

Relationships between subjective well-being, mobility, and independence as a function of age bracket and gender among the elderly

Relações entre bem-estar subjetivo e mobilidade e independência funcional por função de grupo de faixas etárias e de gêneros em idosos

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ABSTRACT

The aim of this study was to investigate the associations of subjective well-being, independence in daily activities, and the measures of mobility and flexibility in the lower limbs of elderly outpatients, according to age groups and gender. 125 people over 60 of both genders were chosen and evaluated. The instruments used were: Functional Independence Measure (FIM) to evaluate their daily activities, Short Physical Performance Battery (SPPB) for their physical performance, and Subjective Well-Being (SWB) for satisfaction with life. The results revealed that women have poorer physical performance and less functional independence than men. The older subjects had lower scores in physical

performance and were more dependent in daily life activities than the younger, however they were more satisfied with life. The results suggest that older individuals and women have greater functional limitation. Meanwhile the older seniors show greater satisfaction with life.

Keywords: Aged, Activities of Daily Living, Quality of Life

RESUMO

Este estudo teve como objetivo investigar as associações de bem-estar subjetivo, a independência nas atividades cotidianas e as medidas de mobilidade e flexibilidade de membros inferiores em idosos em acompanhamento ambulatorial, em relação a grupos etários e de gêneros. Foram avaliados 125 idosos de ambos os gêneros com idade igual ou superior a 60 anos. Os instrumentos utilizados foram: Medida da Independência Funcional (MIF) para avaliar as atividades cotidianas, Short Physical Performance Battery (SPPB) para o desempenho físico, Bem-estar Subjetivo (BES) para satisfação com a vida. Os resultados revelaram que mulheres têm pior desempenho físico e menor independência funcional do que os homens. Os idosos mais velhos tiveram pior pontuação no de-

sempenho físico e são mais dependentes nas atividades de vida diária que os idosos mais jovens. Entretanto eles são mais satisfeitos com vida do que os demais. Os resultados sugerem que indivíduos mais velhos e mulheres têm maior limitação funcional. Entretanto os idosos mais velhos apresentam maior satisfação com a vida.

Palavras-chave: Idoso, Atividades Cotidianas, Qualidade de Vida

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INTRODUCTION

The increase in life expectancy is becoming preeminent and demands the establishment of strategies for the social, mental, and physical well-being of the elderly population, associated with the implementation of actions seeking to prevent and/or treat common diseases and functional disabilities due to functional alterations derived from primary (senescence) and secondary (senility) aging.

Studies emphasize the functional evaluation of the elderly,¹⁻³ an eye on developing intervention strategies that seek to minimize the functional losses and maintain independence in old age.^{4,5} However, little emphasis is placed on studies that associate functional independence and the subjective well-being of the elderly.

Rabelo & Neri⁶ affirm that functional limitations can influence self-esteem, and, while correlating subjective perception with facts lived, individuals can lower their subjective level of well-being.

For Diener,⁷ subjective well-being (SWB) consists of the self-evaluation individuals make of their own lives in the cognitive and emotional aspects, referring to satisfaction with life and to specific domains such marriage, health, and work, among other things.

The SWB is an evaluation of values and expectations both personal and social, as well as of organic and psychological conditions present in the individual. In the ambit of gerontology, this evaluation does not depend only on the evaluation of expectations in the socio-cultural context, but on how much the physical and mental capacity permits participation in social and daily activities.⁸

Diego⁹ affirms that the subjective evaluation of satisfaction with life demonstrates the expressions of individuals on their criteria for overall satisfaction and specific aspects, and reflects the way and the reasons for the individuals to live their experiences positively.

Due to the fact that the SWB is influenced by factors related to health, to socioeconomic conditions, and to cognitive and emotional states, the impact of these variables on the SWB of the elderly still needs evaluation in our context.

Few studies have been made to verify the relationship between the SWB and the variables of socio-demographics, functionality, and independence in the daily life activities (DLAs).¹⁰⁻¹²

This study seeks to lend support in establishing interventions that promote health and maintenance of independence and of quality of life for the greatest number of years possible.

