

# AGEING AT WORK: CAPACITY FOR THE WORK OF ESTESC TEACHERS

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## ABSTRACT:

**Introduction:** Aging does not necessarily mean a decrease in "ability to work" and that the eventual decline of certain skills related to increasing age are not generalizable, striking, or uniform and can be accelerated or delayed depending on the conditions of work, individuals and, above all, the types of attrition to which the worker is subjected<sup>14</sup>. **Objective:** To evaluate the work ability index (WAI) of the professors of the School of Technology and Health of Coimbra (ESTeSC). **Material and Methods:** This study was an analytical observational and prospective cohort study. The respondents answered a questionnaire that assessed the WAI and the quality of life index (QLI). The results were evaluated in the IBM SPSS Statistics program through descriptive character tests and inference tests. **Results:** It was verified that an average value of 33.63 (7-49 scale) was identified for the work ability in the studied group, being this value belonging to the Moderate category. When correlating the age of workers with WAI and QLI, it was verified that there was no correlation ( $p > 0.05$ ) between these factors. On the other hand, WAI was related to QLI, in which a correlation was observed ( $p < 0.05$ ), that is, the more satisfied they are with quality of life, the better the capacity for work. **Conclusion:** It was found that in the present study, aging does not cause a loss of capacity for work, nor does it influence the quality of life of workers. Since teachers' scores for WAI are in the Moderate category, it is necessary to implement health promotion strategies, such as practicing physical exercise or performing work-related gymnastics in the workplace.

## 1 INTRODUCTION

The aging of the working population is a frequent theme in modern societies, where the number of people over the age of 50 tends to increase in the coming decades<sup>24</sup>. Aging does not necessarily mean a decrease in "ability to work" and that the eventual decline of certain skills, related to the increase in age, are not generalizable, striking, or uniform, and can be accelerated or delayed depending on the working conditions, the individuals and, above all, the types of attrition to which the worker is subjected<sup>14</sup>. The forecasts by the European Agency for Safety and Health at Work (EU-OSHA) indicate that in 2030, 30% of the active population of most countries europeans (including Portugal) is between 55 and 64 years old<sup>3</sup>.

There are particularities of aging related to the activities that people exercise, which must be taken into account, in the search for an understanding of this process<sup>1</sup>. The education professional develops one of the most important activities of society. In addition

to requiring time-off for student training and commitment to the tasks of class preparation, the teaching work includes performing administrative services of the pedagogical practice, building plans and school projects, and evaluating students academic outputs. The performance of these activities requires good physical and mental health because it requires great physical and psychic efforts<sup>6</sup>. Recent studies have evidenced an increase in the number of health-related injuries of teachers with consequent impairment of their work capacity<sup>7</sup>. The World Health Organization (WHO) has shown concern about the issue of work-related aging and recognizes that changes occur in the various systems of the human body that lead to a gradual decrease in the effectiveness of each of them, with a decrease in the functional capacity of individuals which can generate conflicts between the functional capacity and the demands of the work<sup>4</sup>. The physical and mental health of any worker is a determining factor for the capacity to work<sup>7</sup>. Fifty years ago the WHO challenged the traditional design of health centered on its

physical dimension and absence of disease and went on to define health as "a complete state of physical, mental and social well-being, and not merely the absence of disease or infirmity"<sup>27</sup>. The conceptual definition of capacity for work is the question of how well the worker is now and in the near future and how well he is fit to do his job relation to the demands of work, health and mental resources<sup>9</sup>. Maintaining work capacity involves adequate health and work conditions, whether in interpersonal or environmental relationships. It is important to emphasize that in this way, this will translate into a better quality of life inside and outside work and greater productivity<sup>2</sup>. Age does not necessarily determine a reduction in work capacity, but it means greater diversity in the way workers deal with the demands and in the type and degree of adequacy of their responses<sup>8</sup>.

