

Habitual Physical Activity and Quality of Life of Middle-aged Women



Adriana Coutinho de Azevedo
Guimarães¹

Fátima Baptista²

1. Physical Education Department,
Center of Health and Sports
Sciences, State University of Santa
Catarina, Brazil.

2. Laboratory Exercise and Health,
Faculty of Human Movement
Technical University of Lisbon,
Portugal.

Mailing address:

Rua Bias Peixoto, 187, apto.201

Itaguaçu II - 88085-480 -

Florianópolis, SC, Brazil.

E-mails: nanacefid@hotmail.com;

nanaguim@terra.com.br

fbaptista@fmh.utl.pt

ABSTRACT

Objective: To assess associations between of regular physical activity (PA) and quality of life (QL) in middle age women. **Methods:** 1011 female subjects, aged 45-59, took part in the research, considering 370 peri-menopausal and 641 post-menopausal, within the body mass index (BMI) 25 ± 4 kg/m² and schooling average 1-13 years. The QL was evaluated by the WHOQOL, and the PA through the International Physical Activity Questionnaire. **Results:** After dividing the sample into three groups according to the practice of total PA (A: <30 min/day; B: 30-60 min/day, C: > 60 min/day), analysis of variance adjusted for BMI and menopausal status (peri vs. postmenopause) showed differences in QL between groups A, B and group C in the physical domain and between group A and group B, C in psychological, social and environmental domains ($p \leq 0.001$). **Conclusion:** The accumulation of 30 min/day of total PA seems to be associated with more favorable effects on the psychological, social and environmental domains; however, it seems that at least 60 min/day are necessary to act on the physical domain. Nevertheless, such associations may reflect the impact of QL in the total amount of PA. Thus, the PA practice 30 min/day may be more conditioned by the psychological, social and environmental domains while the practice of 60 min/day by the physical domain.

Keywords: physical activity, women, perimenopause, postmenopause.

INTRODUCTION

The middle-age suits 40-59 year-old⁽¹⁾ people considered critical especially in women, due to their biological transformation determined by menopause⁽²⁻⁴⁾. Such transformation starts at the age of 39-51 years for 95% of the women (the average transition age for perimenopause – 46 years) and it derived from the depletion of the ovarian follicles (or the removal of ovaries, in the case of surgical menopause)⁽⁵⁾. It is generally a period of time followed by physical symptoms, some of which specific to menopause such as heat flows and sexual difficulties due to vaginal dryness and other general symptoms such as fatigue, headaches and insomnia, which affect 96% of the women. In that period, psychological symptoms such as depression, anxiety and irritability as well as concentration decrease are also present in 63% of the cases⁽⁶⁾. These symptoms have a mean duration of five years (for 95% of the women 2-8 years)⁽⁷⁾.

Besides the symptomatologic characteristic of the perimenopausal transition, at this age other changes deriving from psychosocial condition may equally appear. Loss, drifting or family separation and couples, independence and children moving out, professional career and stability, aging in a society which values beauty and youth, as well as manifestation of chronic diseases are cases demanding emotional adjustments^(5,8). As a whole, those changes frequently lead to depression, anxiety crisis, chronic stress, as well as low self-esteem and self-image⁽⁹⁾.

Despite the potential onset of negative events at middle-age, such life cycle period is also associated to autonomy conquest and decision power, to professional fulfillment, to personal development, maturation and broadening of perspectives for the future⁽¹⁰⁾. However, for many women the middle age is a vulner-

able period followed by a decrease in quality of life in the physical and psychological domains compared to men at the same age⁽¹¹⁾ or to young adult women^(5,10,12-16), and by a decrease in quality of life in the psychological and social domains compared to elderly women⁽¹⁷⁾.

Physical exercise seems to favorably influence quality of life concerning health, regardless of age and gender^(11,18-21). In the middle age, aerobic programs of at least moderate intensity, 30 minutes.