OBJECTIVE

The present study sought to identify the association of age and gender groups, the SWB (general and related to domains), independence in the DLAs as evaluated by the Functional Independence Measurement (FIM), and the functional measurements as evaluated by an instrument to measure the mobility and flexibility of lower limbs (muscular strength, gait velocity, and balance) in the elderly in polyclinic monitoring.

METHOD

This is a transverse, exploratory study, integrating the Thematic Project called: "Quality of life in the elderly: indicators of frailty and of subjective well-being", which seeks to identify and analyze the factors of association and of discrimination of frailty related to physical and mental health in the elderly, correlating the impact of these variables on the quality of life of these elderly. The study was conducted at the *Ambulatório de Geriatria do Hospital das Clínicas da Universidade Estadual de Campinas* (HC - Unicamp) (Geriatric Polyclinic of the Clinics Hospital at the Campinas State University) under the coordination of professors from the Post-Graduation Program in Gerontology from the Unicamp Medical Sciences School.

The protocol utilized for the collection of data for the Thematic Project was composed of 17 sections that included closed questions as well as tests scientifically recognized and validated in our field concerning physical and mental health, life conditions, functional evaluation, measurements of physical performance, and subjective well-being.

The data was collected by students from Unicamp Post-Graduation courses in Gerontology, in Physical Education, and in Odontology, after training and after validation of the collection instrument. When the elderly came to be attended at the Geriatrics Polyclinic, they were invited to participate in the study and signed the Free and Informed Consent Forms. If they refused there was no consequence to his/her consultation and treatment at the service.

Subjects

In this study, 125 elderly people participated from the mentioned polyclinic in the period from August of 2006 to September of 2007, with minimum age of 60 years, of both genders, in physical and mental conditions to understand and answer to the protocol, and

who agreed to participate in the study, in accordance with their signed Free and Informed Consent Form. People were excluded from this study if they had difficulties communicating and expressing themselves, which would have made it impossible for them to respond to the instrument of research, and also those who refused to participate.

The criterion for referring patients to the geriatrics polyclinic of the CH at Unicamp was that it accepts people 80 years or older for regular consultation, regardless of their health condition (healthy or not). Those who are not 80 years old yet will only be seen after confirmation of some pathological conditions by other services, which creates a group composed of elderly people with diseases or health problems.

This study was approved by the Ethics Committee from the Medical Sciences School at the Campinas State University, in conformity with Resolution 196/96.

Collection of data

Data was extracted for the present study referring to the following items:

Socio-demographic characterization: gender, age, marital status, literacy, retirement, and family arrangement.

Mobility and Flexibility (of lower limbs): evaluated by the Short Physical Performance Battery (SPPB) instrument proposed by Guralnik et al¹³ and composed of three tests that evaluate: balance, gait, and strength of lower limbs. Balance is evaluated in three positions of the feet: first in parallel, then with the hallux touching the medial edge of the heel, and last, with the hallux touching the posterior edge of the heel. The value attributed is 1 point if the position is held ≤ 10 seconds, and 0 (zero) if >10 seconds for the two first positions. For the third position, the score is 0 (zero) if time < 3 seconds, 1 point if time varies from 3 to 9.99 seconds and 2 points if ≥ 10 seconds. For the gait test, a chronometer was used to measure (in seconds) the time that the individual took to walk four meters (back and forth), repeating the course two times. The score attributed is: 0 (zero) when incapable, 1 if > 8.70 seconds, 2 if varied between 6.21 and 8.70 seconds, 3 if between 4.82 and 6.20 seconds, and 4 if < 4.82 seconds. The last test in the battery is muscular strength of the lower limbs, in which the subject must get up and sit down on a chair, with the upper limbs crossed on their chest, five times without interruption. The score varies according to the time (in seconds) taken to execute the sequence: 0 (zero) when incapable, 1 if > 16.7 seconds, 2 if it ranges between 13.70 and 16.69 seconds, 3 if between 11.20 and 13.69 seconds,

Table 1 - Socio-demographic characteristics of the elderly in the study (n=125) Campinas, 2007.