According to the literature, the concept of quality of life emerged at the beginning of the twentieth century directed to the conditions of work and the effects of this on the workers<sup>10</sup>. The quality of life is the perception of the subjects about their position before society, permeated by their culture, values and everyday life and with a view to their goal and life expectancies and ways of thinking about their life<sup>13</sup>. The Quality of Life Index (QLI) is an indicator that can measure the quality of life in terms of satisfaction with life subjectively emphasizing the perception of satisfaction / importance that the various aspects of everyday life are exposed to the individual itself<sup>19</sup>.

Therefore, as the workforce grows older, it is essential to develop measures for disease prevention and health promotion in work situations, seeking the preservation and development of capacities and maintenance of the quality of life inside and outside work<sup>25</sup>.

## 2 MATERIAL AND METHODS

### Study design

The present study was carried out in the 2017/2018 school year and data collection was performed between February and June 2018. This study was presented as level II, of the analytical observational type and of the prospective cohort.

### Population and Sample

The target population was the professors of the School of Technology and Health of Coimbra (ETeSC). The type of sampling was non-probabilistic and the technique was for convenience. The inclusion criteria were: the teachers were in the age group between 28 to 62 years old and were

teachers of the ESTeSC. The total number of teachers participating in this study would be 130. However, the sample obtained in this study was 46.

### Instruments and Data Collection

Data collection was done through the completion of a questionnaire, which included a first part with sociobiographical information, a second part related to the work ability index (WAI) and a last part referring to the quality of life index (QLI).

The WAI is an instrument built on 10 items that are composed of several issues, which consider diseases, physical and mental demands of work. These items constitute seven dimensions, each evaluated by one or more questions. The calculation of the global scale takes into account the sum of the points received for each of its items<sup>12</sup>. The ability to work compared to the best of all life varies on a scale of 0-10, Ability to work in relation to physical requirements ranges from 2-10, Number of current diseases diagnosed by the doctor ranges from 1-7, Estimated loss for work due to illnesses ranges from 1-6, Failures to work due to illnesses in the last year (12 months) ranges from 1-5, Prognosis of ability to work within 2 years varies between 1, 4 or 7 and Mental resources range from 1-4. The larger the global WAI scale, the better the workers ability to work.

The QLI in this study was used as an indicator that seeks to measure the quality of life in terms of life satisfaction in a subjective way, being this adapted for the general population (generic version III). The first part was based on the level of satisfaction of the respondent in the various domains of life or areas, and the items are presented on a Lickert scale ranging from 1 "very unsatisfied" to 6 "very satisfied". The second part focused on the degree of perceived importance of the respondent in these same areas or domains of life, and the items are also presented on a Lickert scale ranging from 1 "no importance" to 6 "very important". This index is evaluated both globally and in four dimensions: Health and Functionality, Social and Economic, Psychological and Spiritual and Family, giving a total of 33 items<sup>19</sup>. In order to estimate the scores, each item of satisfaction should be weighted by its importance correspondent, which allowed us to affirm that the highest scores represent high satisfaction and high importance and the lowest satisfaction low but high importance. The estimation of scores was guided by the principle that people who are satisfied with areas they consider important enjoy a better quality of life than people who are dissatisfied with areas that they consider important<sup>10</sup>.

## Statistical analysis

Statistical analysis of the collected data was performed using the IBM SPSS Statistic version 25 software for Windows 7. Using this software it was possible to use descriptive statistics such as location (average) and dispersion (standard deviation) measurements. The tests used were the Wilcoxon nonparametric test and the Pearson Linear Correlation Coefficient test.

## Ethical issues

All data collected was used solely for academic purposes, and was not disclosed for other purposes other than that previously mentioned, without any financial or economic interests. The completion of the questionnaires had the consent of the chair of the ESTeSC, being informed about the objectives of the study, always maintaining the anonymity of the answers obtained.

