

## WORK ABILITY AND PSYCHOSOCIAL FACTORS IN HEALTHCARE SETTINGS DURING COVID-19 PANDEMIC – SPECIFIC FOCUS ON AGEING WORKERS

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**Abstract.** The paper aims to find out what kind of impact socio-demographic and psychosocial factors have on the work ability among healthcare workers during COVID-19 pandemic – specific focus on ageing workers. Work Ability Index (WAI) and the short version of the Copenhagen Psychosocial Questionnaire (COPSOQ-III) were used to analyse the impact. 424 healthcare workers from Georgian and Estonian hospitals (including doctors and nurses) answered the questionnaires. On average, the sample had a good work ability, with 48.8 % viewing it as good and 29.3 % as excellent in Georgia, and 53.6 % of participants had a good and 15.4 % excellent work ability in Estonia. The COPSOQ showed critical values in the scales of “work pace” and “emotional demands”. These results were expected as the data were collected during the pandemic period. “Sleep troubles”, “burnout”, “depressive symptoms”, and “insecurity over working conditions” were the risk factors more likely associated with ageing (+55) health workers than younger ones. The scales “quantitative demands”, “work pace”, “job insecurity”, “burnout”, “stress”, “sleep troubles”, “offensive behaviours” and “depressive symptoms” were in negative correlation with WAI. The results show that the work ability is higher when these factors are lower. The scales “role clarity”, “recognition”, “sense of community at work”, “quality of leadership”, “organisational justice”, “self-efficacy”, “meaning of work”, “job satisfaction” and “possibilities for development” were the risk factors in positive correlation with WAI, thus acting as work ability preservative aspects.

**Keywords:** Ageing, COPSOQ III, COVID-19, healthcare workers, hospitals, work ability index (WAI).

**JEL Classification:** I1, J0

### INTRODUCTION

Healthcare workers (HCWs) have the leading role in service provision for the country's population. Their job is essential for the preservation of healthy societies (Osei-Yeboah et al., 2018). The rapid ageing of the workforce is reflected in an estimated share of HCWs who were aged 55 years or over (Eurostat, 2019). Increasing interest has been shown in the possibilities of extending working lives, the influence of ageing on Occupational Health and Safety, and on the Work Ability Index (Bohle et al., 2010; Smyth et al., 2018; Martinez & Fischer, 2019; Varianou-Mikellidou et al., 2019; Mateo-Rodríguez et al., 2021a).

Musculoskeletal system diseases and mood disorders are the main health problems among ageing HCWs (Lačokova-Krasnikova et al., 2020). According to the studies, health, ageing, lifestyle and work deeply affect work ability (Seitsamo & Ilmarinen, 1997; Ilmarinen et al., 2005; Fischer et al., 2006), which is strongly associated with psychosocial factors (Mokarami et al., 2020). Different studies show that with ageing, work ability of nurses declines (Chiu et al., 2007; Golubic et al., 2009; Cotrim et al., 2011; Abbasi et al., 2017). Studies conducted among ageing HCWs demonstrate the high prevalence of poor and moderate WAI (Monteiro et al., 2006; Mateo-Rodríguez et al., 2021b). While exposure to physical hazards is a common contributor to HCWs' poor health and decreased work ability (Cotrim et al., 2011; Ou et al., 2021), research illustrates that psychosocial work-related factors are also influential (Francisco et al., 2012; Rongen et al., 2014; Freimann & Merisalu, 2015; Mokarami et al., 2020). The psychosocial conditions of workers are connected to the company's economic outcomes, above all, to the increasing costs due to accidents at work (Nielsen et al., 2010; Torá et al., 2015; Hassard et al., 2014). Successful management of psychosocial risks in healthcare settings is related to worker's motivation, contentment, and healthy working conditions (Franklin & Gkiouleka, 2021).

