefits associated with exercise could result in more effective public health interventions to increase exercise in this vulnerable population.

Physical exercise for therapeutic purposes is an important part of modern therapy of the locomotor system. Alongside pain therapy, it offers an increased capacity for physical performance in general and for the treatment of local functional disorders. The main purpose of prescribing exercise is to help individuals to increase their habitual level of physical activity. Specific objectives vary according to the particular needs, setting and health status (Rodriguez 1995).

Although there are few studies on HRQOL in menopausal women, different authors (Buendia Bermejo et al. 2001) agree that physical, psychological and social aspects must all be considered given the complexity of the changes occurring at this time. Damush and Damush (1999) reported on an 8-week resistance training programme utilizing elastic bands in 62 community-dwelling women with a mean age of 68 years. Pre- and postintervention assessments included strength tests and HRQOL. Results revealed significant increases in three major muscles compared with a control group. However, there were no significant changes in either mental or physical health functioning. The authors concluded that elastic bands provide older adult women with an inexpensive and practical exercise programme that effectively increases strength within 8 weeks but may have little effect on self-reported HRQOL. On the other hand, the authors of a recent study concluded that both the fitness level and quality of life of postmenopausal women could be improved by a regular and controlled exercise programme of 6 weeks duration (Teoman et al. 2004).

A recent study of a 12-week structured education and exercise programme given to a group of 40 to 60-year-old women demonstrated statistically significant effects on climacteric symptoms in terms of Kupperman Index and psychosomatic symptoms, especially paraesthesia and nervousness. The authors concluded that the programme was effective in alleviating climacteric symptoms (Ueda 2004).

Investigation of the effect of exercise training on heart rate variability (HRV) in postmenopausal women has been inconclusive. Recently, however, an 8-week programme of moderate aerobic exercise was found to increase HRV in sedentary postmenopausal women in a randomized controlled trial. This benefit was not influenced by the use of hormone replacement therapy (Jurca et al. 2004).
The study

Aim

The present study aimed to assess the menopausal symptomatic and HRQOL profile of a group of sedentary postmenopausal women before and after their participation in a therapeutic physical exercise programme in comparison with a control group with the same characteristics. The objective of the programme was to improve menopausal symptoms and consequently the physical and psychosocial health of these women, enhancing their quality of life.

Design

A quasi-experimental analytical design was used with a control and experimental group, performing pre- and post-treatment measurements. The sample type was non-probabilistic with random assignation of the participants to one of the two groups. The randomization was performed by tossing a coin.

Participants

The study population comprised 48 menopausal women from the Health Centre of Armilla, a town close to Granada city in southern Spain. Their age range was 55–72 years. They underwent a health examination by the general practitioner and nurse at the centre, including electrocardiogram, blood pressure (BP) measurement, routine blood and urine analyses and measurement of weight, height and body mass index (BMI). At the same session, they were asked whether they had undertaken any type of physical exercise in the previous 5 years, including going for walks for this purpose. Exclusion criteria were a history of severe health problems (from medical records), including fracture, specific drug treatment for osteoporosis and presentation of orthostatic hypertension, vertigo, dizziness or problems of balance.

No women were excluded, and the final study group of 48 women was randomly divided into two groups: the experimental group (n = 24), who participated in the programme and the control group (n = 24), who did not participate in the physical activity programme but took part in monthly meetings. The groups were assigned in the presence of all the women, with the commitment to include all of them in a similar programme after the end of the study period.

Experimental intervention

The experimental intervention consisted of a programme of therapeutic physical exercise designed to improve physical and psychological health and enhance HRQOL in its physical, psychological and social dimensions. During the monthly follow-up meetings for the control group, the nurse at the centre was responsible for recording the BP of these women and for detecting any changes related to the inclusion criteria that could introduce a bias into the study. No women were excluded from either group during the study period.