## 3 RESULTS

### General characterization of the sample

Observing table 1, it was verified that the majority of the respondents, of both the feminine and the masculine gender were married and had Masters. Regarding the ages, it was observed that the age of the participants in the study ranged from 28 to 62 years, and the total mean age was 44.37 years. However, it was observed that the mean was identical in both the female (44.41) and the male (44.29).

TABLE 1- SOCIOBIOGRAPHIC CHARACTERIZATION OF TEACHERS OF ESTESC

		Genre				Total	
		Female		Male		n	% column
		n	% column	n	% column	n	% column
Civil Status	Unmarried	5	15,6	3	21,4	8	17,4
	Married	19	59,4	10	71,4	29	63,0
	Unity of fact	5	15,6	0	,0	5	10,9
	Separated/ Divorced	3	9,4	1	7,1	4	8,7
	Total	32	100,0	14	100,0	46	100,0
Literary abilities	Graduation	5	15,6	0	,0	5	10,9
	Master	13	40,6	8	57,1	21	45,7
	Doctoral	11	34,4	6	42,9	17	37,0
	Post Doctoral	3	9,4	0	,0	3	6,5
	Total	32	100,0	14	100,0	46	100,0
		M	SD	M	SD	M	SD
Age		44,41	7,16	44,29	9,60	44,37	7,87

LEGEND 1- N = SAMPLE NUMBER; M = MEAN; SD = STANDARD DEVIATION

### Inferential analysis

After data collection it was found that an average value of 33.63 (7-49 scale) was identified for the ability to work in the studied group. Regarding the ICT classification, two of the respondents presented a poor work capacity index (7-27), thirty seven of the individuals presented a Moderate scale (28-36) and the remaining seven participants in the study entered the Good category (37-43), with none of the teachers meeting an excellent work ability index (44-49).

TABLE 2- WORK ABILITY INDEX

		N	%
WAI	Poor	2	4,3
	Moderate	37	80,4
	Good	7	15,2
	Total	46	100,0

LEGEND 1- N = SAMPLE NUMBER; % = PERCENTAGE

According to table 3, we can verify that there was no correlation between the teachers age and their perception of their ability to work ( $p > 0.05$ ). We also found that there was no correlation between the age of teachers and the index of work ability calculated through the results obtained in the questionnaires. However, we can observe a positive correlation pattern between the participant's perception of ability to work and the capacity to work index as an objective measure ( $p < 0.0001$ ). We can also add that this pattern of agreement was verified in 61% of the respondents under study.

TABLE 3- RELATIONSHIP BETWEEN AGE, WA-PERCEPTION AND WAI

N = 46		Age	WA- Perception	WAI
Age	r	1	.098	-.042
	p		.518	.780
WA-Perception	r		1	.778
	p			<0.0001
WAI	r			1
	p			

LEGENDA 3- N= SAMPLE NUMBER; WA-PERCEPTION= TEACHERS PERCEPTION OF CAPACITY FOR CURRENT WORK; WAI = WORK ABILITY INDEX

Looking at table 5, we try to evaluate the number of years that the worker presented in the institution and how this indicator would be related to both the subjective measure and the objective measure of the capacity for work. We found that there was no relation between the number of years of work and the measures for work capacity under study ( $p > 0.05$ ).

TABLE 5- RELATIONSHIP BETWEEN NUMBER OF YEARS IN INSTITUTION, WA-PERCEPTION AND WAI

N = 46		WA - Perception	WAI
Number of years in institution	r	-.060	-.211
	p	.690	.158

LEGEND 5- N= SAMPLE NUMBER, WA-PERCEPTION= TEACHERS PERCEPTION OF CAPACITY FOR CURRENT WORK, WAI = WORK ABILITY INDEX

After analysis of table 6, it was verified that the majority, that is, 26 of the respondents had a good

perception of their ability to work with regard to mental and physical demands.

