Functional capacity and oral health –related quality of life in elderly

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Keywords: activities of daily living; oral health; quality of life; aging.

Funding sources: CAPES - Coordination of Improvement of Higher Level Personnel (Scholarship for Master).

Brief Summary

The dimension that impacted the quality of life related to oral health was physical pain. The domain of physical pain encompasses the discomfort to chew. Elderly people with great physical incapacity tend not to worry about oral health.

Declarations of interest: none.

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Abstract:

OBJECTIVE: To analyze the correlation between functional capacity and quality of life related to oral health of the domiciled elderly. DESIGN: Observational cross-sectional study. SETTING AND PARTICIPANTS: The research was carried out with domiciled elderly people. METHODS: The Katz Index and the Oral Health Impact Profile (OHIP-14) were used to investigate functional capacity and quality of life related to oral health. RESULTS: The evaluation of the total functional capacity resulted in 42.2% of the participants presenting dependence and / or semi-dependencies on at least one function. Spearman analysis has shown that the greater functional incapacity for daily life activities is, the lower is the impact of oral health on life quality. The dimension that impacted the most the variable quality of life related to oral health was physical pain (23.5%). The domain of physical pain encompasses the discomfort to chew, which can be caused mainly by edentulism or poorly adapted prostheses. CONCLUSIONS AND IMPLICATIONS: Elderly people with great physical incapacity tend not to worry about oral health, this results shows the need for actions for dental care and the promotion of oral health in the elderly more functionally incapacitated, to maintain good general health and better quality of life.

Keywords: activities of daily living; oral health; quality of life; aging.

Introduction

Rapid demographic aging leads to changes in the epidemiological profile of the population, where there is a situation in which chronic non-transmissible diseases predominate, thus replacing transmissible diseases.[1,2,3] Chronic conditions significantly compromise the quality of life of the elderly, generating the incapacitating process, where a certain condition affects the functionality and consequently the performance of activities of daily living.[1,3,4]

Functional capacity is influenced not only by biological factors, in this way, the individual's lifestyle may be a possible factor explaining functional disability.[5,6] Studies on functional capacity are necessary to understand how the population is living the years gained with longevity and thus help the health actions developed in primary care services, since this represents a new concept in health and indicative of quality of life.[5,6]

Quality of life may be influenced negatively by poor oral health. The elderly population is generally most affected by the accumulation of risks during life and by the mutilating dental practice due to extensive dental extractions. Therefore, oral alterations compromise the general health of the individual, interfering negatively in the quality of life.[7,8,9]

Several researches have investigated the factors associated with functional disability among the elderly, however, there are few found in the literature that make the association between functional capacity and oral health related to quality of life[1, 5, 10, 11]. Studying this relationship is extremely important to verify if the increase of the physical incapacity of the elderly can somehow interfere in the perception of the impact of oral health on the quality of life. Thus, the objective of this study was to

evaluate the correlation between functional capacity and quality of life related to the oral health of the elderly.

Materials and Methods

It is an observational transverse-type study in which participants of both sexes aged 60 and over living at home were included as participants. The elderly which presented changes in comprehension and expression of the communication were excluded from the study. The sample was calculated based on a pilot study, reaching the minimum value of 156 elderly. The present study was approved by the Institution's Ethics Committee of Research on Human Subjects, number 1604600.

Functional capacity was investigated through the Katz index[12], which is composed of five questions related to basic activities of daily living (BADL).

To evaluate the quality of life related to oral health, the Oral Health Impact Profile instrument was used in its reduced version and validated for the Portuguese language of Brazil[13]. The participant was asked to respond, based on the perception of their teeth, mouth and / or dentures, in the last six months.

For the assessment of edentulism, the use and need of a prosthesis was verified in the participants through the World Health Organization (WHO) instrument, the evaluation was performed by a trained dentist surgeon.

A structured questionnaire was developed and used to collect information related to sociodemographic conditions and systemic comorbidities. The variables investigated were: age, sex, skin color, and schooling. Comorbidities were self-reported by participants and later classified as circulatory, neurological, musculoskeletal, and neoplastic diseases.

Descriptive statistics, Spearman's Correlation Test for ordinal qualitative variables and Man-Whitney's test for dichotomous variables were used for the analysis of the results. All analyzes were performed at a significance level of 5%.

Results

A total of 238 elderly people, whose social variables and comorbidities are presented in table 1, were enrolled. The mean age was 74.4 years, with a minimum age of 60 and a maximum of 101 years. The female gender was predominant in the study (132, or 55.5%), as well as white race (155, or 65.1%) and literate (164, or 68.9%).