Variables	Categories	n (%)
Gender	Males	48 (38.4)
	Females	77 (61.6)
Age (in years)	60 - 69	24 (19.2)
	70-79	55 (44.0)
	≥ 80	46 (36.8)
Marital Status	Married	55 (44.0)
	Widowed	58 (46.4)
	Divorced	4 (3.2)
	Single	8 (6.4)
Literate	Yes	83 (66.4)
	No	42 (33.6)
Retired/ Pensioner	Yes	113 (90.4)
	No	12 (9.6)
Lives w/ partner	Yes	52 (41.6)
	No	73 (58.4)
Lives w/ partner, son/daughter's family and grandchildren	Yes	31 (24.8)
	No	94 (75.2)
Lives alone	Yes	14 (11.2)
	No	111 (88.8)

Table 2 - Descriptive statistics of the scores of the SPPB, FIM, and SWB instruments for the elderly and analysis of internal consistency of the instruments (n=125) Campinas, 2007.

	Variables	Score average (±sd*)	Mean	Variation observed	Possible Variation	Cronbach α Coefficient
SPxPB	Balance	2.61 (±1.39)	3.00	0 - 4	0 - 4	
	Gait	1.95 (±1.02)	2.00	0 - 4	0 - 4	
	Muscular Strength	0.98 (±1.72)	1.00	0 - 4	0 - 4	
	Total SPPB	5.53 (±2.56)	6.00	0 - 11	0 - 12	0.71
FIM	FIMm	82.07 (±9.69)	85.00	44 - 91	13 - 91	0.92
	FIMcs	30.87 (±4.81)	33.00	14 - 35	14 - 35	0.86
	Total FIM	112.9 (±12.86)	116.00	67 - 126	18 - 126	0.92
SWB**	PH	2.13 (±0.70)	2.00	1 - 3	1 - 3	
	PHC	2.37 (±0.73)	3.00	1 - 3	1 - 3	
	Satisglob	2.37 (±0.70)	3.00	1 - 3	1 - 3	
	Satisgloc	2.45 (±0.67)	3.00	1 - 3	1 - 3	
	Satisdom	29.72 (±4.41)	30.00	13 - 36	13 - 39	0.79

*sd=standard deviation, **Missing =2; FIMm= FIMmotor; FIMcs=FIM cognitive social; PH=perceived health; PHC=perceived health compared; Satisglob=overall satisfaction with life; Satisgloc=overall satisfaction with life compared; Satisdom=satisfaction referring to domains.

and 4 if < 11.19 seconds. The total score of the SPPB obtained by the sum of the scores of each test, varies from 0 (zero) to 12 points with the following gradation: 0 (zero) to 3 points when incapable or has very bad performance, 4 to 6 points represents low performance, 7 to 9 points in case of moderate performance, and 10 to 12 points indicates good performance.

Functional Independence Measurement (FIM): is one of the most utilized methods to evaluate the individual's need for help from another person to perform the DLAs. This instrument was developed in the 1980s, and in our field it was adapted by Riberto et al.¹⁴ It contains 18 items divided into two sub-scales: motor FIM (FIMm), responsible for evaluating self-care ac-

tivities, sphincter control, mobility, and locomotion; and cognitive/social FIM (FIMcs), which evaluates communication and social cognition. The score varies from 1 (total dependence) to 7 points (total independence) for each task. The sum of the scores obtained for each item corresponds to the total score, and can vary from 18 to 126 points. The highest scores indicate greater functional independence.

Subjective Well-Being (SWB): analysis of the overall satisfaction with life in general and about satisfaction with specific aspects. The evaluation was made through the following items: two questions about perceived health, with the first question about health perception of the elderly person being general and the second question about his/her health when compared to another individual of the same age: two questions referring to overall satisfaction, the first about the satisfaction of the elderly person with his/her own life and the other question about their satisfaction with life when compared to the life of another person of the same age; and 13 questions about satisfaction referring to domains (health, memory, capacity for resolution, friendships, help of others, care with health, attention and kindness from other people, environment, work, local conditions and living conditions, access to health services, and means of transport). For each question a value of one to three can be attributed, with the highest score indicating the best perception and most satisfaction.

Data Analysis

The data was submitted to the following analyses:

Descriptive with measurements of position (average, median, minimum and maximum), and dispersion (standard deviation) for the treatment of socio-demographic data and scores of the instruments utilized.

Reliability: with determination of the Cronbach Alpha Coefficient, to evaluate the internal consistency of the instruments. A Cronbach Alpha Value of > 0.70¹⁵ was established as evidence of satisfactory internal consistency.

