Quality of life in the elderly in a stretching program

Qualidade de vida em idosos em um programa de alongamento

Calidad de vida en adultos mayores en un programa de estiramiento

Geovana Mellisa Castrezana Anacleto
Rita de Cássia de Aquino
Flávio Rebustini

BSTRACT: The aim was to evaluate the quality of life of the elderly before and after the intervention. Twenty-one elderly (mean 65.71 years, ± 5.08) participated in a stretching program and WHOQOL-Bref and WHOQOL-Old were used for evaluation. The four dimensions of WHOQOL-Bref showed improvement in indicators, as well as the dimensions of WHOQOL-Old: Past, Present and Future Activities, Social Participation, and Intimacy. It is concluded that there is evidence that stretching type physical activity seems to be beneficial for the studied population.

Keywords: Exercise; Stretching; Elderly.

RESUMO: *Objetivou-se avaliar a qualidade de vida de idosos pré- e pós-intervenção. Participaram 21 idosos (média 65,71anos, ±5,08), de um programa de alongamento e, para avaliação, foi utilizado o WHOQOL-Bref e WHOQOL-Old. As quatro dimensões do WHOQOL-Bref apresentaram melhoria dos indicadores, como também as dimensões do WHOQOL-Old: Atividades Passadas, Presentes e Futuras, Participação Social e Intimidade. Conclui-se que há evidência de que a atividade física do tipo alongamento parece ser benéfica para a população estudada.*

Palavras-chave: *Exercício Físico; Alongamento; Envelhecimento.*

RESUMEN: *El objetivo fue evaluar la calidad de vida de los ancianos antes y después de la intervención. Veintiún ancianos (media de 65,71 años, ± 5,08) participaron en un programa de estiramiento y WHOQOL-Bref y WHOQOL-Old se utilizaron para la evaluación. Las cuatro dimensiones de WHOQOL-Bref mostraron mejoras en los indicadores, así como las dimensiones de WHOQOL-Viejo: Actividades pasadas, presentes y futuras, Participación social e Intimidad. Se concluye que existe evidencia de que la actividad física de estiramiento parece ser beneficiosa para la población estudiada.*

Palabras clave: *Ejercicio; Estiramiento; Mayores.*

Introduction

Aging is growing in the world and in Brazil. Kalache, Veras, & Ramos (1987) estimates that, by 2025, the Brazil will be the 6th country with approximately 33 million people in this age group. It should be noted that in the 80 Brazil was the 16th country in the number of elderly people. The 2010 demographic census (IBGE, 2010, 2013) showed that the elderly population was quantified at 11,849,450. In 2016, this total increased to 16,871,719, that means, 8.17% of the total population, and estimates indicate that in 2025 it will reach 11,30% of the population in 2025.

According to the WHO (2015), World Health Organization, the pace of population aging in many countries is also much higher than in the past. France took almost 150 years to accommodate the increase of 10% to 20% in the proportion of population over 60 years. In contrast, countries such as Brazil, China and India will have little more than 20 years to make the same adjustment, representing an impact in public management and the profile of the population.

Aging can be conceptualized as a progressive and dynamic process, in which has morphological modifications, functional, biochemical and psychological, which determine loss of individual capacity to adapt to the environment, leading to greater vulnerability and higher incidence of pathological process (Papaléo Netto, & Pontes, 1996), being a universal phenomenon, both in developed countries as well as in undeveloped countries.

According to the WHO (2015), aging results in complex changes to the individual, in biological aspects is associated with an accumulation of cellular damage and molecular changes that, over time, gradually reduce the physiological reserves, increase the risk of diseases and decreasing the individual's overall ability, finally resulting in death.

However, aging can occur in a healthy way. WHO (2015, p.30) defines Healthy Aging "as the promotion and maintenance process of functional capacity that allows one to be in old age" and states that "the functional capacity is related to the health that allows a person to be, and to do, what is important to them".

With a better physical capacity, the elderly people can have a better understanding of their quality of life. The WHOQOL, 1994, the World Health Organization's Quality of Life, defined quality of life as the "individual's perception of their position in life, in the context of culture, and the system of values in which they live, in relation to its objectives, expectations, standards and concerns". The WHOQOL was developed it in three areas of foundation: first level - the subjective perception of an objective condition (for example, the perception of the adequacy of a social situation); second level – it's related to the subjective global perception of functioning (for example, if the individual sleeps well); and finally, the third level - specific assessment of subjective perception (for example, if the individual is satisfied with his sleep).