Per day, three to five times a week, within 12 months, reveal benefits in the general quality of life⁽²²⁻²⁴⁾ and especially in the psychological domain, showing a decrease of depression and anxiety^(25,26). This investigations studied the influence of physical exercise in the general quality of life; nevertheless, little information is available on the specificity of their effects in the several domains of health-related quality of life. This is a relevant aspect, since different quantities and/or intensities of physical exercise may directly influence the many domains of quality of life. On the other hand, the recommendation for physical activity practice in the public health scenario considers weekly accumulation of physical activity (150 min of at least moderate intensity) and not only formal exercise⁽²⁷⁾, and it is necessary to analyze the relation between this recommendation and the quality of life of middle age women, since this recommendation is based on epidemiological associations between self-reported physical activity and cardiovascular health or general health⁽²⁷⁻²⁹⁾. In this context, the main goal of the present study was to analyze associations between the quantity and intensity of habitual physical activity and the many health-related quality of life domains in middle age women.

METHODS

Subjects

The calculation of the sample size was based on the population of women aged 45-59 years in the city of Florianópolis, Santa Catarina, Brazil, according to the last census from the Brazilian Institute of Geography and Statistics⁽³⁰⁾, with a 5% acceptable error. Thus, 1,011 women were included in the study (for a minimum sample size of 1,000 women), set in two groups according to the reproductive function, namely one group with perimenopausal women ($n = 370$) and another group with one postmenopausal women ($n = 641$). The participants were invited to a voluntary participation in the study, by hiring or outsourcing institutions from the educational, health, sports, religious and insurance fields.

All the subjects were informed on the aims and procedures of the study and signed the Free and Clarified Consent Form (TCLE) according to the CNS Legal Resolution 196/96. This transversal study took place between December, 2007 and March, 2009 after having been approved by the Ethics in Research Committee of the State University of Santa Catarina.

PROCEDURES

Condition (perimenopausal vs. postmenopausal)

Each participant was argued on how long they have not had their menstruation. The women in one to 11 months of amenorrhea were classified in perimenopause, and the women

in 12 months or more of amenorrhea were classified in postmenopause⁽³¹⁾. Concerning menopause occurrence (natural or surgical), 18% of the women had surgical menopause, characterized by the removal of the two ovaries. Menopause age

in this study was calculated only with women who had natural menopause. Minimum age of occurrence of natural menopause was 37 years and maximum was 57 years, and average 45.4 ± 3.5 years of age.

Physical Activity

Physical activity was assessed through the international questionnaire of physical activity (IPAQ – short version); designed by researchers from many countries with support from the World Health Organization (WHO), as part of a multicenter study involving 12 countries. Each participant country adapted and validated the questionnaire according to the characteristics of the respective population. In Brazil, this questionnaire was validated by the Study Center of the Laboratory of Physical Aptitude of São Caetano do Sul – CELAFISCS, which is the coordinating center of the IPAQ in Brazil⁽³²⁾. In the assessment of the regular physical activity through the IPAQ, the number of times in which an individual performed at least 10 continuous minutes of walking, physical activity of moderate intensity and vigorous intensity in the last week was quantified, in many contexts, namely: occupational domestic, leisure, recreational and sports. Since a demand level of 3.3 METs, that is to say, a level higher than the cohort value for moderate physical activity (3 METs) is attributed to walking, the total physical activity, which results from the sum of walking, moderate physical activity and vigorous physical activity, corresponds to an activity of at least moderate intensity.

Quality of Life

Quality of life was assessed through the questionnaire abbreviated as World Health Organization Quality of Life (WHOQOL) which is adapted for Brazilian Portuguese⁽³³⁾. This questionnaire is composed of 26 questions (out of the 100 original ones), with 24 questions including the physical domain (physical pain, energy, locomotion, daily life activities, medical treatment, work), psychological (positive feelings, concentration, self-esteem, self-image, negative feelings, spirituality), social (personal relations, social support, sexual activity) and environment (physical safety, housing, financial resources, health, information, leisure, physical environment and transportation services) and two other general questions on quality of life.