According to the mental requirements, it was observed that 16 of the teachers classified their perception of their ability to work as Very good, and the remaining 4 participants in the study considered it Moderate. Regarding the physical requirements, 13 of the respondents rated the perception of their ability to work as Very Good, and the remaining 7 as Moderate.

We can verify that none of the teachers considered their perception of their ability to work as Weak or Very weak relative to mental and physical requirements.

**TABLE 6 - RELATIONSHIP BETWEEN PERCEPTION WA OF MENTAL AND PHYSICAL REQUIREMENTS**

		n	%	%cumulative
Perception WA of Mental Requirements	Very Good	16	34,8	34,8
	Good	26	56,5	91,3
	Moderate	4	8,7	100,0
	Total	46	100,0	
Perception WA of Physical Requirements	Very Good	13	28,3	28,3
	Good	26	56,5	84,8
	Moderate	7	15,2	100,0
	Total	46	100,0	

**LEGEND 6 - WA= CAPACITY OF WORK**

According to table 7, in relation to WAI and QLI, we found a correlation pattern between the indices ( $p < 0.05$ ). We can verify that the objective measure of the Evaluation of Work Capacity correlated positively with both the General Quality of Life index and the respective sub-dimensions of this last indicator. We can affirm that workers with greater capacity for work were also the same workers who present a better perception of health status, in general, as well as health, functional, social, economic, psychological / spiritual and family.

In Table 8, in relation to the WA-Perception and the WAI, we could observe a correlation pattern among the indexes ( $p < 0.05$ ). We can verify that the objective measure of the Evaluation of the Capacity for Work correlated positively with both the General Quality of Life index and the respective sub-dimensions of this last indicator, except with the sub-dimension "Family". We can affirm that workers with greater perception of the ability to work were also the same workers who presented a better perception of health status, either in general, or in terms of health, functionality, social, economic and psychological/spiritual. Relative to the Family

and the perception for the capacity in the work it is verified that there was no correlation ( $p > 0.05$ ). When analyzing table 7 and 8 together, we can verify that the p-value is higher when it relates the Health and Functionality and the Family with the WAI than when it relates to the WA-Perception. Regarding the Social and Economic and Psychological and Spiritual levels, the opposite happens to what was mentioned previously, since when relating these factors with the WAI, lower values were obtained than when compared to the WA-Perception.

N = 46	WA-Perception	Health and Functionality	Social and Economic	Psychological and Spiritual	Family	
WA-Perception	r	1	.302	.420	.379	.285
	p		.041	.004	.009	.055
Health and Functionality	r		1	.647	.642	.793
	p			.000	.000	.000
Social and Economic	r			1	.653	.751
	p				.000	.000
Psychological and Spiritual	r				1	.603
	p					.000
Family	r					1
	p					

**LEGEND 8 - N= SAMPLE NUMBER; WA-PERCEPTION= PERCEPTION TO CAPACITY OF WORK; QLI= QUALITY LIFE INDEX**

## 4 DISCUSSION

Based on the scales obtained from each worker's self-assessment of their ability to work through the Work Ability Index, it was verified in the present study that the professors of the Coimbra School of Technology and Health have a mean scale of WAI of 33.63 points, indicating moderate capacity for work. According to Sérgio Junior, if the ability to work is moderate, it is recommended to encourage worker initiatives to promote their capacity<sup>12</sup>. Kelly Alves, states that the strategies used by the teacher to mitigate losses and facilitate their adaptation to the new phase include the struggle to preserve their own identity, which is a psychological problem experienced in aging<sup>1</sup>.

In the present study, the average age of the respondents was 44.37 and it was found that there is no relation between the age of the workers and the loss of capacity for work. In a previous study, Elaine Marqueze & Claudia Moreno stated that the variable age did not correlate with WAI, that is, having an older age did not imply a lower capacity index<sup>15</sup>. On the other hand, epidemiological studies verified the association of age with early loss of ability to work<sup>9</sup>. Some authors point out that age affects the ability to work for the individual, especially from the age of 45, because the factors that lead to the decrease in the capacity to work begin to accumulate<sup>11</sup>.

