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## Original research article

# The Work Ability Index for persons aged 50+ as an instrument for implementing the concept of Age Management

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## ABSTRACT

This article addresses the issues of Age Management and the application of the Work Ability Index (WAI) for employees aged 50+. The objective of the study was to verify the potential of the application of an international European questionnaire method for the WAI identification in the Czech environment with the emphasis on the healthcare sector. The practical survey was conducted by a group of nurses and midwives of the Municipal Hospital in Ostrava and the employees of the company Vítkovice Reality Developments s.r.o. The results of the survey imply that healthcare workers scored poorer results in the Work Ability Index than non-healthcare workers. The authors concluded by stressing the need to implement the concept of Age Management as an instrument for staff management and for the maintenance and exploitation of the work ability of older staff members.

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## Introduction

Age Management represents the management of the age structure of employees at the level of the entire society, companies and individuals. Discussions in the field of Age Management encompass a series of topics related, in particular, to the demographic development of; population ageing, policies in old age pensions and retirement, social responsibility of companies, age discrimination, employment of the older generation, mainly for the “50+” group. Age Management incorporates the corporate strategy in the area of employment with respect to the age, abilities and the potential of employees, their age

diversity, harmonisation of personal and professional life (work-life balance), alternative workloads, the health and the life style of employees and, in keeping with the strategy of intergenerational knowledge transfer, also talent management and succession planning in companies. A critical aspect of Age Management is support for young families, the harmonisation of work with family life and child care through a suitable modification of working hours, very often involving the cooperation with older co-workers. Age Management represents the development and management of programmes, strategies and procedures addressing the demographic changes in the workforce aimed at promoting the age diversity at workplaces, hiring and employing both older and younger employees, knowledge

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transfer, support for health and a good atmosphere. The Age Management practice is characterised as a system of measures combating age barriers and/or promoting age diversity and activities ensuring that each employee gets a chance to fulfil their potential and is not being discriminated against because of their age. The concept of Age Management is based on the practical application of the findings of longitudinal research conducted by the Finnish Institute of Occupational Health (FIOH). Its objective was to conduct research into the health, functional capacity, work ability, working environment and stress of employees over the age of 45. To measure work ability, a novel method was devised, a questionnaire leading to the identification of the Work Ability Index (WAI) [1] (this questionnaire was translated into the Czech language by Lucie Štorová within the project “*Strategy of Age Management in the Czech Republic*” [2]). It includes seven (7) dimensions each of which is evaluated using one or more questions. The total WAI value is calculated as the sum of points reached for individual dimensions [3, 2, 4, 5, 6, 7].

This work was done as a master thesis in the field of Systematic integration of processes in health care. Its main objective was to prove the applicability of the wide-spread international questionnaire [1] to measure the WAI in the Czech environment, including the reaction of human resources managers (previous research involved only job seekers registered with the Employment Office [2, 7]). Due to the field of study, one company was chosen in the health care field, while the other was outside this sector to allow for comparisons.

### **Potential at work and work ability of 50+ employees**

Although Age Management may be studied as a more general (holistic) management concept, it goes without saying that it primarily focuses on the work abilities of employees in terms of their age. Work ability is generally considered to be the key feature for both employees and their employers. According to the Finnish researchers Ilmarinen and Tuomi [1, 8], work ability may be understood as “the employee’s quality at present, in the near future and to what extent they are or will be able to perform their work with respect to the demands set on them (in terms of their physical and mental health)”. Work ability is closely related to the employee’s potential at work, since work ability may be expressed as the ratio of two variables: the potential at work and the requirements for work. The potential for work may be understood as a set of individual’s significant abilities for work, while the potential is not related to any specific work. In simplified terms, we may say that the potential for work is what an individual can do and what abilities they have available. Considering the range of the potential at work, there is no such work or occupation whose performance requires the entire individual’s potential for work, but always only a part of some ability and quality is involved [9, 10]. Working conditions may set different demands on a person that may be both adequate and inadequate in relationship to the human potential at work. If the demands set by work are inadequate to the individual’s potential at work, this

may result in damage to the individual’s health, an illness or a loss of the ability to work.