Quality of life is also related to individual and social experiences and values, with the search for comfort and well-being, varying with time, values, spaces and different histories.

It is influenced by factors that are characteristic of the human essence, highlighting the non-material values such as love, freedom, happiness, solidarity, personal achievement and social insertion (Campos, Cordeiro, Rezende, Vargas, & Ferreira, 2014).

Within this context, the physical activity is an important tool for promotion and maintenance of the functional capacity of the elderly and their quality of life.

Nobrega, *et al.* (1999) reported that the practice of physical activity is recommended not to only maintain or improve the bone mineral density of the elderly people but also to prevent bone loss.

They also discussed the many benefits of the practice: it regulates the improvement of strength, muscle mass and joint flexibility; increase of the maximum VO2; benefits peripheral circulatory; improvement in the blood glucose and lipid profile; general reduction of body weight; blood pressure control; improvement of lung function; smaller dependency to perform activities of daily living (ADL); improvement in self-esteem and self-confidence; improvement in quality of life; decrease in falls and the risk of fractures and their complications; mortality due to neurological diseases such as multiple sclerosis, Alzheimer's and Parkinson's.

Dalla Déa, Duarte, Rebelatto, & Dalla Déa (2016) list the somatic changes and morphophysiological factors that are relevant for the elaboration of a physical activity program: reduction in losses in the cognitive domain and physical dysfunctions, which contribute to the reduction of independence; Deterioration of elasticity and stability of muscles, tendons and ligaments; Decline in O2 consumption (VO2 max); Changes in ventricular function (reduction in systole and decrease in myocardial elasticity); Chronic diseases related to aging such as osteoporosis, arthritis, hypertension, diabetes and hypercholesterolemia.

Thus, this research aimed to evaluate the quality of life in elderly people, with pre- and post- physical activity, specifically stretching.

Method

Population and place of study

The study population consisted of elderly people of both sexes, residents of the Alto Tietê region of São Paulo, who were invited throw the local media to participate in the intervention. The service was announced in a newspaper and radio station of the city of Ferraz de Vasconcelos, and leaflets were distributed in main squares and streets.

The activities were carried out at the Sindicato dos Metalúrgicos de Ferraz de Vasconcelos, which granted the physical space of a hall, sufficiently adequated in size and with equipment carry out the physical evaluation and the intervention.

Inclusion and exclusion criteria

Were included elderly aged 60 years or over, of both genders, with or without reports of joint movement difficulties and not participants in another physical activity program, after a medical report who certifying that they were able to perform low-impact exercises.

Were excluded elderly with physical impairment (paralysis of the lower limbs and upper limbs and / or amputations) and who did not present availability at scheduled times, as well as those who participated in the intervention, but with a frequency of less than 50% of classes.

Ethical aspects

All the procedures were detailed, to the participants, by the Informed Consent Form. The risks and benefits were reported and the participant received a copy of the form. The project was send to Ethics and Research Committee of the São Judas Tadeu University (USJT) and approved by the Number 091/2010.

Study Design

The groups took classes on the same days and at the same time, forming thus a unique group of physical activities. The person in charge for the physical intervention was a physical educator specialized in flexibility and stretching. The activity physics program was accomplished in twenty-four classes (three months) and were constituted of stretching exercises. The classes lasted one hour, twice a week (Tuesday and Thursday, from 2 pm to 3 pm). Each exercise lasted 30 seconds, with intervals of 10 seconds between them and repeated three times. All exercises were performed in an active way, with variations between static and dynamic. The overload was increased with the inclusion of a stick and fabric.

Thirty elderly people started the study, four gave up for private reasons and five were excluded because they did not complete the minimum frequency of 50%, and twenty-one ended up the intervention.

Data collect

The inscriptions were made at Sindicato dos Metalúrgicos de Ferraz de Vasconcelos. At the time of inscription, the elderly people were requested to fill in a personal data form (name, gender, ID numbers, date of birth, occupational activity, education level, race, address, contact residence, marital status, household composition and number of children, religion, income family and source of personal income) and clinical data (diseases and medications used, as well as previous clinical events).