Comparison (Mann-Whitney and Kruskal Wallis): for the comparative analysis the Mann-Whitney tests were utilized for comparison of numerical variables between two groups and the Kruskal-Wallis test for the comparison of numerical variables among three or more groups.

The level of significance adopted for the statistical tests was 5% (p≤0.05).

RESULTS

From a total of 125 elderly people, 61.6% were females; ages varied from 60 to 93 years (72 ±7.4) with mean of 77 years; 46.4% of the elderly were widowed, 44% were married, and 41.6% lived with a partner. Most subjects were literate (66.4%) and retired (90.4%), as presented in Table 1.

In Table 2 we can see that the variation obtained from the scoring of the SPPB, SWB, and FIMcs items corresponds to the possible variation of the score. The average SPPB total score was 5.53(±2.4), a value that corresponds to poor performance of the lower limbs. However, the average score for the Total FIM was 112.9(±12.86), which represents functional independence. In relation to the evaluation of the SWB, the satisfaction referring to domains showed an average of 29.72(±4.41). The values for the Cronbach Alpha Coefficient higher than 0.7 point to high internal consistency of the instruments utilized.

Table 3 shows the comparison between the scores (average, median, and standard deviation) of the SPPB, FIM, and SWB instruments according to the gender. There was significant difference between the genders and the values of the scores for the SPPB and FIM instruments, with males presenting higher average scores. In the Total FIM, the average and the median of the scores were higher among the males, however, both genders presented high values, which shows independence for the DLAs of these elderly. The average of the scores for the Total SPPB tests with values significantly higher among males is noteworthy. While males showed an average close to scores that represent moderate performance and also medians of the same value, the average and median for females scores pointed to a low physical performance of the lower limbs. In relation to the SWB, there was no significant difference between genders, with exception of the item referring to perceived health compared, in which males also presented higher scores.

The comparisons by age bracket between the scores (average, median, and standard deviation) of the SPPB, FIM, and SWB instruments are in Table 4. There was a significant difference between the SPPB scores, with better scores among the younger participants (60 to 69 and 70 to 79 years old), except for the item that evaluates the strength of the upper limbs. The SWB also revealed statistical significance when compared by age, in all its components, except perceived health and overall satisfaction with life when compared with other people of the same age. The data reveals that the older participants (≥80 years old) showed higher scores for perceived health, for overall satisfaction with life, and for domains, when compared to the younger participants. On the other hand, the FIM values were not significantly different between the age brackets. It is noted that as age increases, the averages and the medians of the total SPPB scores diminish, going from moderate to low performance. However, the aver-

Table 3 - Comparison of the values for average, median, and standard deviation of the scores for SPPB, FIM, and SWB according to the gender of the elderly (n=125) Campinas, 2007.

	Variables	Males		Females		p-value*
		Average (±sd)**	Mean	Average (±sd)**	Mean	
SPPB	Balance	3.13 (±1.16)	4.00	2.29 (±1.43)	2.00	0.01
	Gait	2.40 (±0.94)	2.00	1.68 (±0.99)	1.00	0.01
	Muscular Strength	1.15 (±0.74)	1.00	0.87 (±0.69)	1.00	0.01
	Total SPPB	6.67 (±2.08)	7.00	4.82 (±2.59)	4.00	0.01
FIM	FIMm	85.65 (±5.74)	88.00	79.77 (±10.97)	82.00	0.01
	FIMcs	31.92 (±4.63)	34.00	30.20 (±4.84)	32.00	0.01
	Total FIM	117.6 (±9.17)	121.00	110 (±14.02)	112.00	0.01
SWB***	PH	2.25 (±0.56)	2.00	2.05 (±0.77)	2.00	0.17
	PHC	2.58 (±0.61)	3.00	2.23 (±0.76)	2.00	0.01
	Satisglo	2.48 (±0.65)	3.00	2.29 (±0.71)	2.00	0.15
	Satisgloc	2.58 (±0.58)	3.00	2.36 (±0.71)	2.00	0.09
	Satisdom	29.79 (±4.31)	30.00	29.67 (±4.50)	31.00	0.96

*Mann-Whitney Test **sd=standard deviation, ***Missing =2; FIMm= FIMmotor; FIMcs=FIMcognitive social; PH=perceived health; PHC=perceived health compared; Satisglo=overall satisfaction with life; Satisgloc=overall satisfaction with life compared; Satisdom=satisfaction referring to domains.

ages and medians for the total FIM did not show significant alterations with age, which points to losses that do not compromise their independence for the DLAs.