The potential at work has two other components, the physical potential and the qualification potential. The term physical potential is understood as a set of intellectual, physical and sensual abilities that are important for work and give us an idea of the performance of an individual organism. The qualification potential includes the education completed by an individual, their knowledge and experience, but also the requalification ability, skills, motivation, the level of education and ability to learn new things. The potential at work of 50+ persons should be supported by employers by offering them additional qualification growth and requalification, by modifying their working hours and shortening their workload. Work ability is the basis for the quality of work. The aspects affecting the staying of older employees in employment contracts involve health, professional abilities, motivation, the content of work and working conditions. It is essential for organisations to mediate the effective transfer of experience and skills from the older generation to the younger one [11, 12].

## **Material and methods**

The Work Ability Index was originally devised for use in corporate preventive care for monitoring at both the individual and the group level. Thus far, work abilities have been primarily studied in older employees (50+), but recent research studies have pointed out the growing difficulty in mastering the demands for work even among younger employees. Therefore, the focus on their work abilities has also been gaining ground [13, 14]. The Work Ability Index primarily serves as a support for employees. The index may be applied in an early phase to assist in identifying the hazards behind a drop in productivity, or to the contrary, as a checking tool for the verification whether correct measures have been taken for the work ability maintenance. The advantage of the index is its easy and fast flexibility and applicability for both monitoring at an individual and a group level. The data are confidential and, at an individual level, they are only used for the purpose of occupational healthcare services. The WAI questionnaire is available in two versions. In the complex version, filled in by occupational healthcare service doctors, individual diseases are listed within basic groups. For the purposes of this study, a shortened version has been used that may also be filled in by a non-medical specialist. It only contains the basic groups of the International Classification of Diseases stating further the total number of diseases. The WAI evaluation ranges between 7 and 49 points. The work ability is considered as low in the range of 7–27, average in the range of 28–36, good in the range of 37–43 and excellent in the range of 44–49 points. Employees scoring 37 points and more are classified as individuals with satisfactory work ability.

The work ability survey by means of the WAI questionnaire was conducted for a group of nurses and midwives of the Municipal Hospital in Ostrava ( $n =$

53) and for the staff members of the Vitkovice Reality Developments s.r.o. company, whose content of work is primarily technical facility management ( $n = 54$ ) in February and March 2014. Basic characteristics of the sample are given in Table 1. The statistical processing was performed using the Statistica 12 and R programmes.

**Table 1 – Sample description**

	Vítkovice Reality Developments s. r. o.		Municipal Hospital in Ostrava	
	Number	%	Number	%
Average age	56.2		55.7	
Sex				
Male	48	88.9	0	0.0
Female	6	11.1	53	100.0

Table 2 presents the areas included in the Work Ability Index, the number of questions used for the evaluation of each item and the evaluation of answers.

In area 2 (work ability in relationship to demands for work), work ability is assessed in relationship to the physical and intellectual demands for specific work. The response to a question is weighted depending on whether the work is primarily of physical or primarily of an intellectual nature. For work which is demanding (both physically and intellectually), such as nursing or dentistry, the Work Ability Index does not change.

## Results

The objective of the survey was to discover the relationship between the sex, age, the number of diagnosed diseases

and demands for work for individual areas of the Work Ability Index for a group of nurses and midwives and for the staff of the Vitkovice Reality Developments s.r.o.

The group of nurses and midwives scored an average Work Ability Index of 36.3 points with a standard deviation of 6.1; this WAI score is evaluated as average work ability. The lowest index was measured at a value of 24 points (low work ability) and the highest at 49 points (excellent work ability), which is the highest score possible (see Table 3 that shows also results in each investigated area).

The representation of nurses and midwives regarding their age was between 51 and 62 years. The lowest average Work Ability Index was identified for employees aged 62, amounting to 28.8 points with a standard deviation of 4.4. This corresponds to an average work ability. The highest average index was reached for employees aged 52, amounting to 42.0 points with a standard deviation of 4.2, which corresponds to good work ability.

The group of the employees of the Vitkovice Reality Developments s. r. o. scored an average Work Ability Index of 42.6 points with a standard deviation of 3.4, which is evaluated as good work ability. The lowest index was measured at a value of 34 points (average work ability) and the highest at 49 points (excellent work ability), which is again the highest score possible (see Table 4 that shows results for each investigated area). The representation of the respondents regarding their age, ranged from 50 to 69 years. The lowest average Work Ability Index was measured for employees aged 52 and 63 amounting to 39.0 points. This corresponds to good work ability. The highest average index was measured for employees aged 64 in the value of 49.0 points.