Quality of life

To evaluate the perception of quality of life was used the instrument created The World Health Organization (WHO), the World Health Organization Quality of Life Questionnaire (WHOQOL), and WHOQOL-OLD was selected because it was a version focused on aging issues. The WHOQOL-OLD consists of 24 Likert scale items attributed to six facets: "Sensory Abilities", "Autonomy", "Past, Present and Future Activities", "Social Participation", " Death and Dying and "Intimacy", and each facet involves four questions. For all facets, the score of the possible values can be from 4 to 20 as long as all items have been filled. The sum of facets produces a synthesis that can be called the "total score" for WHOQOL-OLD.

It was also applied the WHOQOL-BREF, reduced version of the Quality of Life Questionnaire (WHO, 1996), translated into Portuguese by Fleck (2000). The WHOQOL-BREF is composed of 26 questions in four domains (physical, psychological, social and environmental) and each domain has a scale of 0 to 100.

Both instruments present the scale-based responses of the type Likert, whose minimum values are one point and maximum value, five points.

There are no cut-off points for better or worse quality of life in the WHOQOL and, this way, poorer quality of life is indicated by closer values to zero, and better quality of life by values closer to 100.

The instruments were applied on the first day of the activity, and at the end of the period, to evaluate the influence on the perception of the quality of life of the elderly people.

Data analysis

The data were analyzed by means of a descriptive exploratory analysis of the participants of the study, and for the facets of the pre- and post- physical activity. The possible differences in the results of the facets, between the data of the beginning of activities and the end of the activity, were analyzed through the "t" test, for paired samples with significance level of $p < 0.05$.

For the homogeneity test of the sample, were applied the Kolmogorov-Smirnov Test (K-S) and to test the effect of possible extreme values in the sample was applied the "t" for a single sample, taking the 5% trimmed mean value as the each one of the facets, adopting again as a level of significance $p < 0.05$. The analyzes were performed with parametric techniques.

Results

We began the analysis of data by the detailed characterization of the participants (Table 1). The study population consisted of 21 elderlies (18 Women), with a mean age of 65.71 years (± 5.08).

The group was predominantly women (85.7%), aged 60-69 years (61.9%), and with low schooling (61.90%), and 57.10% did not have any partners; 66.7% were brown; and 66.70%, Catholics.

It was observed that especially elderly people with low income, 47.60% with income less than 1 minimum wage; 57.10% never smoked; reported their own residence (85.7%); And did not live alone (71.40%).

Regarding the type of disease, arterial hypertension was observed in 80.9% of the participants, followed by complaints of arthritis, arthrosis and rheumatism with 38.10%.

Table 1. Sociodemographic characteristics of participants

SOCIODEMOGRAPHIC		TOTAL	
		N	%
Gender	Female	18	85.70
	Male	3	14.30
Age	60 – 69	15	71.40
	≥ 70	6	28.60
Education Level	Low	13	61.90
	Others	8	38.10
Marital Status	With Partner	9	42.90
	Without Partner	12	57.10
Religion	Catholic	14	66.70
	Evangelical	7	33.30
Race	Mixed Race	14	66.70
	White	5	23.80
	Black	2	9.50
Wage Income	≤ 1wage	10	47.60
	> 1 Wage	11	52.40
Tabacco Use	Non-Smoker	12	57.10
	Ex-Smoker	9	42.90
Residence Type	Owner	18	85.70
	Not Owner	3	14.30
Living Alone	Yes	6	28.60
	No	15	71.40
Disease Type	Hypercholesterolemia	2	9.50
	Diabetes	2	9.50
	Arterial Hypertension	17	80.90
	Heart Diseases	3	14.30
	Pulmonary Diseases	3	14.30
	Cerebrovascular Accident	2	9.50
	Arthritis, Arthrosis, Rheumatism	8	38.10

The group had similar anthropometric mean values between itself before and after the study. The weight and BMI (body mass index) were at the significance, both with $p < 0.057$; It is probably that there were no statistics differences among the number of study participants not being high. Anyway, the three anthropometric indicators: weight, BMI and waist circumference values, were reduced after the intervention. It should be specially, for this age group, noted that stretching and flexibility tend to be low to moderate intensity.

Mean values of participants' anthropometric measurements

Table 2. Mean values of participant´s anthropometric measurements

Anthropometric Measurements	TOTAL		sig
	PRE	POST	
	N	N	
Weight	72,10	71,42	0,057
BMI	30,71	30,41	0,057
Waist Circumference	97,21	95,90	0,117

In assessing the classification of the physical level of activity by IPAQ, it was observed a reduction in the percentage of the active level and increase in the irregularly active levels A and B. The values of "Very active" and "Sedentary" were not represented in the sample in none of the evaluation moments (Table 3).