Table 1- Socio-demographic variables

Variable	n 238	% 100
Sex		
Male	106	44,5
Women	132	55,5
Race		
Yellow	4	1,7
White	155	65,1
Indigenous	1	,4
Black	32	13,4
Brown	46	19,3
Smoke		
Dependent	188	79,0
Ex-dependent	50	21,1
Alcohol		
Dependent	224	94,1
Ex-dependent	14	5,9
Education		
Illiterate	74	31,1
Literate	164	68,9
Circulatory diseases		
Yes	196	82,4
No	42	17,6
Neurological diseases		
Yes	33	13,9
No	205	86,1
Osteomuscular diseases		

Yes	37	15,5
No	201	84,5
Oncological diseases		
Yes	7	2,9
No	231	97,1
Other Comorbidities		
Yes	51	21,4
No	187	78,6
Use of Prosthesis		
Superior - Yes	173	73,0
Superior - No	64	27,0
Bottom - Yes	110	46,4
Bottom - No	127	53,6
Need of Prosthesis		
Superior - Yes	140	59,1
Superior - No	97	40,9
Bottom - Yes	161	67,9
Bottom - No	76	32,1

Among the self-reported comorbidities, circulatory diseases were the most prevalent (196, or 82.4%). On edentulism, it was observed that the need for a lower prosthesis (161, or 67.9%) is much higher than its use (110, or 46.4%).

Figure 1 shows the results of the four dimensions of the Katz index for functional disability and figure 2 the total size of the Katz index for functional disability. The individuals evaluated showed a higher incidence for the difficulty of maintaining urinary and fecal continence: 91 (38.2%) had partial dependence and 10 (4.2%) total dependence.