With regard to "current work ability, compared to its best", that is, individuals' perception about their ability to work, ranged from a scale of 5 to 10 points.

Kelly Alves, mentions that participating teachers express the idea that teaching as work is an 'antidote to aging' at the level of one's own perceptions<sup>1</sup>.

Regarding "work capacity in relation to the requirements of the activity", a large part of the participants in the study, that is, 25 of the respondents stated that the main demands of their work activity are mental, 10 of the teachers indicated both requirements, and only one of the participants noted physical requirements. Regarding perceived ability to work in relation to mental demands, 34.8% indicated Very Good, 56.5% as Good and 8.7% as Moderate. Regarding physical requirements, 28.3% considered Very Good, 56.5% as Good and the remaining 15.2% as Moderate. Given the answers previously mentioned, Marilú Martins, says that the positive perception of the workers regarding the demands in the work, can be related to the experience in the work, emphasizing the freedom and the sense respect, being added of an improvement in the life outside the work, good relationships with colleagues, leadership, solidarity and trust<sup>18</sup>.

It is important to note that most of the teachers at ESTeSC have been on average for about 13 years at the same institution, but that there was no correlation with their ability to work. Studies carried out with public employees, who had physical work demands, had the capacity to work diminished over the years, due to the organization and work environment<sup>2</sup>.

With regard to diseases, 26.1% of the study participants reported that they did not have any type of disease or injury, the remaining 73.9% mentioned at least one disease or injury. According to studies, from the age of 45, with the appearance and/or aggravation of several types of diseases, physical and mental functional capacity may begin to deteriorate, influenced by the decrease in cardiorespiratory and musculoskeletal capacity as a function of age<sup>17</sup>. As for injuries resulting from accidents, 17.4% of the population studied reported that suffer from spine / back. With regard to musculoskeletal injuries, 13.0% indicated that they suffer from back / neck disorders, with frequent pain. Maria Martinez & Maria Latorre, report that cardiorespiratory capacity and musculoskeletal functioning are the aspects that have the greatest impact on functional capacity<sup>16</sup>. Studies indicate that biomechanical factors involved in physical work demands, among them strength, repetitiveness and inadequate postures, have a great relation with the promotion of musculoskeletal injuries<sup>29</sup>. 17.4% indicated as respiratory disease, chronic sinusitis / rhinitis. 13.0% of teachers stated that they suffer from mild mental disturbance (such as mild depression, nervousness, anxiety, sleep disturbance). Luciano Pereira & Giancarlo Zille, consider stress as a state in which there is an abnormal wear of the human organism, causing a reduction in its capacity to work<sup>22</sup>. The previous authors also affirm that stress is a great concern, being directly related to

workers health and the productivity of organizations<sup>22</sup>. 17.4% indicated that they suffer from an Endocrine and Metabolic Disease, such as Goiter or other Thyroid disease. Regarding the other diseases implicit in the questionnaire, there was no great representativeness.

Regarding the "Estimation of the degree of incapacity for work due to illness", more than half of the respondents, that is, 54.3% indicated as an answer "I have no limitations / I have no disease", 26,1 % said "I can do my job but it causes me some symptoms", 15.2% stated "Sometimes I have to slow down my work or change the way I work", and the remaining 4.3% mentioned "I often have to slow down my work or change the way I work". According to the WAI development methodology, workers who have a greater number of diseases tend to have the capacity for impaired work. To counteract what was said, a study carried out in São Paulo with municipal workers showed that a greater number of diseases implied a decrease in the value of the WAI, besides the physical and mental capacity and impediment to work<sup>2</sup>.