Table 3. Physical level of activity (IPAQ)

CLASSIFICATION	TOTAL	
	N	%
INICIAL		
Active	14	67.70
Irregularly Active "A"	2	9.50
Irregularly Active "B"	5	23.80
FINAL		
Active	10	47.60
Irregularly Active "A"	5	23.80
Irregularly Active "B"	6	28.60
TOTAL	**21**	**100**

It can be inferred that the decrease of these values due to the evaluation of the protocol that predicts to analyze activities of the aerobic type. When added activities of the anaerobic type, such as the intervention of this study, they are not counted for the analysis of the level of physical activity practice. Thus, the participants who stopped walking at least one day of the week, they became less active than at the beginning of the intervention, even if adding another type of activity physics to your day to day. However, in the WHOQO-Bref there was an increase in the between pre- and post-intervention, which was expected due to the activities performed, since the questions of the physical domain relate to the conditions of life, regarding the perception of the physical state and the influence in the day to day, including pain aspects, mobility, daily activities, health and work.

The WHOQOL-Bref analysis (Table 4) indicates through the Kolmogorov-Smirnov test (Table 5) that the Flattening and the Asymmetry demonstrated a normality distribution of data. This result enables the application of parametric techniques for data analysis.

The four dimensions of the WHOQOL-Bref presented improvement in the between pre- and post-activity. However, the data did not show a significant difference between the two moments, it was tested by the "t" test for samples paired with significance level of 0.05%. It is relevant to point out that the study worked with a limited sample.

Tabela 4. Descriptive Statistic WHOQOL-Bref e pre- and post-atividade

| | Central Tendency and Dispersion | | | | | | Distribution | | | |
| | | | | | CI 95% | | Normality | | | |
	Mean	Sig	Standard Deviation	5% Trimmed	Low Bound	Upper Bound	K-S[A]	Sig	Kurtosis	Skewness
Physical Domain Pre	55,44	0,18	25,58	55,84	49,99	60,90	,175	0,091	0,00	-1,31
Physical Domain Post	59,69		22,63	60,14	55,58	63,81	,164	0,145	1,35	-1,12
Psychological Domain Pre	63,10	0,28	18,53	63,81	56,52	69,67	,122	0,200	-0,18	-1,06
Psychological Domain Post	66,47		15,99	66,46	61,29	71,64	,173	0,100	-1,42	-0,64
Social Domain Pre	67,46	0,78	15,10	68,41	60,27	74,65	,234	0,004	1,55	-1,08
Social Domain Post	70,63		14,20	71,05	62,90	78,37	,164	0,146	-0,43	-0,35
Enviroment Domain Pre	51,49	0,32	21,87	51,84	43,97	59,01	,131	0,200	0,32	-1,11
Enviroment Domain Post	54,02		17,56	53,45	49,39	58,65	,129	0,200	-0,07	0,99

[a] Kolmogorov-Smirnov with Lilliefors correction

Another important aspect is that the standard deviations for all dimensions decrease in the post-intervention period, which means that the physical activity program improved the perception of quality of life in the people who participated and approached these perceptions, meaning an increase in the homogeneity of the group. This effect can also be evaluated by the difference lower and upper limit of 95% CI in pre-activity: the difference between these indicators on average it as 10.70, in the post-intervention it was reduced to 8.67. The only one dimension in this tendency was not presented was the social dimension when the CI range, 95%, had an increase in amplitude from 14.38 to 15.48.

Due to the analyzes carried out so far, it seems no effect of maximum values about the average, that is, the interference of possible outliers in the individuals studied. As a way of clarifying this analysis, we turn to the study of trimmed mean (Strimmer 5% - the trimmed mean takes 5% of the data from the sample and is 2.5% of the lower limit and 2.5% of the upper limit). The values of the trimmed mean seem not to be so far from average.

As a way of testing the effects of the trimmed mean, a "t" test was applied for a sample, taking as a reference for each dimension as the value of the test the result of the trimmed mean. The analysis did not present a significant difference between trimmed mean and mean. What results in the inexistence of extreme values, thereby influencing the result of the mean and, consequently, the standard deviation.

In general, it is possible to affirm that there were important effects of the physical practice (stretching) in the perception of the quality of life in the participants of the study.