The questions, which refer to the two last weeks, were designed for a response scale of the Likert kind, expressed through an intensity scale (null – extremely), or capacity (null – completely), or frequency (null – always), or evaluation (very unsatisfied – very satisfied; very bad – very good), in which the values are recorded in scores varying from 0 (terrible), 25 (average), 50 (good) 75 (very good) to 100% (excellent).

The body mass, stature, body mass index (weight (kg)/height (m)²), schooling years, health status and hormone replacement therapy were assessed through a self-applied questionnaire.

Data analysis

Statistics analysis was carried out through the SPSS – version 16.0. The comparison of the participants' characteristics (age, body mass index and schooling), of the quality of life and the physical activity between the peri and postmenopausal women was performed through the T test for independent samples and the comparison of the health and hormone replacement through the chi-square test. The associations between physical activity (walking, moderate physical activity, vigorous physical activity, moderate plus vigorous physical activity, and total physical activity) and the quality of life (physical domain, psychological domain, social domain and environmental domain) were analyzed through partial correlations adjusted to the condition (peri vs. postmenopausal). After the analysis, the physical activity variable which best related to several quality of life domains was selected in order to divide the total sample into three groups: A) < 30 min/day; B) 30-60 min/day; C) > 60 min/day). These three groups were compared through the ANCOVA adjusted to the condition (peri vs. postmenopausal) and, in case of significant differences among groups, through the Bonferroni post-hoc test. Due to the sample size, significance level was set as $p < 0.01$.

RESULTS

Table 1 presents the sample characterization, specifically, chronological age, menarche age, menopause age, as well as weight, height, schooling years, diseases and percentage of participants with hormone replacement therapy. The post-menopause women were older, presented higher prevalence of disease and made greater use of hormone replacement therapy. In the remaining variables, differences between groups have not been observed. Considering the total sample, within the menarche onset of age 12.8 years and of menopause was 45.4 years (minimum age 37 years and maximum age 57 years). Schooling was 10.5 years, showing the majority of the women studied up to high school. Mean body mass index was 25,2 kg/m², revealing

Table 1. Characteristics of the participants of the study (mean ± standard deviation).

	n	Total	Peri M	Post M	P value
Chronological age (years)	1.011	49.5 ± 5.1	45.3 ± 2.8	52.0 ± 4.5	< 0.001
Menarche age (years)	986	12.8 ± 1.7	12.7 ± 1.5	12.9 ± 1.8	0.051
Menopause age (years)	634	-	-	45.4 ± 3.5	-
Body mass (kg)	1.011	65.2 ± 11.0	65.3 ± 10.8	65.2 ± 11.1	0.812
Stature (m)	1.011	1.60 ± 0.06	1.61 ± 0.06	1.60 ± 0.06	0.032
Body mass index	1.011	25.2 ± 4.0	25.1 ± 3.9	25.3 ± 4.0	0.431
Schooling (years)	1.010	10.5 ± 3.1	10.8 ± 3.1	10.4 ± 3.1	0.097
Diseases (%)	1.010				< 0.001
No disease		58.2	67.3	53.0	
Two diseases		26.1	22.7	28.2	
Two diseases		10.2	6.4	12.4	
Three or more diseases		5.2	3.5	6.2	
Hormone replacement (%)	1.005	21.1	10.9	26.9	< 0.001

Peri M = perimenopause; Post M = post-menopause; n = number of participants who replied to the questions corresponding to each variable, except for menopause age where n expresses the number of participants in menopause.

excess body weight. Approximately 21% of the women made use of hormone replacement therapy for a period longer than five years. The results of the health-related quality of life reached between 59-61% in the physical and psychological domains and between 67-69% in the environmental and social domains, respectively, considering the total sample (Table 2). Differences in the quality of life have not been observed between the groups of peri and postmenopausal women.