Measurements

The measuring instrument used to evaluate the HRQOL was the Profile of the Quality of Life of the Chronically Ill (PQLCI) (Siegrist et al. 1997, 2000, Fernández-López et al. 2001). This instrument has been used in various clinical and epidemiological studies to study the HRQOL of large samples of the general population and of patients with different chronic diseases, including hypertension, epilepsy, diabetes and rheumatic and cardiovascular diseases. The reliability (internal strength and test–retest reproducibility) of the PQLCI has been shown to be high for all its scales, with Cronbach’s alpha coefficients of 0·72–0·93 (a value ≥0·7 is regarded as satisfactory) for all except the social well-being scale, which has a slightly lower coefficient (Fernández-López et al. 1994, 1997). The PQLCI was administered to all participants at the beginning (Pretreatment Measurement) and end (Post-treatment Measurement) of the study period. The assessments were always performed at the health centre during normal office hours.

The PQLCI, which is self-administered, aims to measure the quality of life of both patients with chronic conditions and healthy individuals and is based on a multidimensional modular system. A central generic module assesses the physical, psychological and social dimensions of functioning and well-being, based on 40 Likert-type items. A disease-specific module, selected by the user, contains items on the symptoms and limitations of the target disease and/or its treatment (Kupperman et al. 1953, Ueda 2004). Finally, a group of four additional items are included to control for confusion factors that can affect HRQOL but are unrelated to the disease or treatment: social support from family or friendship circle, recent or past influential life events, acute problems in the previous week and sexual deterioration.

The generic module is composed of six scales. Scale I (Physical Functioning – physical/performance capacity) addresses physical and intellectual functional capacity in both private and working life, performance of intense work and capacity for concentration and meeting daily responsibilities. Scale II (Psychological Functioning – psychological/performance capacity) includes items related to relaxation,
quality of sleep, appetite and capacity for enjoyment and examines the extent to which daily setbacks and disappointments can be compensated for and the degree to which individuals are in a condition to improve their personal situation. Scale III (Positive State of Mind – psychological/well-being) gathers features of a positive state of mind, such as ability to pay attention, good mood, emotional balance and optimism. Scale IV (Negative State of Mind – psychological/well-being) gathers features of a negative state of mind, such as sadness, nervousness, irritability and feelings of threat or despair. Scale V (Social Functioning – social/performance capacity) addresses the ability to establish and maintain relationships and to communicate with others. Finally, Scale VI (Social Well-Being) explores social-emotional support experienced as proximity to others, the giving and receiving of help and the absence of feelings of loneliness and exclusion. According to the authors of the questionnaire, these aspects are of great importance in assessing the psychosocial situation of chronically ill patients.

The Kupperman Index (Kupperman et al. 1953, Ueda 2004) of Menopausal Symptomatology was selected as the disease-specific module. This index has been widely used to gather the most frequent symptoms of menopause and their intensity, categorized as light, moderate, severe or absent.

Data collection

The experimental group participated in a 12-month therapeutic physical exercise programme of cardiorespiratory, stretching, muscle-strengthening and relaxation exercises carried out during two fully supervised exercise sessions per week. The programme was directed by a physiotherapist at a moderate intensity (50–85% of maximum heart frequency), starting with 30-minute sessions and progressing to 60-minute sessions within a month. The sessions took place on 2 days per week. The lighting and temperature were controlled at every session.

The programme consisted of mixed activities based on aerobic resistance, strength resistance, flexibility and relaxation exercises. Music was used as a resource to improve motivation at all sessions. The intensity and progression of effort was individually controlled according to the physical and adaptive capacity of each participant (Wilmore 2001). Thus, before each session, there was a functional assessment of the articular mobility, flexibility, balance, co-ordination and cardiorespiratory strength and resistance of the experimental group members by the physiotherapist and nurse.

All the women in both groups completed the study, with an attendance rate of more than 90%.

Ethical considerations

The study was approved by the ethics committee of the health centre. All the women provided informed written consent to their voluntary participation in the study.