We analyzed the WHOQOL-Old (Table 5). The Kolmogorov-Smirnov Test For the WHOQOL-Old presented normal distribution of the variables data, with exception for sensory functioning pre- and post-social participation, which did not indicate a normality of the data. In addition, the distribution curves presented a normal distribution (-1.96 to 1.96), with the exception of intimacy and social participation after the period of the activity that presented a positive asymmetry. The intimacy still reported a leptokurtic curve. Another way of normality of data is the fact that the standard deviation of all dimensions has presented indices below 50% of the average value (Field, 2014). This set of analyses enables the application of parametric techniques for data analysis.

The values of the means have distinct directions when we analyze the beginning of activities and after the activities. The dimensions Function Sensory, Autonomy, and, Death and Dying had a fall in values, in contrast, Past Activities, Present and Future, Social Participation and Intimacy have an increase in post-activity values. It's important highlight that since there were significant differences to past, present, and Future activities ($t_{(20)} = -2.15$, $p < 0.05$). It should be noted that there were changes in the pre- and post-interventions for all dimensions; However, the absence of other dimensions with significant differences are a consequence of the reduced number of individuals (n = 21), which limits the sensitivity of statistical analyzes.

The close look at the data, even without the existence of significant differences, points to an influence of practice on the outcome of dimensions. Another aspect is that the standard deviations for all dimensions decrease after the post-intervention, which means that the physical activity program has led to an improvement in the perception of quality of life in the individuals who participated, making the results more homogeneous regarding the perception of quality of life.

This effect can also be evaluated by the difference between the lower and upper limit of the CI 95 % in the pre-activity: the difference between these indicators on average was 20.50, in post-intervention it is reduced to 18.09. However, there is one exception which is the Death and Dying, in which there is an increase in the amplitude of the CI to 95%. In addition, the Death and Dying dimension is the one that presents the lowest values in the two periods of respectively, 51.40 and 49.40, was the only one to have a higher standard deviation in the post activity and consequently an increase in the difference between lower and upper limit of the CI, 95%. It is the only one that does not present possibility of existence of significant difference due to influence of the practice of the exercise program, even with the possible elevation of the participants. It will be fundamental to seek to understand why the differentiated functioning of this dimension.

Tabela 5. Descriptive Statistic WHOQOL-Old pre- e post-activities

| | Central Tendency and Dispersion | | | | | | Distribution | | | |
| | | | | | CI 95% | | Normality | | | |
	Mean	Sig	Standard Deviation	5% Trimmed	Low Bound	Upper Bound	K-S[A]	Sig	Kurtosis	Skewness
Sensory abilities Pre	62,80		25,58	63,51	51,15	74,44	,207	0,019*	-0,85	-1,14
Sensory abilities Post	58,04	0,40	22,63	57,56	47,73	68,34	,163	0,152	0,69	-0,82
Autonomy Pre	63,99		18,53	64,50	55,55	72,42	,152	0,200	-0,92	-0,41
Autonomy Post	60,12	0,29	15,99	59,87	52,84	67,40	,166	0,133	0,11	-0,13
Past, Presente and Future Pre	64,58		15,10	65,13	57,71	71,45	,138	0,200	-0,44	-0,46
Past, Presente and Future Post	71,73	0,04*	14,20	72,06	65,26	78,19	,163	0,151	-0,81	0,70
Social Participation Pre	62,20		21,87	63,16	52,25	72,16	,141	0,200	-1,12	-0,21
Social Participation Post	70,24	0,12	17,56	71,35	62,25	78,23	,187	0,054*	-1,46	3,04[b]
Death and Dying Pre	51,49		25,76	52,00	39,76	63,21	,145	0,200	-0,45	0,27
Death and Dying Post	49,40	0,71	26,95	49,31	37,14	61,67	,179	0,078	0,92	0,28
Intimacy Pre	56,85		28,29	57,59	43,97	69,72	,158	0,182	-0,91	-0,35
Intimacy Post	65,18	0,22	21,88	66,80	55,22	75,14	,184	0,062	-2,58[c]	2,83[b]

[a] Kolmogorov-Smirnov with Lilliefors correction

[b] positive Skewness

[c] Kurtosis leptokurtic

* p < 0,05

The analyzes did not indicate an effect of extreme values on the mean, that is, the interference of possible outliers in the group of individuals studied. The trimmed mean values do not seem to be so far from average. To test the effects of the trimmed mean was applied a "t" test for a single sample, taking as a reference, for each dimension as test value, the result of the trimmed mean and mean. The analysis did not present a significant difference between the trimmed mean and the mean.

