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CORRELATIONS OF AGE AND WORK ABILITY IN A
KINDERGARTEN AND A COLLEGE

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Abstract

The aging of the European Union labor force raises many challenges for safety and health at work, especially those relating to work capacity of older workers who more vulnerable. The correlations between the individual factors (age, gender, current position, level of studies, seniority as an employee in the years of fullment) and work ability (" Labor Capacity "of the Finnish Occupational Health Institute, 2017) were evaluated through a questionnaire administered to the employees of a technical college and kindergarten. The age of the employees correlates negatively, significantly, with the self-perceived work capacity of the worker both in the college employees ($p = 0,037$) and in the kindergarten ($p = 0.018$). Age correlates negatively with the level of education both for kindergarten and college employees. In both educational units, with the increase in the age of the employees, the level of education is lower and the self-perceived work capacity significantly decreases.

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1. Introduction

In the economically developed countries there is a global trend of ageing of the working population. A more active social and public policy in implementing active ageing strategy is required in response to the global trend of workers' ageing across the European Union (Walker & Maltby, 2012). The ageing of the European Union labour force raises many challenges for safety and health at work, especially those relating to the work capacity of older workers who are more vulnerable to accidents and diseases.

2. Problem Statement

In education, older teachers have professional experience and stability, as duration in the workplace. For teachers, the physical overloads as well as the risks of injury at work are not very high. These are just a few arguments that advocate for keeping them in didactic activity even after the retirement age. Finding the factors that are associated with increased or decreased work capacity of teachers is thus a key factor. In a public health institution a study showed that higher age, lower education, and long work history at the institution were significantly associated with reduced work ability (Monteiro, Ilmarinen, & Filho, 2006). Work ability of ageing teachers was significantly lower in comparison to the younger teachers', firstly in teachers who presented higher rates of psychosomatic diseases (Vangelova, Dimitrova, & Tzenova, 2018). Factors identified to be related to a lower work ability were a higher number of health complaints, an inappropriate waist-hip ratio and a lower level of physical fitness (Bogaert, De Martelaer, Deforche, Clarys, & Zinzen, 2014). Health problems were not the only limiting issues; other circumstances, such as individual characteristics and contextual factors, could limit work ability, too (Jansson, Björklund, Perseius, & Gunnarsson, 2015).

3. Research Questions

The main research question is if perception of the work ability correlates with the age of employees in primary education in both surveyed school units. Age and work capacity influence each other firstly according to individual and organizational characteristics of each school unit. We hypothesize that other individual variables (length of employment in school unit, level of education, weight, height and body mass index-noted B.M.I.) are likely not to correlate with the perception of work ability.

4. Purpose of the Study

The paper makes a comparative evaluation of the workers' work ability by age, length of employment in school unit, gender, and level of education in two education units in Maramures county: i.e. a kindergarten, and a college.

5. Research Methods

The correlations between the individual factors (age, gender, current position, level of studies, length of employment in school unit, weight, height, body mass index) and work ability noted WAI were evaluated through a questionnaire administered to the employees of a technical college and kindergarten. Work

ability was measured using the validated questionnaire of the Finnish Occupational Health Institute (2017) by the variable named work ability index (noted WAI) (EU OSHA, n.d.). During occupational medical check-up, scheduled and performed at the headquarters of the unit for 2 days in September 2019, workers were asked to volunteer filling in a questionnaire consisting of two parts: the first part contained individual characteristics (age, gender, current position, level of studies, length of employment in school unit, weight, height, body mass index) and WAI.

Data analysis (software) used were Epi Info v. 3.5.3, EXCEL 2010, SPSS v 16.0. Statistical tests used: Kruskal- Wallis test, Mann-Whitney test (U test), ANOVA, Kruskal-Wallis test and Spearman correlation coefficient (ρ) for correlations between questionnaire variables. The p value was significant at 0.05. For the statistical significance threshold, the following notation was used:

- ** . Correlation is significant at 0.01 level (2-tailed).
- * . Correlation is significant at 0.05 level (2-tailed).

For purposes of statistical processing, questionnaire answers to some variables were coded (Table 01).

Table 01. Coding used for statistical processing

Variable	Questionnaire answer	Coding used in statistical processing
Gender	Female Male	Female=0 Male=1
Education	A) Vocational school, B) High-school, C) Post-secondary school D) Higher education,	A= 1 B= 2 C= 3 D =4

6. Findings

72 employees from a total of 92 employees participated and returned questionnaires in the technical college. In kindergarten, 33 out of a total of 39 employees completed and returned the questionnaires.