Data analysis

We used the PQLCI statistical package to prepare the Quality of Life Scale database and the SPSS package (version 11.0 for Windows; SPSS Inc., Chicago, IL, United States of America) for the statistical analysis. A descriptive analysis of population variables (age, educational level, years of menopause, marital status and main occupation, among others) was performed. Binominal distribution and chi-square tests (for variables with two or more than two categories respectively) were used to study qualitative variables. Differences between the two HRQOL measurements in the groups were analysed with Wilcoxon non-parametric tests because of the small sample size. Mann–Whitney and Kruskal–Wallis tests were employed to determine any statistically significant differences between variables.

Results

Characteristics of the postmenopausal women

Our series of postmenopausal women had a mean age of 60.56 ± 4.7 years (mean ± sb) (range 55–70 years), mean height of 156.72 ± 7.4 cm and mean weight of 70.14 ± 11.75 kg. The weight of 22.9% of the women was considered normal (BMI < 25), 38.5% were overweight (BMI of 25–30) and 37.5% were obese (BMI > 30). All women came from rural environments and lived in their family homes. They all reported undertaking no type of physical exercise in the previous 5 years. Most were married (77.1%), had no primary education (89.6%) and devoted the majority of their time to housework (93.8%); 60.4% of the sample had a history of menopause of more than 10 years. The menopause was natural (rather than surgically induced) in 72.9% of cases.

Menopausal symptomatology

The Kupperman Index score was transformed into a dichotomous variable representing moderate (1–35 points) or severe (> 35 points) menopausal symptomatology. After completing the exercise programme, the proportion of women with severe symptomatology decreased from 50% to 37.5% (P < 0.003) (Table 1), whereas the proportion of the control
group with severe symptomatology statistically significantly ($P < 0.01$) increased from 58.3% to 66.7% over the same time period.

**Health-related quality of life**

Table 2 shows the HRQOL of the study participants at the beginning and end of the study. The HRQOL of the control group was statistically significantly ($P < 0.004$) worse, whereas that of the experimental group was statistically significantly ($P < 0.0001$) improved after the intervention.

Table 3 shows the test–retest reliability obtained in our study. In the whole series (both groups), the Cronbach’s alpha coefficient for the PQLCI was 0.81 at the beginning of the study and 0.79 at the end, 1 year later. In the experimental group, the reliability was 0.64 at the beginning and 0.88 at the end, and in the control group these figures were 0.93 and 0.60.

Table 4 shows the means and standard deviations for the different PQLCI scales. The mean Physical Functioning Scale score was 1.64 at the beginning of the study and 1.80 at the end in the overall series. The experimental group showed a statistically significant increase on this scale from 1.90 at the start of the programme to 2.36 at the end, whereas the control group showed a decrease from 1.39 to 1.25 over the same time period. The mean Psychological Functioning Scale score was 2.02 in our overall series at the beginning of the study and 2.03 at the end. The mean experimental group score increased from 2.10 to 2.41 after the programme, whereas the control group score declined. In the overall series, the Positive State of Mind Scale score was 1.85 at the beginning of the study and 1.72 at the end. The mean value for this scale rose from 1.84 to 2.14 in the experimental group but fell from 1.86 to 1.30 in the control group. The mean Negative State of Mind Scale score was 2.42 at the beginning of the study and 2.28 at the end. The experimental group showed an increase from 2.53 to 2.78, whereas the control group showed a decrease from 2.30 to 1.77. In the overall series, the mean Social Functioning Scale score was 2.04 at the beginning of the study and 2.23 at the end. The experimental group showed an increase from 2.24 to 2.80 and the control group a decrease from 1.84 to 1.65. In the overall series, the mean Social Well-Being Scale score was 2.83 at the beginning of the study and 2.54 at the end. The experimental group showed an increase from 2.80 before to 2.91 after the exercise programme, whereas this value decreased markedly from 2.86 to 2.16 in the control group.