What results in the inexistence of extreme values influencing the result of the mean and, consequently, the standard deviation.

From the WHOQOL-Old results, again, there are evidences that there was important effects of physical practice (stretching) on the perception of quality of life of the participants.

Discussion

The absence of significant differences between the two moments (pre- and postintervention) in several of the indicators does not seem to be a primary point of study, because the number of participants and the time of the study can be considered small; Therefore, the time between collections may not have been enough for the effects of stretching were sufficient to impact significantly the results, especially for a population in which the process of physical development tends to exhibit lower latency. It should be recalled that stretching and flexibility activities tend to be of low / moderate intensity, which also affects the speed and intensity of the body's ability to adapt and react to the stimuli.

The stretching and flexibility are associated with improved muscle and joint amplitude, and it has been associated with improved balance (Reddy, and Alahmari, 2016), being one of the variables that can help in the reduction of falls in the elderly people. Add up the results of the study by Cristopoliski, Barela, Leite, Fowler, and Rodacki (2009), who identified increased pitch size, velocity and reduction of support periods in the elderly people. In a cross-sectional study, Souza, Kirchner, and Rodacki (2015) valuated the effects of stretching on the gait of elderly women and found significant differences in gait speed and muscle activation.

In any case, the results pointed to an improved trend of perception of the quality of life of the participants for all domains, both the WHOQOL-Bref how much of the WHOQOL-Old. Conte, and Lopes (2005) analyzed quality of life indicators in the physical domain and associated with the level of habitual activity physic of 14 elderly women participating in the coexistence groups. At the physical domain, there was a higher percentage of positive responses in the items questioned.

The physical domain was positively associated with the physical activity level, when active women responded they felt less pain and discomfort, more energy in day to day, greater satisfaction with sleep, greater capacity of locomotion, greater satisfaction with the performance of activities, greater satisfaction with the ability to less need for medical treatment.

The research of Krabbe and Vargas (2014) evaluated the quality of life perceived by women in different types of physical exercise, showing that levels of satisfaction with the quality of life found for the physical domains, psychological, social and environmental, in the combined exercises and volleyball were significant, demonstrating that there are differences between domains, observing the importance of physical exercise as a means of protection, promotion and prevention of health.

The study by Vecchia, Ruiz, Bocchi, and Corrente (2005) aimed to know the opinion of 365 elderly people from a medium-sized county in the interior of São Paulo through an open-ended question that was included as part of a population survey on style and quality of life and it was possible to relate the set of structured answers by the author to the WHOQOL-Bref domains and the WHOQOL-Old facets. The results indicated the existence of three groups of elderly people, according to their definition of life: the first one valued the affective issue and the family (the interpersonal relationships, emotional balance and good health); The second one prioritized the pleasure and comfort (healthy habits, leisure and material goods); The third one could be synthesized as the elderly people who identifies the quality of life putting into practice their ideals (they were valued spirituality, work, righteousness and charity, knowledge and favorable environments).

In the most recent study, Da Fonte, *et al.* (2016) evaluated the effects of the physical activity in 181 individuals, predominantly women in a physical activity program in Recife. The results indicated significant improvements in WHOQOL-Old and WHOQOL-Bref, which corroborates the results found in this asset, even though concentrated in the stretching activity, while the study cited evaluated subjects in a broader program of physical activity carried out in public parks.

Final considerations

The present study found results that lead to the conclusion that the activity physics based in stretching seems to be beneficial for the studied population.

Thus, there are need for more attention from health professionals about physical exercises and quality of life.

It is also pointed out the precision of more detailed interventions (of the stretching) and the importance of the classes being taught by a physical educator, who can adjust the exercises for this age group, with the purpose of general health indicators.

Thus, physical intervention, through stretching exercises improves of flexibility, can contribute to the quality of life and should be more frequently available to the elderly people.

It must be emphasized that there is a need to increase the number of participants to futures studies, as well as how the effects of stretching practice can affect the perceptions of quality of life and physical valences over longer periods, mainly due to the tendency of a natural decline in physical capacities due to the age. Another point is the insertion and deepening of the evaluation of latency psychosocial variables, in order to evaluate, in addition to the WHOQOL, the effects of the practice and systematization of stretching in the day to day of the elderly population.