To identify the difference in the results of the Work Ability Index for the employees of the Municipal Hospital in Ostrava and the Vitkovice Reality Developments s. r. o. company, the following null hypothesis  $H_0$  was formulated:

**Table 2 – Areas included in the Work Ability Index, number of questions used for the evaluation of each answer and the evaluation of answers [1]**

Areas	Number of questions	Evaluation of answers
1. Current work ability compared to the best work ability	1	0–10 points (value circled in the questionnaire)
2. Work ability in relation to demands for work	2	A weighted average depending on the type of work
3. Diagnosed diseases	1 (list of 51 diseases)	No disease = 7 points 1 disease = 5 points 2 diseases = 4 points 3 diseases = 3 points 4 diseases = 2 points 5 and more diseases = 1 point
4. Estimated drop in work performance	1	1–6 points (value circled in the questionnaire)
5. Absence due to illness	1	1–5 points (value circled in the questionnaire)
6. Work ability prognosis	1	1 or 4 or 7 points (value circled in the questionnaire)
7. Mental health	3	Points for questions in this part are added up and the sum is recalculated as follows: Sum 0–3 = 1 point Sum 4–6 = 2 points Sum 7–9 = 3 points Sum 10–12 = 4 points

**Table 3 – Specific values in the Work Ability Index areas identified for midwives and nurses in the Municipal Hospital in Ostrava (the last line lists actually reached total values for WAI, not sums of previous lines)**

Areas	Descriptive statistics (midwives + nurses)					
	Number	Median	Mean	Standard deviation	Min.	Max.
Current work ability	53	7	7.5	1.2	5	10
Work ability in relation to demands for work	53	7	7.3	1.3	6	10
Diagnosed diseases	53	4	4.5	1.4	2	7
Estimated drop in work performance	53	5	5.2	0.8	3	6
Absence due to illness	53	4	3.9	1.2	2	5
Work ability prognosis	53	4	4.9	2.0	1	7
Mental health	53	3	2.9	0.8	2	4
<b>Work Ability Index</b>	<b>53</b>	<b>37</b>	<b>36.3</b>	<b>6.1</b>	<b>24</b>	<b>49</b>

**Table 4 – Work Ability Index values identified for employees of Vítkovice Reality Developments s. r. o.**

Areas	Descriptive statistics of Vítkovice Reality Developments s. r. o.					
	Number	Median	Mean	Standard deviation	Min.	Max.
Current work ability	54	8	8.0	1.2	5	10
Work ability in relation to demands for work	54	9	8.9	1.1	6	10
Diagnosed diseases	54	5	5.1	1.2	3	7
Estimated drop in work performance	54	6	5.8	0.5	4	6
Absence due to illness	54	5	4.8	0.5	3	5
Work ability prognosis	54	7	6.7	1.1	1	7
Mental health	54	3	3.3	0.6	2	4
<b>Work Ability Index</b>	<b>54</b>	<b>42.3</b>	<b>42.6</b>	<b>3.4</b>	<b>34</b>	<b>49</b>

**Table 5 – The test of agreement (or difference) of the Work Ability Index in both firms**

	Work Ability Index (mean)	Standard deviation	Shapiro-Wilk normality test <i>p</i> value	<i>t</i> -test <i>p</i> value
Municipal Hospital in Ostrava	36.3	6.2	0.1788	$1.708 \times 10^{-09}$
Vítkovice Reality Developments s. r. o.	42.6	3.4	0.3135	

There is no difference in the results of the Work Ability Index between the employees of the Municipal Hospital in Ostrava and the Vítkovice Reality Developments s. r. o.

The Shapiro-Wilk Test was first used to verify the normality of both data sets. Due to the fact that the normality of the data was not denied, both sets were compared by means of the Student's *t*-test. The hypothesis  $H_0$  was denied by means of this test; thus differences in the index between both firms were manifested ( $p < 0.001$ ). The results of the tests are presented in Table 5.

## Discussion

To solve the issues of population ageing as a consequence of the demographic development, the National Action Plan supporting positive ageing for the period of 2013 to

2017 (hereinafter the “NAP”), which is the fundamental strategic document addressing the problems of seniors and population ageing, was developed and approved by the Czech Government in February 2013. Priorities of the NAP include: (1) provision and protection of human rights of older persons; (2) lifelong learning; (3) employment of older workers and seniors in relation to the pension scheme; (4) volunteering and intergenerational cooperation; (5) the quality living environment for seniors; (6) healthy ageing; and (7) care for the elderly with reduced self-sufficiency. An important part should be promoting a healthy lifestyle and disease prevention as essential prerequisites for improving the quality and prolongation of active life in old age.