HCWs are part of the population that is strongly affected by the new COVID-19 strain accompanying mental health difficulties (Greene & Gibson, 2021; Buselli et al., 2020). One of the recent studies by Buselli et al. (2020) identified that rapid changes in work organisations were crucial to enhance psychological durability and increasing the healthcare system's efficiency. Research shows that an increasing proportion of HCWs encounter mood and sleep troubles, indicating the importance to create strategies for decreasing mental health risks and adapting interventions accordingly (Pappa et al., 2020; Sepp et al., 2019). Also, nurses and doctors encountered problems and challenges by working in a totally new situation. They described tiredness because of long working hours, the fear of infection, and the feeling of inability to control patients' critical conditions (Liu et al., 2020). Occupational stress has become a significant public health issue to deal with (Pappa et al., 2020; Orsini et al., 2020; Buselli et al., 2020; Baldwin & George, 2021) but, currently, few studies have addressed occupational health among HCWs and how it influences work ability. There is little evidence of whether there are specific psychological difficulties for older workers on a day-to-day basis, in addition to the challenges faced by all health workers (Fragar & Depczynski, 2011; Charles & Wen, 2021). To address these gaps, we have conducted a quantitative study in Estonia and Georgia – two Eastern European countries which face similar challenges among healthcare workforce yet have their own peculiarities to handle. This paper aims to find out what kind of impact socio-demographic and psychosocial factors have on the work ability among healthcare workers during COVID-19 pandemic – specific focus on ageing workers.

HCWs' shortage in Estonia is caused by older workers who retire, professional migration, and insufficient training opportunities that originated from the past (Habicht et al., 2018). Ratio of working medical doctors per population in Estonia is lower than the average of the EU28 level, but the deficiency of nurses is alarming (Eurostat, 2019). The situation concerning HCWs in Georgia is highly

disorganized. The oversupply of doctors and shortage of nurses make changing the skill mix extremely difficult. The excessive supply of doctors also has serious consequences on productivity (Richardson & Berdzuli, 2017). Historically, there have been problems with the quality of medical education in Georgia (Chanturidze et al., 2009). The situation is much more worrisome after the start of the pandemic. At the time when this research began, there were only a few studies available to inform how health professionals had to be supported to maintain and/or enhance their physical and mental health, well-being, and work ability throughout working life, especially under current crisis time (e.g., Covid-19). While doing research in those two countries, we can assume that the results can be transferred to other countries with similar backgrounds, such as the Baltic States and other Eastern European countries with similar backgrounds.

In this study, we define “ageing worker” as proposed by the United Nations Economic Commission for Europe (UNECE). The Commission has calculated the Active Ageing Index, which includes persons from 55 years (UNECE / European Commission, 2019). For the definition of the “Healthcare workers”, International standard classification of occupations (ISCO-08) was used. Our studied cohort included medical doctors and nursing staff.

## 1. METHODOLOGY

### 1.1. Data Collection and Processing

Online questionnaires (socio-demographic data; the Work Ability Index; and the Copenhagen Psychosocial Questionnaire III – short version) were self-administered during January and February 2022 among Georgian and Estonian healthcare workers. The authors compared the results among younger and older staff (over 55 years) to determine special characteristics associated with ageing healthcare workers (Table 1).

**Table 1.** Socio-Demographic Data (Georgia and Estonia)

Socio-demographic data		Georgia		Estonia	
		N	%	N	%
Professional Group	Doctors	150	69.5 %	99	47.4 %
	Nurses	65	30.5 %	110	52.6 %
Gender	Women	195	90.7 %	180	85.7 %
	Men	20	9.3 %	29	14.3 %
Civil Status	Single	39	18.1 %	34	16.3 %
	Married	135	62.8 %	103	59.6 %
	Widowed	34	15.8 %	1	0.5 %
	Divorced	7	3.3 %	18	8.6 %
	Cohabiting	-	-	53	25.4 %

Doctors and nurses working at public and private hospitals were invited to participate through media advertisements, social networks, and e-mails during the COVID-19 outbreak period; 424 workers were included in the cohort: 215 from Georgia – 30.5 % of nurses and 69.5 % of doctors; 209 from Estonia – 47.4 % of doctors and 52.6 % of nurses

Data were collected through standardized questionnaires using Google Forms. Thus, the sample was selected by convenience based on the voluntary response of the participants.

## 1.2. Methods, Procedures and Statistical Analyses

Work Ability Index (WAI) and the short version of the Copenhagen Psychosocial Questionnaire (COPSOQ-III) were used to analyse the impact of the socio-demographic and psychosocial factors on the work ability among healthcare workers during COVID-19 outbreak.