Table 3 presents the results concerning physical activity described by the time spent in the walking, physical activity of moderate intensity, of moderate plus vigorous intensity and total physical activity. Differences in physical activity between the groups have not been observed, except for the vigorous activity in which the postmenopausal women reported daily values higher than the perimenopausal women. Generally speaking, the participants of this research adopted walking as physical activity choice and walked mean time of 48 minutes per day. Concerning the total physical activity, it was observed that the values reported are much above the recommendation for the adult population; that is to say, a mean of 90 minutes a day (walking + moderate + vigorous). Since the differences in quality of life and

physical activity between the peri and postmenopausal women were almost inexistent, the analysis of the associations between quality of life and physical activity was performed considering the total sample, adjusting this analysis to the menopausal condition (Table 4). Generally, the results revealed positive associations between domains of quality of life and moderate intensity, vigorous intensity, moderate plus vigorous intensity and total physical activity ($p < 0.01$). Associations between quality of life and walking have not been identified.

Table 2. Comparison of the quality of life between the peri and post-menopausal women groups (mean ± standard deviation).

	n	Total	Peri M	Post M	P value
Physical domain (%)	999	59 ± 14	58 ± 15	59 ± 13	0.197
Psychological domain (%)	1.007	61 ± 12	61 ± 13	61 ± 12	0.841
Social domain (%)	1.009	69 ± 20	68 ± 21	70 ± 20	0.226
Environmental domain (%)	1.011	67 ± 16	66 ± 16	70 ± 16	0.414

Peri M = perimenopause; Post M = post-menopause; n = number of participants who replied to the questions corresponding to each variable.

Table 3. Comparison of the physical activity between the peri and post-menopausal women groups (mean ± standard deviation).

	n	Total	Peri M	Post M	P value
Walking (min/d)	994	48 ± 43	46 ± 40	50 ± 45	0.284
Moderate PA (min/d)	995	28 ± 40	29 ± 40	27 ± 39	0.420
Vigorous PA (min/d)	995	15 ± 32	12 ± 30	16 ± 34	0.009
Mod PA + Vig PA (min/d)	995	43 ± 56	41 ± 52	44 ± 58	0.941
Total PA (min/d)	994	90 ± 75	87 ± 68	93 ± 78	0.508

Peri M = perimenopause; Post M = post-menopause; PA = physical activity; Mod + Vig = moderate + vigorous; n = number of participants who replied to the questions corresponding to each variable.

Table 4. Partial correlations between physical activity and quality of life of midlife women.

	Walking	Mod PA	Vig PA	Mod+Vig PA	Total PA
Physical domain (%)	0.067	0.086*	0.109*	0.126*	0.132*
Psychological domain (%)	0.079	0.078*	0.086*	0.107*	0.124*
Social domain (%)	0.052	0.083*	0.096*	0.116*	0.116*
Environmental domain (%)	0.040	0.105*	0.051	0.105*	0.101*

PA = physical activity; Mod = moderate; Vig = vigorous; * $p < 0.01$. Partial correlations adjusted to the menopausal condition (peri vs. post-menopause)

When the sample was divided into three groups according to the total habitual physical activity practice (A: < 30 min/day; B: 30-60 min/day; C: > 60 min/day) adjusted to the menopausal condition (peri vs. postmenopausal), it was observed longer time of total habitual physical activity in the women who presented higher quality of life scores in the psychological, social and environmental domains than in women who practiced less physical activity (< 30 min/day) ($p \leq 0.001$) (Table 5). Regarding the physical domain, the women with total

physical daily practice above 60 minutes demonstrated higher values of quality of life compared to the ones who did not practice this amount ($p < 0.001$).

Table 5. Comparison of the quality of life according to the total physical activity practice of midlife women.

	A	B	C	P value	Post-hoc
	< 30 min/d	30-60 min/d	> 60 min/d		
Physical domain (%)	57 ± 0.7	58 ± 0.7	60 ± 0.5	< 0.001	A,B<C
Psychological domain (%)	58 ± 0.7	61 ± 0.7	63 ± 0.5	< 0.001	A<B,C
Social domain (%)	65 ± 1.3	69 ± 1.2	72 ± 0.9	0.001	A<B,C
Environmental domain (%)	63 ± 1.0	67 ± 0.9	68 ± 0.7	0.001	A<B,C

ANCOVA adjusted to the menopausal condition (peri vs. post-menopause).