Among its priorities, there is promotion for the concept of Age Management. Such changes in the legislation should be adopted to facilitate the introduction and dissemination of Age Management. The emphasis is on the consideration

of the possibility of introducing a flexible retirement system, introducing financial incentives for employers supporting the development of flexible forms of work respecting the needs of older staff members and school graduates, defining new flexible forms of work in the Labour Code and creating conditions for their application, which will help employers in their implementation, revision of Health and Safety (H&S) regulations with respect to the ageing of employees [15, 16].

The concept of Age Management is primarily based on the creation of conditions for the employment of older persons, support for lifelong learning, enhancing the quality of life and a mutually beneficial intergenerational dialogue [6, 17, 18, 19].

The aim of the survey was to verify and evaluate the application of the Work Ability Index in two types of firms, in particular for the employees in the Municipal Hospital in Ostrava and the workers of the Vítkovice Reality Developments s. r. o. It represented a pilot study regarding the implementation of the Work Ability Index in a specific corporate application concentrating on a healthcare facility similar to a hospital. Although a similar research study had already been carried out in the Czech Republic in 2011, where the WAI questionnaire translation was verified on individuals in the 50+ age group, the achieved results cannot be mutually compared, since the research involved job seekers registered with Employment Offices [2, 7]. The position of a job seeker principally affects the self-assessment of one's own work ability.

The average score of the Work Ability Index reached in the nurses and midwives was 36.3 points. This score corresponds to the average work ability for which measures supporting work ability are taken (recommended). The age of the female respondents ranged between 51 and 62 years, with an average of 55.9 years. There were only three men in the group of respondents, which is statistically insignificant, thus, we can only present the results of the survey as a survey among women. Foreign studies on measuring work ability of nurses concerned only groups of women as well.

The surveyed group involved testing both demands for intellectual work and the combination of intellectual and manual work. Concerning intellectual demands, the Work Ability Index reached 39.6 points. For both intellectual and manual demands, the index dropped to 35.8 points. By comparison with the study conducted in Portugal [20] where 238 nurses at an average age of 34.3 years scored an average index of 38.7. The average index reached by our surveyed group of nurses and midwives was only 2.4 points higher. In a study conducted in Israel [21], where the survey involved 515 nurses, the female respondents scored an average index of 41.8 points. The Work Ability Index negatively correlated with the age and the number of diagnosed diseases, while for Czech nurses there was only a negative correlation with the number of diseases. Considering the lower Work Ability Index in terms of physical or intellectual demands for work, it may be accounted for by the nature of the work in hospital wards. People working in physically demanding professions tend to have a lower Work Ability Index than people working in intellectually demanding professions [22]. Apart from

this, the drop in work ability in the case of nursing staff is accelerated as a consequence of several factors present at their workplaces [23], such as the level of the patients' dependence on the staff, the number of staff, the layout of rooms, shift work, and other factors. For example, in the Portuguese study [20], it was discovered that the layout of the workplace was considered inappropriate by the majority of employees. The staff members mentioned specific drawbacks like insufficient equipment with mechanical devices for lifting patients, who had to be moved instead by manual handling.

The Finnish study [1] identified the reference value for intellectual demands for the work of nurses (aged 55 years) at 37 points. For our nurses in this age category, the Work Ability Index had a value of 45 points. The work of nurses is mentally and physically demanding. Nurses are highly vulnerable to the damage that chronic stress has on the body, and to the burnout syndrome. The high degree of stress loads has been amplified also by the continuously increasing paperwork demands, permanent changes in hospital processes, and by aggressive patients.

As for both intellectual and physical demands, the reference value identified for the age of 55 years was 35 points, while for the age of 58 years it was 34 points. The nurses from the Municipal Hospital in Ostrava scored an average index of 40.5 points at the age of 55, and 32 points at the age of 58. The results showed that they had reached better results at the age of 55, but at the age of 58 they scored below the reference value. This may be caused by the fact that health problems appear most frequently right after reaching the 55th year of life and later.