WAI is composed of questions regarding work, work ability and health. The WAI is an instrument used in occupational health and research to assess work ability. The validity and reliability of the WAI are assessed in correlation analyses. The WAI expresses the subjective assessment of the worker's fitness for work. This tool was used by the Finnish Institution of Occupational Health (FIOH) many times. In longitudinal studies, WAI allowed predicting changes in the ability to work in different professional groups (Rypicz et al., 2021). Also, the WAI provides a basis for future corrective and preventive action to improve or maintain employability. The best possible rating on the index is 49 points and the worst is 7 points. It classifies workers as having poor, moderate, good, or excellent work ability.

The Copenhagen Psychosocial Questionnaire III short version was used to analyse psychosocial risk factors. COPSOQ is an instrument for research, for the assessment of psychosocial conditions and health promotion at workplaces. The COPSOQ has been translated into at least 25 languages and has been validated in a number of countries worldwide (Berthelsen et al., 2018). It was created by researchers Tage S. Kristensen and Vilhelm Borg at the Danish National Research Centre for the Working Environment. The majority of items of COPSOQ III were scored according to a 5-point Likert scale.

The data obtained during the surveys were collected and systematized using Microsoft Office Excel spreadsheet tools. Descriptive statistics were performed to calculate mean scores and standard deviations.

Cross-sectional correlations between work-related psychosocial risk factors and work ability index were analysed using Pearson's *r* correlation.

## 2. RESULTS

In general, the sample had a good work ability [ $40.22 \pm 4.88$ ] in Georgia, [ $39.03 \pm 4.55$ ] in Estonia, with 48.8 % viewing their work ability as good and 29.3 % as excellent in Georgia (Table 2) and 53.6 % of participants had a good work ability and 15.4 % of participants had an excellent work ability in Estonia (Table 2).

**Table 2.** Work Ability Categories (Georgia and Estonia)

Work Ability Categories	Georgia		Estonia	
	N	%	N	%
Poor	3	1.4 %	3	1.4 %
Moderate	44	20.5 %	62	29.6 %
Good	105	48.8 %	112	53.6 %
Excellent	63	29.3 %	32	15.4 %

Only 1.4 % of healthcare workers both in Georgia and Estonia had poor work ability. WAI was not correlated with age ( $r = -0.02$ ;  $p = 0.312$ ) (Table 2). Results show a decreased WAI with age, but also a higher mean WAI among participants under 24 years old in Georgia [ $45 \pm 2.83$ ] (Table 3), and among 55+ in Estonia [ $40.11 \pm 4.91$ ].

**Table 3.** Work Ability Index by Age Group (Georgia)

Age Group	N	min-max	mean	sd
Under 24	5	40–46	45	2.83
25–34	28	33–46	38.89	3.77
35–44	13	23–45	36.85	6.68
45–54	53	31–49	40.21	4.65
55+	116	24–49	40.74	4,82

Men had a lower mean WAI [ $38.47 \pm 3.38$ ] compared with women [ $40.41 \pm 5.02$ ] in Georgia, but higher in Estonia – women [ $38.77 \pm 4.61$ ], men [ $40.29 \pm 4.10$ ]. If we study the overall sample, men had a little bit higher mean WAI [ $39.7 \pm 3.89$ ] compared with women [ $39.54 \pm 4.9$ ]. The two-tailed  $P$  value equals 0.8246,  $T = 0.2217$ , by conventional criteria, this difference is considered to be not statistically significant.

**Table 4.** Work Ability Index by Age Group (Estonia)

Age Group	N	min-max	mean	sd
Under 24	17	27–45	39.29	3.27
25–34	55	31–47	39.00	4.09
35–44	53	25–47	38.00	4.45
45–54	35	26–49	38.93	5.35
55+	49	29–49	40.11	4.91

As regards the perception of the work demands, 69.3 % reported their work demands as physical and mental, and 30.7 % as mental in Georgia. Doctors and nurses who reported physical and mental demands showed a higher WAI [ $40.58 \pm 4.85$ ] and varied from the group reporting just mental demands ( $p < 0.001$ ). In

Estonia, 78.47 % of participants reported work demands as physical and mental and 21.53 % as only mental. HCWs who reported both showed a higher WAI [ $38.78 \pm 4.46$ ] and varied from the group that reported just mental demands ( $p < 0.001$ ).