When analyzing "Absenteeism during the last year", it was found that 41 of the participants in the study did not miss a day to work due to health problems. The remaining 5 teachers were only missing a maximum of 9 days of work. As for the "Prognosis of working capacity for two years from now", the answers were positive, with 5 respondents responding "Maybe" and the remaining 41 "Almost certainly". In a similar study, Elaine Marqueze & Claudia Moreno, cite that, of the teachers studied, they did not associate the cited aspects as negative influencers of their capacity for work, since most reported a positive prognosis his ability to work in two years time<sup>15</sup>. Overall, as far as "Psychological resources" are concerned, most positive responses were obtained. Regarding the appreciation of day-to-day activities, only 8.7% indicated "Rarely" and 2.2% "Never". As for the fact that they felt active, the majority were satisfied, with only 2.2% responding "Rarely" and another 2.2% "Never". Concerning optimism about the future, the majority were also satisfied, since only 4.3% of respondents indicated the response "Rarely". In order to emphasize the above, Cristiane Andrade and Maria Moneiro affirmed that the questions regarding the mental resources, in general, presented themselves with positive perspectives, in regard to feeling alert and active, able to carry out daily activities and with hope for the future<sup>2</sup>.

It was found that workers quality of life correlates with their ability to work, that is, the more satisfied they are with their quality of life, the better their ability to work. Dayane Queiroz and José Souza, confirm what was mentioned previously, the higher the WAI, the higher the QLI scales<sup>23</sup>. In studies that approach the teaching work, a variety of factors related to the teaching-learning process can be per-

ceived that can interfere in teachers quality of life and health<sup>28</sup>. According to the present study, it was found that Health and Functionality are the factors that present the highest correlation with the WAI. However, according to the workers perception of their ability to work, they considered that the factor that has the greatest correlation with the WAI is the Social and Economic factor. On the other hand, we observed that the Family factor is the one that has a smaller correlation with the WAI and even with the perception that workers have about their capacity for work. Second, Elaine Marqueze & Claudia Moreno, satisfaction in the exercise of teaching work can increase the capacity for the professional of this area<sup>15</sup>. Mariana Monteiro, Susana Paixão, João Figueiredo & Ana Ferreira, point out that the way each one assesses their health will tend to vary depending on how they deal with the challenges and adversities they will encounter throughout their life cycle<sup>19</sup>.

## 5 CONCLUSIONS

The conclusions we reached with our study allowed us to understand that age is not always related to functional aging and loss of capacity. However, other indicators may be determining factors for assessing the ability to work, such as the diseases and injuries of workers and the requirements they are exposed to. On the other hand, we can verify that the quality of life influences the capacity for work, since the more individuals are satisfied about their Health and Functioning, Social and Economic, Psychological and Spiritual and Family, the better their capacity for job.

It should be noted that the promotion of occupational health is one of the fundamental aspects in maintaining the capacity for work. For health promotion, strategies should be developed, such as performing work gymnastics and devoting a little of their time in day to day exercise. Practicing workout consists of stretching, muscle relaxation, and flexibility of the joints, which is an important workplace strategy that can prevent repetitive strain injuries. Physical Education can act in the promotion of workers' health, identifying problems in the relationship between overload and work capacity, structuring strategies for the balance of these relationships<sup>21</sup>. The regular practice of physical exercise benefits physically, socially and mentally the entire population, regardless of gender and age; being a promoter of better mental health, well-being and quality life<sup>20</sup>.

Faced with the factors studied, it will be important in the future to emerge in new research trajectories, which may take into account other factors. The ideal would be to repeat the assessment of work ability periodically and to analyze the possible changes over the years and to associate the mental health of the workers with the capacity of work and the quali-

ty of life, since after the analysis of several studies it was verified that stress and anxiety are one of the factors that most influence the capacity for work and the quality of life.

Regarding the limitations of this study, we verified that it was not possible to obtain the sample initially studied, due to the difficulty of adherence to participation in filling it.

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