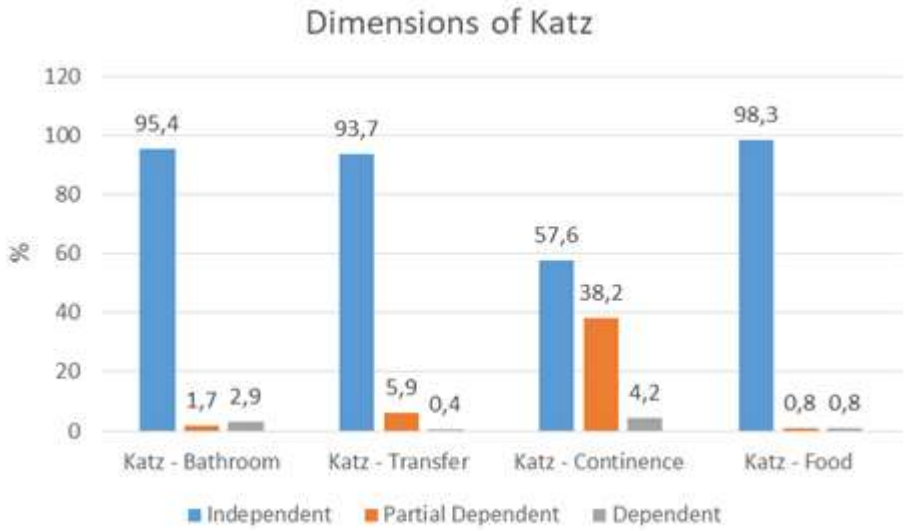

Figure 1 - dimensions of the Katz index for functional disability

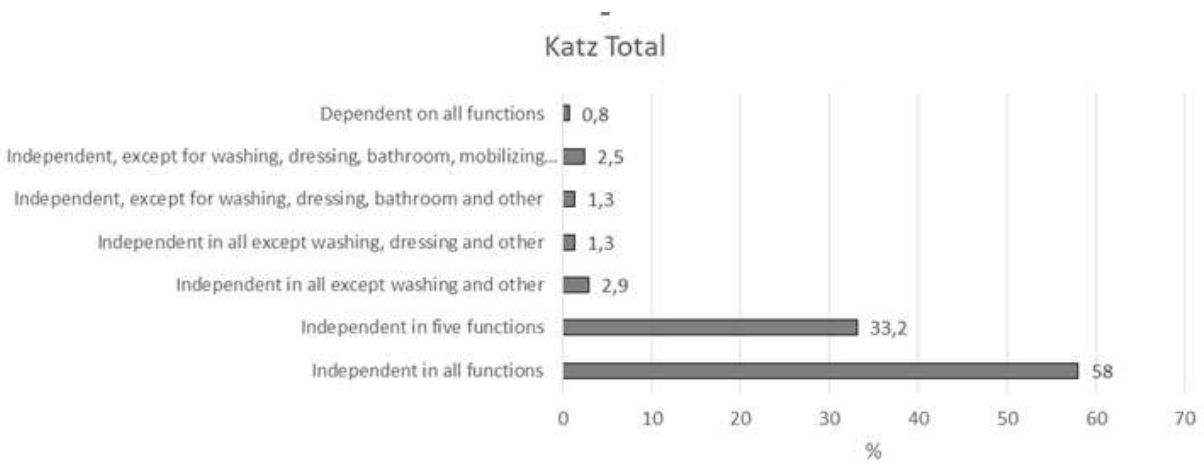

Figure 2 - the total size of the Katz index for functional disability

For the quality of life related to oral health (table 2), the greatest percentage for medium impact was the physical pain dimension (56, or 23.5%) and for strong impact the psychological discomfort dimension (14, or 5.9%).

Table 2 - Descriptive results and Spearman's Correlation Test for oral health related to quality of life

	Poor Impact		Medium Impact		Strong Impact		Spearman - Age	
	N 238	**% 100**	**N 238**	**% 100**	**N 238**	**% 100**	**r**	**p**
Functional limitation	193	81,1	39	16,4	6	2,5	-	-
Physical pain	173	72,7	56	23,5	9	3,8	-	-
Psychological	185	77,7	39	16,4	14	5,9	-0,202	**0,01***
discomfort	224	94,1	11	4,6	3	1,3	-	**-**
Physical disability	214	89,9	22	9,2	2	,8	-0,169	**0,01***
Psychological	237	99,6	1	0,4	0	0	-	**-**
incapacity	231	97,1	7	2,9	0	0	-0,170	**0,01***
Social incapacity	178	74,8	56	23,5	4	1,7	-	-
Deficiency								
OHIP – Total								

The Spearman Correlation Test demonstrated a statistically significant and inversely proportional correlation between OHIP-14 and age dimensions as shown in table 2, the Katz index and the variables age, smoking and OHIP-Total (table 3) and showed correlation among some dimensions of oral health related to quality of life and edentulism (table 4).

Table 3 - Spearman correlation test for functional capacity (Katz index)

	Age		**Smoking**		**OHIP-total**	
	r	**p**	**r**	**p**	**r**	**p**
Katz - Bathroom	0,167	**0,01***	-	-	0,404	**0,01***
Katz - Transfer	0,158	**0,01***	-	-	0,388	**0,01***
Katz - Continence	0,142	**0,02***	-	-	0,364	**0,01***
Katz - Food	-	-	0,190	**0,01***	0,238	**0,01***
Katz - Total	-	-	-	-	0,419	**0,01***

*p<0,05

Table 4 - Spearman correlation test between oral health-related quality of life and edentulism variables

	Use of upper prosthesis		Use of lower prosthesis		Need for superior prosthesis		Need for lower prosthesis	
	r	**p**	**r**	**p**	**r**	**p**	**r**	**p**
Functional limitation	0,020	0,76	0,027	0,68	0,121	0,06	0,065	0,32
Physical pain	0,004	0,95	-0,010	0,88	0,211	**0,01***	0,171	**0,01***
Psychological discomfort	-0,071	0,28	-0,080	0,22	0,070	0,29	0,040	0,54
Physical disability	-0,042	0,52	-0,002	0,97	0,098	0,13	0,118	0,07
Psychological incapacity	-0,074	0,25	-0,091	0,16	0,026	0,69	0,023	0,72
Social incapacity	0,043	0,51	-0,058	0,38	-0,073	0,26	-0,012	0,85
Deficiency	-0,107	0,10	0,015	0,81	0,021	0,74	0,009	0,89
OHIP-Total	-0,152	**0,02***	-0,112	0,08	0,165	**0,01***	0,169	**0,01***

*p<0,05

The Man-Whitney test showed a statistically significant and inversely proportional correlation between the sex dichotomous variable and the variables Katz-continence index (z: -3.280; p = 0.01), total Katz (z: -2.849; p = 0.01) and the physical pain dimension of the OHIP-14 instrument (z: -2.459 p = 0.01).

Discussion

This study analyzed the correlation between functional capacity and quality of life related to oral health of the domiciled elderly. There was a significant correlation between functional capacity and quality of life related to oral health. This is the first study that aims to investigate the functional capacity and quality of life related to oral health using the Katz and OHIP-14 index instruments in domiciled elderly, highlighting the significance and originality of the results obtained.