**Table 1 Menopausal symptomatology (Kupperman Index)**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pretreatment</th>
<th>Post-treatment</th>
<th>$P$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control ($n = 24$)</td>
<td>58.3</td>
<td>66.7</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Experimental ($n = 24$)</td>
<td>50</td>
<td>37</td>
<td>&lt;0.003</td>
</tr>
</tbody>
</table>

**Table 2 Health-related quality of life (HRQOL) measured by Profile of the Quality of Life of the Chronically Ill at beginning and end of the study**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pretreatment</th>
<th>Post-treatment</th>
<th>Statistical significance ($P$ value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control ($n = 24$)</td>
<td>14.12</td>
<td>11.96</td>
<td>&lt;0.004</td>
</tr>
<tr>
<td>Experimental ($n = 24$)</td>
<td>16.58</td>
<td>18.58</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Control – Experimental ($P$ value)</td>
<td>&lt;0.01</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
</tbody>
</table>

**Table 3 Reliability of Profile of the Quality of Life of the Chronically Ill scales in the study of menopausal women**

<table>
<thead>
<tr>
<th>Cronbach’s alpha coefficient</th>
<th>Total score</th>
<th>Scales</th>
<th>Pretreatment</th>
<th>Post-treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretreatment</td>
<td></td>
<td>Pretreatment</td>
<td>Post-treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I II III IV V VI</td>
<td>I II III IV V VI</td>
<td></td>
</tr>
<tr>
<td>Experimental group ($n = 24$)</td>
<td>0.64</td>
<td>0.88</td>
<td>0.81 0.75 0.86 0.83 0.75 0.59</td>
<td>0.69 0.82 0.84 0.72 0.87 0.70</td>
</tr>
<tr>
<td>Control group ($n = 24$)</td>
<td>0.93</td>
<td>0.60</td>
<td>0.67 0.78 0.77 0.77 0.82 0.67</td>
<td>0.62 0.47 0.79 0.86 0.63 0.75</td>
</tr>
<tr>
<td>Total sample ($n = 48$)</td>
<td>0.81</td>
<td>0.79</td>
<td>0.87 0.78 0.81 0.81 0.63 0.23</td>
<td>0.52 0.67 0.85 0.86 0.85 0.75</td>
</tr>
</tbody>
</table>

I, physical functioning; II, psychological functioning; III, positive state of mind; IV, negative state of mind; V, social functioning; VI, social well-being.

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Discussion

The main findings of this study were that a 12-month programme of exercise sessions held twice weekly improved the menopausal symptoms and HRQOL of menopausal women, whereas a control group of menopausal women who did not participate in the programme showed a worsening of symptoms and HRQOL.

The sensitivity of the instrument in detecting changes in the HRQOL of menopausal women over time was adequate ($\alpha = 0.74$ for the whole questionnaire and $0.69-0.87$ for the scales). These results are consistent with longitudinal studies of interventions and life events in other populations (Fernández-López et al. 1994, 1999, Herrador Aguirre 1999). A possible weakness of the multidimensional assessment of HRQOL is that it does not offer a uniform measure to evaluate the improvement or worsening of well-being and capacity for action. On the other hand, it has the advantage of approaching the reality lived by the patients, yielding more individualized information. The authors of the PQLCI Scale (Siegrist et al. 1997) claimed that an improvement (or worsening) in quality of life can be interpreted when positive (or negative) changes are observed in at least four of the scales and are statistically significant in at least two of them, except in extreme cases of improvement and worsening. Our study showed statistically significant differences in HRQOL between the beginning and the end of the study in both the experimental and control groups. A positive change was observed in all scales for the experimental group and a negative change in all scales for the controls, despite the small sample size.

The manual of the PQLCI (Siegrist et al. 1997) reports the mean scores obtained for each scale of the instrument in eight studies conducted in Germany, Spain and Russia, referred to here as the mean of other studies. The scores for the Physical Functioning Scale were lower in the present series, consistent with the results of other studies of menopausal women (Ferrán et al. 1997). The Psychological Functioning Scale score was also generally low in our series, which can be interpreted as a loss of self-esteem and ability to confront losses at this stage of life, consistent with previous findings of symptoms of depression or anxiety in menopausal women and of aggravation of these symptoms where they already existed (Brown 2001). Thus, there was a reduction in positive state of mind in the controls, whereas the positive state of mind of the experimental group was reinforced. This may be explained by improvements in menopausal symptoms and other benefits obtained from the physical exercise programme.