The average score of the Work Ability Index reached by the group of employees of the Vítkovice Reality Developments s. r. o. was 42.6. This score corresponds to good work ability, where the typical measure taken is support for work ability. The surveyed group included 48 men, who scored an average index of 42.6 points. The group included a small percentage of women, only six. Their average index reached a value of 42.1 points. The representation of the employees regarding their age was between 50 and 69 years. The lowest average index was recorded at the age of 59 and 63. The results for this surveyed group did not confirm the assumption that the average Work Ability Index falls with increasing age: just the opposite was actually true; the average index for the oldest age categories (ages 64, 65, and 69) was at the level of good work ability and excellent work ability. Furthermore, it was discovered that the Work Ability Index fell with the growing number of diseases. Demands for only intellectual work and both intellectual and physical work were represented by the respondents. Purely physical work was not found in the surveyed group. Due to the demands of work, the highest average index of 43.3 was identified for the staff members who did solely intellectual work. The index fell to 41.6 points for employees doing both intellectual and physical work.

As compared to the Finnish study [1] and its reference values, the employees from the Vítkovice Reality Developments s. r. o., invariably scored higher values than those in the Finnish study.

The content of work for the employees from the Vítkovice Reality Developments s. r. o. is completely different from the content of work of the employees from the Municipal Hospital in Ostrava. In total, corporate staff scored a higher average Work Ability Index than healthcare staff. Work in the healthcare sector sets much higher demands both physically and intellectually. Nurses are exposed to 24 h a day contact with patients demanding social communication. Due to the application of the shortened version, however, a potential distortion of the respondents' results must be taken into account. The WAI questionnaire exists in two versions, in a complex version and a shortened version. The complex version is applied by occupational physicians, while non-medical specialists apply the shortened version. It is often discussed in open literature whether the WAI score is the same in both cases. This issue was studied by Geisler, Tempel and Geisler-Gruber [24]. They came to the conclusion that non-medical specialists can conduct the WAI-based survey only after they have been instructed by an occupational physician or an expert experienced in using WAI.

## Conclusion

Thanks to a series of follow-up programmes implemented in Finland in 1998–2003, the employment rate in the age category of 55–64 years improved, the actual retirement age was increased and discrimination due to age fell more in Finland than all other EU countries. Numerous studies contributed to the understanding of the factors related to work ability and accounted for their effect on both professional and personal life. All of the above mentioned experiences may be highly inspiring and widely applicable in the Czech Republic. Therefore, it seems beneficial to analyse the existing results of research studies focusing on work ability implemented by research workplaces in both the European Union and worldwide.

The promotion of a new approaches of a society to deal with ageing requires the cooperation of a wide range of institutions, the general public and other stakeholders. Regarding the work ability concept, it no longer represents just the worker's state of health reflected in their job performance. In the past decades there has been a departure from the medical concept towards the now dominating multidimensional approach. Thus, work ability may be viewed from different perspectives: medical, psychology and management. Hence, according to the current concept, work ability is characterised by many factors related to professional life, associated with the respective individuals and their place of work, the work itself, the social environment or society in general. The WAI self-assessment questionnaire is based on the fact that it is only the employees themselves who can easily sum up the diverse factors contributing to their work ability. The work ability determined by means of WAI should be able to help preserve, restore and support the work ability of employees in companies. It may detect risk groups in the initial phase and timely formulate preventive measures. Therefore, WAI is primarily suited for ensuring health

and safety. The collected data are confidential and, at an individual's level, they are solely used for the purposes of occupational healthcare services.

For both surveyed groups of persons in the 50+ age category, external conditions were identical, but the workload and the content of work significantly differed. The identified WAI results and their comparison showed that the work of medical staff is physically and mentally so demanding that it reduces the value of the Work Ability Index. Similar diseases cause a much greater decline in WAI in healthcare workers than the workers of the Vítkovice Reality Developments s. r. o. Compared to the results of foreign studies, however, both groups primarily scored higher values.

The key role in the implementation of the concept of Age Management falls undoubtedly with the employers and the working conditions they generate. A similar important role for the employers in promoting a change in the approach to work ability in connection with ageing is that of Employment Offices and other state administration authorities. The work ability concept also includes motivation and the employee's state of health, which is reflected in their job performances. Therefore, the Age Management promotion also assumes changes in the concept of occupational healthcare.

## Conflict of interest

The authors have no conflict of interest to disclose.

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