References

Campos, A. C. V., Cordeiro, E. C., Rezende, G. P., Vargas, A. M. D., & Ferreira, E. F. (2014). Qualidade de vida de idosos praticantes de atividade física no contexto da estratégia saúde da família. *Texto Contexto Enferm*, *23*(4), 889-897. Recuperado em 26 janeiro, 2017, de: http://www.scielo.br/pdf/tce/v23n4/pt_0104-0707-tce-23-04-00889.pdf.

Conte, E. M. T., & Lopes, A. S. (2005). Qualidade de vida e atividade física em mulheres idosas. *Revista Brasileira de Ciências do Envelhecimento Humano*, *2*(1), 61-75. Recuperado em 26 janeiro, 2017, de: http://www.seer.upf.br/index.php/rbceh/article/view/23.

Cristopoliski, F., Barela, J. A., Leite, N., Fowler, N. E., & Rodacki, A. L. F. (2009). Stretching exercise program improves gait in the elderly. *Gerontology*, *55*(6), p.614-20. Recuperado em 26 janeiro, 2017, de: https://www.ncbi.nlm.nih.gov/pubmed/19713691.

Da Fonte, E., Feitosa, P. H., de Oliveira Neto, L. T., de Araújo, C. L., Figueiroa, J. N., & Alves, J. G. (2016). Effects of a physical activity program on the quality of life among elderly people in Brazil. *Journal of Family Medicine and Primary Care*, *5*(1), 139. Recuperado em 28 dezembro, 2016, de: doi: 10.4103/2249-4863.184639.

Dalla Déa, V. H. S., Duarte, E, Rebelatto, J. R., & Dalla Déa, V. P. B. (2016). *Envelhecimento: informações, programa de atividade física e pesquisas.* São Paulo, SP: Phorte.

Field, A, (2014). *Discovering Statistics using SPSS*. (3th edition): Sage.

Fleck, M. P. A. (2000). O instrumento de avaliação de qualidade de vida da Organização Mundial da Saúde (WHOQOL-100): características e perspectivas. *Ciênc. Saúde Coletiva, 5*(1), 33-38. Recuperado em 26 janeiro, 2017, de: http://www.scielo.br/pdf/csc/v5n1/7077.pdf.

IBGE. (2010). *Censo Demográfico: 2010. Características da população e dos domicílios: resultados do Universo 2010.* Recuperado em 26 janeiro, 2017, de: http://www.ibge.gov.br/home/estatistica/populacao/censo2010/caracteristicas_da_popul acao/tabelas_pdf/tab1.pdf.

IBGE. (2013). *Estimativas da população residente no Brasil e unidades da federação com data de referência em 1º de julho de 2013.* Recuperado em 26 janeiro, 2017, de: http://www.ibge.gov.br/home/estatistica/populacao/estimativa2015/estimativa_dou.shtm.

IBGE. (2016). *Projeções e estimativas da população do Brasil e das Unidades Federais.* Recuperado em 26 janeiro, 2017, de: http://www.ibge.gov.br/apps/populacao/projecao/.

Kalache, A., Veras, R. P., & Ramos., L. R. (1987). O envelhecimento da população mundial: um desafio novo. *Revista de Saúde Pública*, *21*(3), 200-210. Recuperado em 26 de janeiro, 2017, de: http://www.scielo.br/pdf/rsp/v21n3/05.pdf.

Krabbe, S., & Vargas, A. C. (2014). Qualidade de vida percebida por mulheres em diferentes tipos de exercício físico. São Paulo, SP: PUC-SP: *Revista Kairós Gerontologia*, *17*(2), 193-204. Recuperado em 26 janeiro, 2017, de: http://revistas.pucsp.br/index.php/kairos/article/view/21718/16001.

Nóbrega, A. C. L. da, Freitas, E. V. de, Oliveira, M. A. B. de, Leitão, M. B., Lazzoli, J. K., Nahas, R. M., Baptista, C. A. S., Drummond, F. A., Rezende, L., Pereira, J., Pinto, M., Radominski, R. B., Leite, N., Thiele, E. S., Hernandez, A. J., Araújo, C. G. S. de, Teixeira, J. A. C., Carvalho, T. de, Borges, S. F., & De Rose, E. H. (1999). Posicionamento oficial da Sociedade Brasileira de Medicina do Esporte e da Sociedade Brasileira de Geriatria e Gerontologia: atividade física e saúde no idoso. *Revista Brasileira de Medicina do Esporte*, *5*(6), 207-211. Recuperado em 26 janeiro, 2017, de: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1517-86921999000600002.