DISCUSSION

The main goal of this study was to analyse associations between intensity and quantity of habitual physical activity and the many health-related quality of life domains in midlife women. The results indicate that total physical activity practice of 30 min/day may be associated to more favorable characteristics at the psychological, social and environmental levels; however, a minimum of 60 min/day seem to be necessary for additional effects at the physical level.

Total physical activity quantified by the IPAQ considers only physical activity with minimum demand level of 3.3 METs (walking) and, consequently, total physical activity is concerned with physical activity of at least moderate intensity. Thus, it can be stated that the public health recommendation for physical activity may not be sufficient to influence the physical domain of quality of life. Nevertheless, such results may reflect the differentiated influence of many quality of life domains in the habitual physical activity. In that case, the practice of a smaller amount of physical activity of at least moderate intensity, specifically 30 min/day, seems to be more conditioned by psychological, social or environmental factors, while accumulation above 60 min/day seems to be determined by physical factors. Among these factors, pain, fatigue and insomnia (physical domain), self-esteem and self-image (psychological domain), as well as financial resources, physical environment and transportation (environmental domain) have been told as being the most determining of lower or higher physical activity practice^(34,35).

Although many transversal or intervention investigations describe an association/influence of physical activity/exercise in the quality of life in the physical and psychological domains, its quantity and intensity have not been object of assessment^(22,23,25,36,37). On the other hand, investigations which relate physical activity and quality of life in the social and environmental domains are almost inexistent, except for Mirzaiinj Mabadi et al.⁽³⁸⁾, who observed improvement of quality of life at the sexual level (social domain) in women aged 45-60 years.

As in some other studies, the total physical activity seems to contribute to health-related quality of life in middle age women^(26,39), despite the variation of any quality of life domain explained by physical activity being lower than 2%. Even though, sufficient levels of physical activity seem to provide lower number of unhealthy days⁽³⁹⁾.

The participants of this study demonstrated good quality of life, with mean scores (~60-70%) similar to the ones observed in other investigations with the same kind of population^(14,16,25,40-42). However, differences in quality of life among peri and postmenopausal women have not been observed as in other studies^(13,14,43). In these studies, the main differences reported were associated with hot flashes, insomnia and muscle pain⁽¹⁴⁾, physical inactivity⁽⁴³⁾ and stress⁽¹³⁾.

In the present study, the prevalence of women sufficiently active in a health perspective was 63% in the premenopausal women and 65% in the postmenopausal women. These prevalence values are similar to the ones observed in Brazil in 2003, in women aged 40-65 years (62%) through the IPAQ in a sample of 511 women 18-65 years from São Paulo⁽⁴⁴⁾. Additionally, the total regular physical activity practice within ~90 minutes a day, the triple of the recommendation for adult subjects (30 min/day), showed no difference according to the phase of the biological cycle (peri vs. postmenopausal). The high quantity of physical activity reported by these women may be justified by the fact that the IPAQ assesses the physical activity in many contexts, including professional, domestic and transportation, and is not limited to leisure activities. In developing countries such as Brazil, the occupational and transportation activities⁽⁴⁵⁾, as well as domestic tasks, represent a significant part of the total activity of middle age women. In fact, in adulthood, it seems that the life period in which the highest prevalence of physical activity in women is observed is 40-49 years⁽⁴⁶⁾, despite the formal practice of exercise being able to be higher in postmenopausal women than in the pre-menopausal ones^(25,47).

CONCLUSION

It can be concluded that a 30 min/day practice of physical activity of at least moderate intensity can be associated with more favorable effects at the psychological, social and environmental levels; however, a minimum of 60 min/day are necessary for significant effect at the physical level. Nevertheless, these associations can reflect the impact of quality of life in the total amount of physical activity. Thus, practice of 30 min/day seems to be more conditioned by psychological, social and environmental domains, while 60 min/day by the physical domain.

All authors have declared there is not any potential conflict of interests concerning this article.

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