The age of the employees correlates negatively, significantly, with the self-perceived work capacity of the worker both in the college employees ($p = 0,037$) and in the kindergarten ($p = 0.018$). Age correlates negatively with the level of education both for kindergarten and college employees.

In both educational units, the higher the age of the employees, the lower the level of education and the self-perceived work capacity.

In college, there were 20 male employees and 50 female employees, while in kindergarten one employee was male and 32 were female employees. Distribution on employees by position in college and kindergarten shows the prevalence of teachers in both school units (Table 02).

Table 02. Distribution on employees by position in college and kindergarten Coding used for statistical processing

Position	College- Frequency	Kindergarten- Frequency
Auxiliary staff	5	0
Caretaker	1	8
Foreman	6	0
Guardian	2	0
Kitchen worker	4	2
Preschool teacher	0	18
Teacher	45	4
Worker	7	1
Total	70	33

In college caretaker, guardian, kitchen worker were all workers with low relative qualification while the foreman has teaching responsibilities. In kindergarten, he preschool teacher has teaching responsibilities. Thus, based on belonging to the professional group, the distribution of employees from the two units shows the prevalence of teachers (Table 03).

Table 03. Distribution on employees by professional group

Professional group	College	Kindergarten
Auxiliary staff	5	0
Teacher	51	22
Worker	14	11
Total	70	33

The **age** of the college employees differs significantly from the age of the kindergarten employees ($p=0.0003$). The employees' age presents the following characteristics:

-In college, mean value is 47.66 years with minimum value of 23 years, maximum value of 64 years and median values of 48 years (std. dev. of 9,6);

-In kindergarten, mean value is 39,51, minimum value of 33 years, maximum value of 62 years and median 38 years (std dev of 11,83).

In college age does not differ significantly by gender ($p=0.0573$), showing the following values:

-in men, age mean value is 51.1years (with minimum of 32 years, maximum of 64 years, and median value of 55.5 years);

-in women, age mean value is 46.28 years (with minimum of 23 years, maximum of 50 years, and median value of 46 years);

In kindergarten, only one male employee has the age of 27 years. in women, age mean value is 39.9 years (with minimum of 24 years, maximum of 62 years, and median value of 40 years).

For the **length of employment in school unit** variable, the following results were obtained:

In college, the mean value is 14.51 (with minimum of 1 year, maximum of 45 years, median of 12 years, and std. dev. of 11.73). In kindergarten, the mean value is 6.45 years (with minimum of 1 year, maximum of 18 years, median of 5 years and std. dev. of 5.12). Length of employment in school unit in college's employees is significantly higher compared with kindergarten employees ($p=0.0003$).

-In college, there are no significant differences according to gender ($p=0.445$). For men, the average value is 15.53 years (with minimum of 1 year, maximum of 45 years and median of 12 years). For women, the average value is 46.28 years (with minimum of 1 year, maximum of 38 years and median of 11 years).

- In kindergarten, for the employed women, the mean value is 6.4 years (with minimum of 1 year, maximum of 4,5 years, and a median value of 18 years), the male employee having 8 years of length of employment in school unit.

WAI shows the following results:

In college, the mean value for WAI is 46.6 (with minimum of 20, maximum of 49, median of 48 and std. dev. of 5.18). In kindergarten, the mean value for WAI is (with a minimum of 39, maximum of 49,

median of 48, and std. dev. of 4.03). These values do not differ significantly between the two school units, $p=0.13$).

-In college, there are no significant differences according to gender ($p=0.28$). In male employees, the average value is 45.55 while in female employees, the average value is 47.04.

- In kindergarten, in female employees, the mean value is 48, while in male employees it is 49.

Level of education shows the following results:

In college, the mean value for level of education is 3.49 (with minimum of 2, maximum of 4, median of 4, and std. dev. of 0.79). In kindergarten, the mean value for level of education is 3.31 (with minimum of 1, maximum of 4, median of 4, std. dev. of 1.47). These values do not differ significantly between the two school units ($p= 0.43$).

In college, the level of education does not differ significantly according to gender ($p=0.25$): in male employees mean value is 3.32 and in female employees mean value is 3.56. In kindergarten, female employees have the mean value of 3.29 for level of education, while the males have 4.

For the professional group, the following results were obtained:

In college, WAI does not differ significantly according to professional group ($p=0.3399$). In auxiliary staff, mean value for WAI is 47.2 (with minimum of 40, maximum of 49, median of 49 and std. dev. of 5.02), in teachers mean value is 47.1 (with minimum of 20, maximum of 49, median of 48, and std. dev. of 5.4) and in workers, mean value is 44.79 (with minimum of 37, maximum of 49, median of 45.5 and std. dev. of 4.17).