Papaléo Netto, M., & Pontes, J. R. (1996). Envelhecimento: desafio na transição do século. *In*: *Gerontologia*. São Paulo, SP: Ateneu.

Reddy, R. S., & Alahmari, K. A. (2016). Effect of Lower Extremity Stretching Exercises on Balance in Geriatric Population. *International Journal of Health Sciences*, *Qassim University, 10*(3), 389-395. Recuperado em 26 janeiro, 2015, de: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5003582/.

Souza, R. M., Kirchner, B., & Rodacki, A. L. F. (2015). Efeito agudo do alongamento na marcha de idosas em terreno inclinado. *Fisioterapia em Movimento*, *28*(2), 383-394. Recuperado em 26 de janeiro, 2015, de: doi: http://dx.doi.org.10.1590/0103-5150.028.002.AO19.

Vecchia, R. D., Ruiz, T., Bocchi, S. C. M., & Corrente, J. E. (2005). Qualidade de vida na terceira idade: um conceito subjetivo. *Revista Brasileira de Epidemiologia*, *8*(3), 246-252. Recuperado em 26 janeiro, 2017, de: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1415-790X2005000300006.

WHO. (2015). *World Health Organization. Informe mundial sobre el envejecimiento y la salud.* Recuperado 26 janeiro, 2017, de: http://www.who.int/ageing/publications/world-report-2015/es/.

WHOQOL GROUP. (1994). The development of the World Health Organization quality of life assessment instrument (the WHOQOL). *In*: Orley, J., Kuyken, W., Editors. *Quality of life assessment: international perspectives,* 41-60. Heidelberg: Springer Verlag.

_____

Geovana Mellisa Castrezana Anacleto – Doutoranda em Epidemiologia, Universidade de São Paulo. Mestrado em Ciências do Envelhecimento, Universidade São Judas Tadeu, SP, Graduação em Educação Física pela Universidade de Mogi das Cruzes. Atualmente Docente do Mestrado Profissional em Psicogerontologia, Instituto Educatie de Ensino e Pesquisa. Experiência área de Atividade Física e Envelhecimento, Psicologia do Esporte e Produção Científica, com ênfase em atividade física (flexibilidade) a idosos, fatores emocionais da atividade física e envelhecimento, fatores emocionais e alto rendimento, saúde e alto rendimento. Faz parte do Grupo de Pesquisa Psicologia do Idoso. http://lattes.cnpq.br/0360869598974082.
E-mail: geovana_castrezana@hotmail.com

Rita de Cássia de Aquino – Doutorado em Saúde Pública, Faculdade de Saúde Pública da Universidade de São Paulo. Mestrado em Nutrição Humana Aplicada, Faculdade de Ciências Farmacêuticas da Universidade de São Paulo. Graduação em Nutrição, Faculdade de Saúde Pública, Universidade de São Paulo. Atualmente é docente, no Mestrado em Ciências do Envelhecimento, Universidade São Judas Tadeu. Docente nos Cursos de Graduação Universidade São Judas Tadeu, Universidade Cruzeiro do Sul e Universidade Municipal de São Caetano do Sul. Experiência em Nutrição Clínica, ênfase em Atendimento Nutricional e Avaliação de Consumo de Idosos. http://lattes.cnpq.br/3574501623080697.

Flávio Rebustini – Doutor em Desenvolvimento Humano e Tecnologia, UNESP, Rio Claro: Tese "Vulnerabilidade no Esporte e as novas mídias: um estudo sobre o twitter. estágio doutoral com Prof. Dr. Marcos A. A. Balbinotti, departamento do Psicologia, Universidade de Quebéc em Trois-Rivières, Canadá. Reitor da Universidade do Grande ABC, UNIABC (2008-2010). Mestrado em Ciências da Motricidade, Universidade Estadual Paulista Júlio de Mesquita Filho. Aperfeiçoamento em Voleibol, Instituto Estatal de Cultura Física de Moscou, Rússia, Especialização em Psicologia do Esporte, e em Voleibol, Faculdades Metropolitanas Unidas. Aperfeiçoamento em Teoria e Metodologia do Treinamento Desportivo, Instituto Estatal de Cultura Física de Moscou, Rússia, Graduação em Educação Física, Universidade de Formação Educação e Cultura do ABC, UNIABC. http://lattes.cnpq.br/3871694353284258.
E-mail: frebustini@uol.com.br