DISCUSSION

The elderly profile from this sample of 125 elderly people, is in line with other national and international studies,^{4,12,16} with prevalence of increasing functional impairment as the years go by and the predominance of these limitations in females (61.6%).

The results of the present research make it evident that there were significant differences between the genders, with the males posting higher scores in the mobility and flexibility tests of the upper limbs (SPPB), as well as in the execution of daily life activities without the help of another person, data obtained by the FIM.

Studies point out a higher life expectancy for females, although with lower proportion of years

lived free from disability. While being a male is considered a risk factor for an earlier death.^{3,5,17}

When comparing the physical performance (SPPB) between the genders, males demonstrated better results in all items (balance, gait, and muscular strength), and this data is compatible with other studies,^{2,18,19} and highlights the physiological and functional differences between males and females, especially in old age.²⁰

In a study analyzing the differences in health conditions between elderly males and females in Brazil, Parahyba²¹ describes that both genders evaluate their health in similar ways, but that females show higher disadvantages in functionality, because they survive longer than males with their limitations.

Results found in a study by Barbosa et al,⁵ who analyzed the physical capacity of 1,894 elderly people in the city of São Paulo, confirmed a higher score in the physical mobility tests (grip strength, lower limb strength, flexibility, and balance) for the male elderly and a poorer score for the older subjects.

Table 4 - Comparison of the values for average, median, and standard deviation of the SPPB, FIM, and SWB scores among the age brackets (n=125), Campinas, 2007.

	Variables	Age 60-69(n=24)		Age 70-79(n=55)		Age >=80(n=46)		p-value*
		Average (±sd**)	Mean	Average (±sd**)	Mean	Average (±sd**)	Mean	
SPPB	Balance	2.83 (±1.55)	4.00	2.98 (±1.13)	3.00	2.04 (±1.43)	2.00	0.03
	Gait	2.38 (±1.17)	3.00	2 (±0.92)	2.00	1.67 (±1.00)	1.00	0.02
	Muscular strength	1.08 (±0.78)	1.00	1.05 (±0.68)	1.00	0.83 (±0.74)	1.00	0.06
	Total SPPB	6.29 (±3.01)	7.00	6.04 (±2.02)	6.00	4.52 (±2.62)	4.00	0.03
FIM	FIMm	82.71 (±10.98)	88.00	83.35 (±8.15)	86.00	80.11 (±10.60)	81.50	0.21
	FIMcs	30.38 (±5.68)	33.00	31.78 (±3.55)	33.00	30 (±5.54)	31.50	0.25
	Total FIM	113.1 (±14.43)	117.50	115.1 (±10.22)	119.00	110.1 (±14.58)	113.00	0.27
SWB***	PH	1.79 (±0.66)	2.00	2.16 (±0.71)	2.00	2.27 (±0.66)	2.00	0.02
	PHC	2.08 (±0.78)	2.00	2.36 (±0.75)	3.00	2.52 (±0.63)	3.00	0.06
	Satisglo	1.96 (±0.75)	2.00	2.38 (±0.68)	2.00	2.57 (±0.59)	3.00	0.04
	Satisgloc	2.17 (±0.82)	2.00	2.38 (±0.65)	2.00	2.68 (±0.52)	3.00	0.01
	Satisdom	26.17 (±5.00)	25.50	29.91 (±4.05)	30.00	31.41 (±3.35)	32.00	0.01

*Kruskal Wallis Test, **sd=standard deviation, ***Missing =2; FIMm= FIMmotor; FIMcs=FIM cognitive social; PH=perceived health; PHC=perceived health compared; Satisglo=overall satisfaction with life; Satisgloc=overall satisfaction with life compared; Satisdom=satisfaction referring to domains.

In relation to age brackets, the comparison between the test scores also made it evident that the younger participants, between 60-69 years old obtained better results in the physical performance test (SPPB) in all items (balance, gait, and muscular strength of lower limbs). In the same way, the older participants (≥ 80 years old) obtained the worst results in these tests.