In college, length of employment in school unit does not differ significantly according to professional group ($p= 0.59$). In auxiliary staff, mean value for length of employment in school unit is 13.8 (with minimum of 2 , maximum of 23, median of 20, and std. dev. of 10.38); in teachers, mean value is 15.39 (with minimum of 1, maximum of 45, median of 12.5 and std. dev. of 12.23) and in workers, mean value is 11.71 (with minimum of 1, maximum of 26, median of 26 and std. dev. of 10.62).

In college, age does not differ significantly according to professional group ($p=0.81$). In auxiliary staff mean value for age is 47.2 (with minimum of 41, maximum of 55, median of 45 and std. dev. of 5.4), in teachers mean value is 47.29 (with minimum of 23, maximum of 64, median of 46 and std. dev. of 10.43), and in workers, mean value is 49.14 (with minimum of 33, maximum of 58, median of 49 and std. dev. of 7.7).

In college, B.M.I. does not differ significantly according to professional group ($p=0.42$). In auxiliary staff, mean value for B.M.I. is 28.12 kg/m² (with minimum of 24 kg/m², maximum of 33.1 kg/m², median of 26.6 kg/m² and std. dev. of 4), in teachers mean value is 25.63 kg/m² (with minimum of 19 kg/m², maximum of 36.4 kg/m², median of 25.2 kg/m² and std. dev. of 3.9) and in workers, mean value is 25.98 kg/m² (with minimum of 18.9 kg/m², maximum of 35.1 kg/m², median of 26,75 kg/m², and std. dev. of 4.6).

In college, weight does not differ significantly according to professional group ($p=0.9$). In auxiliary staff, mean value for weight is 76 kg (with minimum of 67 kg, maximum of 90kg, median of 68 kg and std. dev. of 11.47), in teachers mean value is 74.52 kg (with minimum of 55 kg, maximum of 133 kg,

median of 70 kg and std. dev. Of 17.45; in workers, mean value is 72.64 kg (with minimum of 50kg, maximum of 98 kg median of 72.5 kg and std. dev. of 13.39).

In college, height does not differ significantly according to the professional group ($p=0.28$). In auxiliary staff, mean value for height is 164cm (with minimum of 160 cm, maximum of 167 cm, median of 165 cm, and std. dev. of 2.7); in teachers, mean value is 170 cm (with a minimum of 158 cm, maximum of 192 cm, median of 167 cm and std. dev. of 8.6) and in workers, mean value is 167.43 cm (with minimum of 148 cm, maximum of 182 cm, median of 169.5 cm and std. dev. of 10.15).

In college, level of education differs significantly with the professional group ($p < 0.001$). In auxiliary staff, mean value for level of education is 3.4 (with minimum of 3, maximum of 4, median of 3, and std. dev. of 0.55); in teachers, mean value is 3.8 (with minimum of 3, maximum of 4, median of 4, and std. dev. of 0.13) and in workers, mean value is 2.15 (with minimum of 2, maximum of 4, median of 2 and std. dev. of 0.31).

In kindergarten, age does not differ significantly with the professional group ($p=0.84$). In teachers, mean value for age is 39.23 (minimum of 24, maximum of 62, median of 37.5 and std. dev. of 13.13); in workers, mean value is 40 (minimum of 28, maximum of 56, median of 40 and std. dev. of 9.26).

In kindergarten, the level of education differs significantly with professional group ($p = 0.002$). In teachers, mean value for level of education is 3.59 (minimum of 2, maximum of 4, median of 4 and std. dev. of 0.79) and in workers, mean value is 2.7 (minimum of 1, maximum of 4, median of 2 and std. dev. of 2.3).

In kindergarten, length of employment in school unit does not differ significantly according to professional group ($p=0.32$). In teachers, mean value for length of employment in school unit is 5.82 (minimum of 1, maximum of 18, median of 5.5 and std. dev. of 4.77) and in workers, mean value is 7.72 (minimum of 2, maximum of 16, median of 4 and std. dev. of 5.76).

In kindergarten, WAI does not differ significantly according to professional group ($p=0.38$). In teachers, mean value for WAI is 47.59 (minimum of 37, maximum of 49, median of 46 and std. dev. of 4.15) and in workers, mean value is 47 (minimum of 41, maximum of 49, median of 46.5 and std. dev. of 3.79).