The sample consisted of 238 elderly people, with a mean age of 74.4 years, with a predominance of 55.5% female, this finding was already expected because it

corroborates with other studies that show the highest probability of survival among women.[3,14,15-18]

Among the comorbidities found, the highest prevalence was of circulatory diseases, with 82.4%, similar to those found in studies by Barbosa et al (2014) and Sousa et al (2014).[15,19] Comorbidities can compromise autonomy, which leads to serious risks to the health of the elderly population, favoring the appearance of disabilities and thus, reducing longevity.[20]

The functional capacity of the elderly participants was assessed using the Katz index. The individuals evaluated showed a higher incidence for the difficulty of maintaining urinary and fecal continence: 91 (38.2%) had partial dependence and 10 (4.2%) total dependence. Incontinence is mistakenly associated as a natural part of aging, and can cause isolation, depression and anxiety, causing disruption to patients and family members. With the increase in life expectancy, health professionals should be alert and able to treat diseases of the elderly in order to improve their quality of life.[21]

Regarding the evaluation of the total functional capacity of the elderly (Katz total), 100 (42.2%) participants presented dependence and / or semi-dependence in at least one function. As the study in question evaluated only the basic activities of daily living (BADL), which are considered simpler and therefore of high severity when the individual can not perform them,[22] the results are alarming. With the longevity and progression of studies that aim to promote the quality of life of the elderly population, the prevalence of active elderly people is increasing,[19] in addition, it is known that elderly residents in the community are more independent, thus presenting a better functional level than elderly people living in long-term residence.[19] Most studies found in the literature show a higher prevalence of disability for instrumental activities of

daily living (IADL) than for BADL, this is mainly due to the fact that functional loss occurs in a hierarchical way, that is, of more complex functions for the simplest. The comparison of the prevalence of disabilities among studies of functional capacity is a complex task, mainly due to the socioeconomic, cultural differences and methodology used. In spite of this, studies have demonstrated a greater limitation for IADL when compared to BADL, independently of the instruments used[3], so it can be concluded that the elderly evaluated presented a worrying limitation of functional capacity, since they demonstrate losses of functions considered simpler. Spearman's correlation analysis showed a statistically significant correlation between all dimensions of functional capacity and total OHIP, ie, the greater the functional disability for daily activities, the lower the impact of oral health on quality of life. This result may be related to the hypothesis that the greater the inability to perform simple and extremely necessary activities for survival and independence, the less is the concern of these elderly with oral health, this does not necessarily mean that the oral health of these individuals is good but because of the physical problems of disability and together with the lack of knowledge about the importance of oral health in general health, these elderly people do not give due importance and attention to the health of the mouth.

For age and functional capacity, the findings showed that the older the individual the greater the occurrence of incapacity to go to the bathroom (r: 0.167; p: 0.01), to perform transference (r: 0.168; p: 0.01) and maintain continence (r: 0.142; p: 0.02), which are in agreement with most studies found in the literature.[3,14,15, 20,22] Age is considered a risk factor for functional disability, mainly due to physiological changes and the prevalence of chronic diseases, which consequently negatively interferes with BADL.[3,14,20] With the increase in the prevalence of disabilities, as well

as that of chronic diseases in the elderly population, it is necessary that the demand for health care specific to this population to be differentiated in relation to the demand for other age groups. This way, efforts are extremely important in the sense of preventing physical dependence, stopping it for longer, generating greater longevity along with a good quality of life.[3,15]

The dimension that most affected the quality of life related to oral health was physical pain 56 (23.5%). The physical pain domain encompasses the discomfort to chew, this discomfort can be caused mainly by edentulism and / or poorly adapted prostheses. The evaluation of the use and need of prosthetics of the elderly participants demonstrated that a large part of the elderly do not use inferior prostheses, however there is this need for use. The non-adherence of the lower denture occurs due to the difficulty of retention due to the lower basal area of the mandible, making the use of the denture extremely uncomfortable and often painful.[23] Besides that, statistically significant correlation between physical pain and need of use of upper (r: 0.211, p: 0.01) and lower (r: 0.171; p: 0.01) prosthesis was found, that is, the higher the negative impact for physical pain, the greater the need for a prosthesis. It was also found a hypothesis that the greater the negative impact on oral health related to the lower quality of life is, the lower is the use of prosthesis by the elderly and the greater its need.