The experimental group showed an increase in the Social Functioning Scale score to above the values reported by most of the other studies considered, whereas this value decreased to 1.65 in the control group, indicating the importance of this type of physical exercise programme for social relationships in this subpopulation. The improvement in Social Well-Being score points to the value of group physical exercise activities for social relationships and as a resource for interventions to reduce loneliness.

This type of therapeutic physical exercise programme requires a small group of participants. It represents a basic support for health promotion or rehabilitation as well as improving psychosocial aspects.


Table 4 Means and standard deviations for the Profile of the Quality of Life of the Chronically Ill scales at the beginning and end of the study in this series of menopausal woman

<table>
<thead>
<tr>
<th>Scales</th>
<th>Pretreatment</th>
<th>Post-treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td>Total ($n = 48$)</td>
<td>Mean</td>
<td>1.64</td>
</tr>
<tr>
<td></td>
<td>$\sigma$</td>
<td>0.79</td>
</tr>
<tr>
<td>Experimental ($n = 24$)</td>
<td>Mean</td>
<td>1.90</td>
</tr>
<tr>
<td></td>
<td>$\sigma$</td>
<td>0.79</td>
</tr>
<tr>
<td>Control ($n = 24$)</td>
<td>Mean</td>
<td>1.39</td>
</tr>
<tr>
<td></td>
<td>$\sigma$</td>
<td>0.72</td>
</tr>
</tbody>
</table>

I, physical functioning; II, psychological functioning; III, positive state of mind; IV, negative state of mind; V, social functioning; VI, social well-being (scale IV was recoded, allowing interpretation of the scale in the same direction).
What is already known about this topic

- Physical exercise for therapeutic purposes is an important part of modern therapy of the locomotor system.
- Individuals who perform no type of physical activity have poorer physical and mental health and quality of life.

What this paper adds

- Regular physical activity improves menopausal symptoms and the quality of life of postmenopausal women.
- Specific programmes for postmenopausal women have a place in primary health care.
- Controlled physical exercise should be included in healthcare programmes for menopausal women.

Cobbs & Ralapati (1998). Numerous studies have suggested the need to influence lifestyles in the interest of extending life expectancy and improving health (Ferrán et al. 1997). Some authors have reported that age has a lesser influence on health than is generally imagined (Wilmore 2001). On the other hand, the passage of years is associated with a decreasing performance of physical exercise, especially in the case of older women (Rieu 1995).

Our results are consistent with reports by other authors (Rodriguez 1995, Ready et al. 1996, Dreyer et al. 1997, Karnoven 1999) that physical activity is associated with physical, psychological and social health and has a positive impact on HRQOL (Anita et al. 1991). Other studies have found that menopausal women can benefit from physical exercise, which attenuates the effects of the physiological changes associated with menopause and prevents pathological alterations (Ueda 2004) as well as having a positive impact on quality of life (Teoman et al. 2004).

Various studies conducted under similar conditions to those of the present work indicated that most of the benefits result from an increase in muscular strength, co-ordination and flexibility associated with rehabilitation programmes (Taunton et al. 1997, Aguilar et al. 1999, Damush & Damush 1999, Hough 2000, Olazábal Ulacia et al. 2000). However, further research is warranted to explore the relative contributions to this improvement of the exercise itself and the social relationships these programmes develop.

Conclusion

Our results showed a statistically significant improvement in the well-being of menopausal women who participated in a 1-year therapeutic physical exercise programme and a loss of well-being over 1 year in menopausal women who did not perform physical exercise.

According to these results, a physical programme designed for therapeutic purposes is a valuable instrument for improving the HRQOL of menopausal women and should be part of the social and health care offered to these women in the primary healthcare setting. Nurses can offer such a programme, thereby making a valuable contribution to improving women’s health in the community.

Acknowledgements

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Author contributions

CV-G performed the study conception and design, drafted the manuscript and supervised. EA and WB performed the data collection and analysis. FC and CV-G provided critical revision. JMR provided statistical expertise. GR-V provided administrative, technical and material support.

References


Issues and innovations in nursing practice


Menopausal women: exercise and quality of life