In kindergarten, B.M.I. does not differ significantly with professional group ($p=0.79$). In teachers, mean value for B.M.I. is 25.49kg/m² (with minimum of 16kg/m², maximum of 39.6kg/m², median of 23.5 and std. dev. of 5.81) and in workers, mean value is 26.1kg/m² (with minimum of 18.6 kg/m², maximum of 34.4kg/m², median of 24.95kg/m² and std. dev. of 5.44).

In kindergarten, weight does not differ significantly with professional group ($p=0.9$). In teachers, mean value for weight is 70.33 (minimum of 48, maximum of 109, median of 68 and std. dev. of 15.75) and in workers mean value is 71 (minimum of 55, maximum of 97, median of 66.5 and std. dev. of 13.66).

In kindergarten, height does not differ significantly with professional group ($p=0.78$). In teachers, mean value for height is 166.28 (minimum of 153, maximum of 180, median of 165 and std. dev. of 6.35) and in workers mean value is 165.6 (minimum of 150, maximum of 172, median of 167 and std. dev. of 6.53).

Relative to the BMI, weight and height variables, the samples of the populations of the employees in the 2 schools have the following characteristics:

In college, mean BMI is 25.87 kg/m² (with minimum of 18.9 kg/m², maximum of 36.4 kg/m², median of 25.7 kg/m² and std. dev. of 4.05). In kindergarten, mean BMI is (with minimum of 16 kg/m², maximum of 39.6 kg/m², median of 27.9 kg/m² and std. dev. of 5.61). These values do not differ significantly between the two school units ($p=0.84$).

In college, mean value for height is 169.12 cm (with minimum of 148 cm, maximum of 192 cm, median of 167 cm and std. dev. of 8.75). In kindergarten, mean value for height is 166.06 (with minimum of 150 cm, maximum of 180 cm, median of 165 cm and std. dev. of 6.31). These values do not differ significantly between the two school units ($p=0.0839$).

In college, mean value for weight is 74.24 (with minimum of 50, maximum of 133, median of 69 and std. dev. of 16.2). In kindergarten, mean value for weight is 70.55 (with minimum of 48, maximum of 109, median of 67 and std. dev. of 14.81). These values do not differ significantly between the two school units ($p=0.2813$).

The significant correlations between the variables of the questionnaires in the two school units

In college, the significant correlations are the following:

"Age" variable correlates positively with the following variables: length of employment in school unit ($\rho=0.651^{**}$, $p<0.001$), Weight ($\rho=0.343^{**}$, $p=0.004$), B.M.I. ($\rho=0.255^{*}$, $p=0.033$) and negatively with WAI ($\rho=-0.250^{*}$, $p=0.037$) and level of education ($\rho=-0.287^{*}$, $p=0.018$). Length of employment in school unit correlates significantly only with age. Weight and B.M.I. have no other correlations. In addition to the correlation mentioned with age, WAI has only one significant, positive, correlation with level of education ($\rho=0.449^{**}$, $p<0.001$). The height of the employees correlates, positively, only with weight ($\rho=0.555^{**}$, $p<0.001$). Additional to those presented, weight correlates significantly positively with B.M.I. ($\rho=0.834^{**}$, $p<0.001$) and negatively with WAI ($\rho=-0.243^{*}$, $p=0.044$).

In kindergarten the significant correlations are the following:

"Age" variable correlates positively with the following variables: length of employment in school unit ($\rho=0.651^{**}$, $p<0.001$), weight ($\rho=0.343^{**}$, $p=0.004$), B.M.I. ($\rho=0.255^{*}$, $p=0.033$) and negatively with WAI ($\rho=-0.250^{*}$, $p=0.037$) and level of education ($\rho=-0.287^{*}$, $p=0.018$). Length of employment in school unit correlates significantly only with the age variable. The height of the employees clearly correlates only with weight ($\rho=0.555^{**}$, $p=0$). Additional to those presented, weight correlates significantly positively with B.M.I. ($\rho=0.834^{**}$, $p<0.001$) and negatively with WAI ($\rho=-0.243^{*}$, $p=0.044$). In addition to the correlation mentioned with age, WAI has only one significant, positive, correlation with level of education ($\rho=0.449^{**}$, $p<0.001$).

7. Conclusion

In order to contribute to overall community efficiency, the employee's knowledge of work ability correlation is important.

Although there are differences between the samples represented by the employees of the two school units, these results are consistent and underline that, in both educational units, with the employees' increase in age, the level of education is lower and the self-perceived work capacity significantly decreases.

Also, work ability correlates negatively with weight in both school units and suggests that the lower level of physical fitness or/and increased mass is/were associated with low values of work ability.

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