Difficulty chewing can change food choices. Dental problems such as dental loss and poorly adapted prostheses can cause the elderly to establish a diet rich in pastier and poorly fibrous nutrients, leading to nutritional imbalances and malnutrition. Malnutrition is a common occurring factor in the third age, resulting in a decrease in muscular strength, its cause is multifactorial and may be associated with chronic noncommunicable diseases, deficiencies, depression, chewing problems

and/or swallowing and even lack of independence to eat,[15] which affects the general health, functional capacity and consequently the quality of life.[24]

The studies found in the literature that present results on functional capacity and oral health, mostly do not correlate quality of life, but only clinical variables of oral health, in this way, the comparison of the results of the studies becomes complex and difficult to be executed. No work was found in the literature that correlates the variables functional capacity and quality of life related to oral health, using the same instruments that were used in the present study.

Some limitations were found, so we highlight the observational transverse-type epidemiological design that does not allow us to conclude a cause and effect relationship between the studied variables. Comorbidities were self-reported and may be underestimated or overestimated. Finally, another limitation refers to the absence of an instrument that evaluates the nutritional status of the elderly, which, as could be observed, may hypothetically influence in some way the functional capacity and quality of life related to oral health.

Conclusion and Implications

From the data found in this study, we conclude that functional disability increased with age. The evaluated elderly presented loss of at least one daily life activity considered simple and basic for their independence, which is alarming. The individuals evaluated seem to leave oral health in the background as there is an increase in disability, which consequently will influence the overall health and quality of life of this population. Thus, the results found in this study contribute actively to the improvement of health care policies for the elderly, as it shows us the need for

greater attention and actions for dental care and promotion of oral health in the more functionally disabled elderly.

Statement of Ethics

The study protocol has been approved by the research institute's committee on human research, number 1604600.

All the other authors declare no conflicts of interest, financial and personal.