In a study by Ostchega et al² with the National Health and Nutritional Survey (NHANES III) research, similar results were found in relation to elderly females being incapable of performing the strength test and obtained even worse results in the balance test, when compared to elderly males. The same result was reported for the older participants, when compared to the younger ones.

As in other studies,^{2,3,5} these results reveal that an increase in age can lead to a decline of physical mobility, for it is known that in older

age, organic alterations occur that can lead to an interruption of homeostasis and contribute to physical limitations.²²

The functional decline of this sample of elderly females can justify the significant comparison of the FIM scores between the genders. In all FIM items (motor and cognitive social) females had lower scores, which indicates a greater need for help from other people to execute their daily activities. This result may affirm that functionality limitations can interfere directly in the daily life activities for the elderly population, especially females.

Nevertheless, even with the decline of mobility at an older age, in this sample there was no significant relation with the FIM, but the data shows that there is a slight decline in scores as the years go by. The FIM detects the functional performance during the execution of daily life activities; however, in the literature

we find that daily activities are the last activities the elderly stop performing when faced with the decline of their state of health.^{23,24}

There is also the possibility of adaptation of the older participants to the decline in motor functionality observed by the SPPB, as well as the possibility of having adaptations at the house of the elderly person to facilitate their access and safety in daily activities, which can contribute to the good score of these elderly in the FIM.²⁵

When comparing the SWB scores between genders, there was significance only for the item of perception of health when compared to other people, which made it evident that males have more satisfaction with their health when compared to other individuals of the same age. Research indicates that females live negative feelings more intensely than males,²⁶ which can justify their greater intensity of dis-

satisfaction towards functional losses related to aging or perception of afflictions.

The SWB obtained significance in the comparison between age brackets for perceived health, satisfaction with life in general, and satisfaction referring to domains, with the older subjects (≥ 80 years old) more satisfied in those items. Research into the quality of life identified the adaptive mechanisms and losses of the elderly as the lessening in degree of demand or aspirations that helps to adjust their goals to their physical conditions.²⁷

For the elderly, overcoming difficulties and obstacles, as strong or traumatic as they may have been, along with their adaptation to this phase of life, is known as resilience.²⁸ Maybe this mechanism can justify why the subjective conditions are responsible for maintaining the psychological resilience in the elderly, even when their biological resilience is compromised.²⁶

We can also point out that the social support, spirituality, religiousness, and personal beliefs are also resources for better satisfaction in this phase of life.²⁹

Another hypothesis for the older group being more satisfied would be the coping mechanism known as descending comparison.³⁰ Comparing oneself to others plays a relevant role in the evaluation and construction of reality and of coping with negative events. On occasions that diminish their well-being, people frequently compare themselves to others who they believe are in worse situation in an effort to improve their well-being, especially when there is no opportunity for instrumental actions.³¹

However, when comparing the items perceived health and overall satisfaction to another individual of the same age, there was no significant difference among the three age brackets studied. Diogo⁹ reports that many times comparison mechanisms are better predictors of well-being for the elderly than objective means such as health conditions. Neri²⁷ highlights that the SWB evaluation is associated with aspects that allow the elderly to have a good perception of themselves when compared to other individuals of the same age. These reports may justify why when compared to other individuals of the same age these elderly do not present significant differences among themselves.

CONCLUSIONS

The findings of this study made evident the predominance of females as well as a higher functional compromising of this gender in this sample of seniors. The SPPB showed the lowest score among the older subjects indicating that increas-

ing age can interfere with physical performance. Notwithstanding, this same group of older subjects that had presented the lowest physical performance have also shown a higher degree of satisfaction in the SWB test, indicating their adaptation to adversity during the course of life.

However, in view of the results of the present study, we can proclaim the relationship between the SWB and functionality. We observed the need to subsidize the prevention of the decline in physical performance that is common in old age and to maintain and/or rehabilitate motor abilities, as well as adapt or reorganize the environment to facilitate access and safety in the daily activities of these elderly people.

New studies must be conducted to analyze the mechanism that led the older subjects in the elderly group, with the worst physical performance in the SPPB test, to have significantly higher scores in the SWB test in relation to the younger participants of the elderly group.

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