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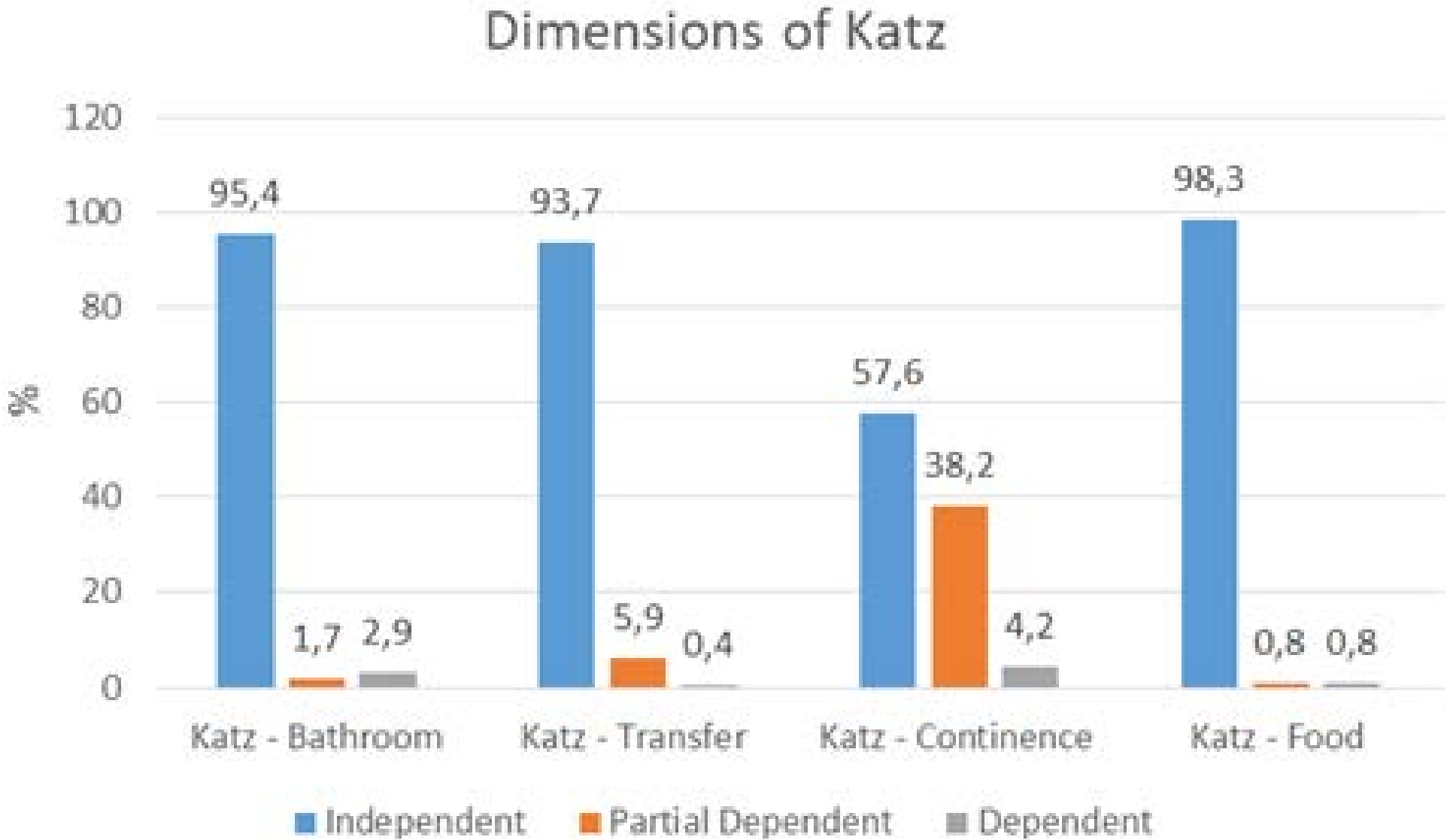
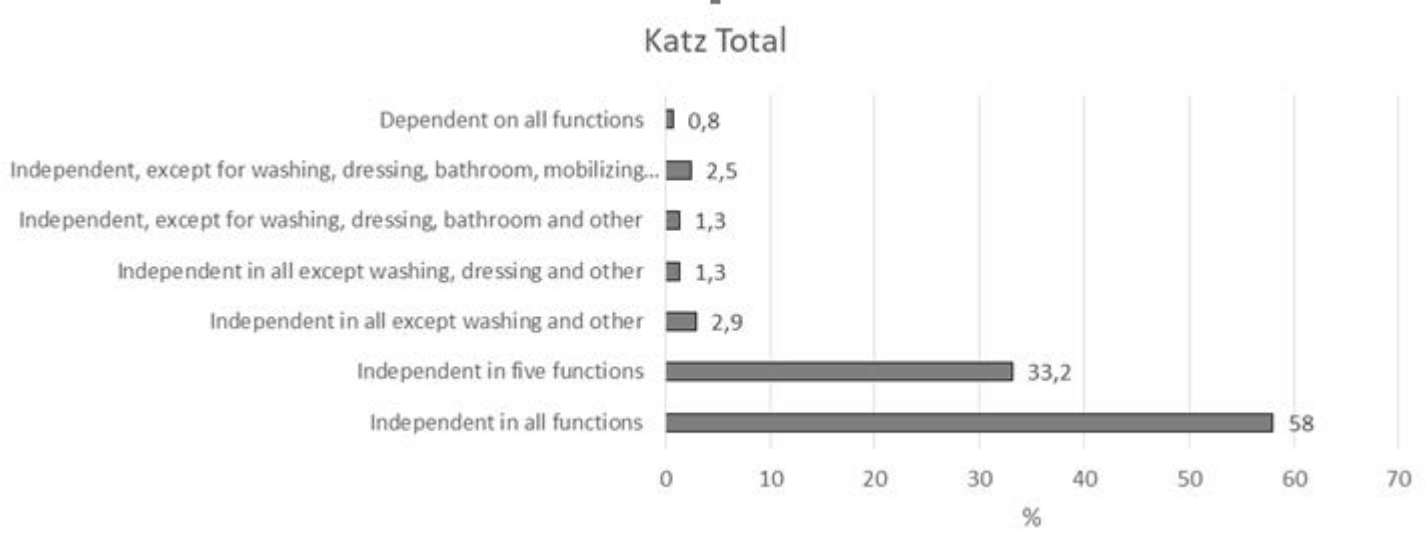

Dimensions of Katz
120
100
80
60
40
20
0
%
95,4
1,7
2,9
93,7
5,9
0,4
57,6
38,2
4,2
98,3
0,8
0,8
Katz - Bathroom
Katz - Transfer
Katz - Continence
Katz - Food
Independent
Partial Dependent
Dependent


Katz Total
Dependent on all functions
0,8
Independent, except for washing, dressing, bathroom, mobilizing...
2,5
Independent, except for washing, dressing, bathroom and other
1,3
Independent in all except washing, dressing and other
1,3
Independent in all except washing and other
2,9
Independent in five functions
33,2
Independent in all functions
58
0
10
20
30
40
50
60
70
%