**Table 5.** Work Ability Index by Professional Group (Georgia and Estonia)

Professional Group	WAI (Georgia)				WAI (Estonia)			
	N	min-max	mean	sd	N	min-max	mean	sd
Doctors	150	24–49	40.10	4.12	99	27–49	39.85	4.54
Nurses	65	23–49	40.46	6.26	110	25–49	38.26	4.45

With respect to the Work Ability Index by professional group (Table 5), the mean WAI is pretty much similar for both professional groups in both countries. *sd* is higher for Georgian nurses and lower for Georgian doctors, which indicates that nurses have a larger variance in their answers.

## 2.1. Psychosocial Factors

The scales of work pace [ $3.82 \pm 0.66$ ] and emotional demands [ $3.85 \pm 0.95$ ] in Georgia and Estonia showed critical values (Table 6). It was an expected result, as the data were collected during the pandemic and other studies also presented the same results regarding working demands.

**Table 6.** COPSOQ Subscale Distribution in Georgia and Estonia (the critical value is the highest)

Scales	Total (Georgia)				Total (Estonia)			
	№ of items	min-max	mean	sd	№ of items	min-max	mean	sd
Quantitative demands	2	1–5	2.4	0.80	2	1–5	2.45	0.70
Work pace	2	1–5	3.82	0.66	2	1–5	3.75	0.88
Emotional demands	2	1–5	3.85	0.95	2	1–5	3.80	0.97
Role conflicts	2	1–5	2.75	0.60	2	1–5	2.88	0.55
Job insecurity	2	1–5	2.87	0.85	2	1–5	2.88	0.89
Self-rated health	1	1–5	3.33	0.77	1	1–5	3.23	0.78
Work-life conflict	2	1–5	2.77	0.89	2	1–5	2.55	0.89
Sleep troubles	4	1–5	2.44	0.89	4	1–5	2.44	1.03
Burnout	4	1–5	2.66	0.89	4	1–5	2.87	0.90
Stress	3	1–5	2.55	0.77	3	1–5	2.75	0.80
Depressive symptoms	4	1–5	2.40	0.77	4	1–5	2.25	0.78
Negative acts (Offensive behaviours)	7	1–5	1.22	0.23	7	1–5	2.01	0.58
Insecurity over working conditions	1	1–5	1.23	0.34	1	1–5	2.23	0.45

Conversely, the scales such as social support from colleagues (in Georgia [ $3.95 \pm 0.75$ ]), sense of community at work ([ $3.77 \pm 0.50$ ] in Georgia, [ $3.89 \pm 0.76$ ] in Estonia), role clarity ([ $4.32 \pm 0.55$ ] in Georgia, [ $4.22 \pm 0.67$ ] in Estonia), self-efficacy ([ $3.89 \pm 0.56$ ] in Georgia, [ $3.77 \pm 0.65$ ] in Estonia), meaning of work ([ $4.09 \pm 0.66$ ] in Georgia, [ $4.23 \pm 0.65$ ] in Estonia) and possibilities for development ([ $3.94 \pm 0.77$ ] in Estonia) presented very good results (Table 7).

**Table 7.** COPSOQ Subscale Distribution in Georgia and Estonia (the critical value is the lowest)

Scales	COPSOQ (Georgia)				COPSOQ (Estonia)			
	Number of items	min-max	mean	sd	Number of items	min-max	mean	sd
Influence at work	1	1–5	2.66	0.65	1	1–5	2.70	0.89
Predictability	2	1–5	3.22	0.75	2	1–5	3.29	0.90
Role clarity	1	1–5	4.32	0.55	1	1–5	4.22	0.67
Recognition	1	1–5	3.55	0.76	1	1–5	3.55	0.78
Social support from colleagues	1	1–5	3.95	0.75	1	1–5	3.44	0.66
Social support from supervisor	1	1–5	2.89	0.75	1	1–5	3.23	0.89
Sense of community at work	1	1–5	3.77	0.50	1	1–5	3.89	0.76
Quality of leadership	2	1–5	3.55	0.78	2	1–5	3.65	0.92
Vertical trust	2	1–5	3.23	0.55	2	1–5	3.70	0.67
Organisational justice	2	1–5	3.32	0.72	2	1–5	3.23	0.71
Self-efficacy	6	1–4	3.77	0.56	6	1–4	3.89	0.65
Meaning of work	1	1–5	4.09	0.66	1	1–5	4.23	0.65
Job satisfaction	1	1–5	3.30	0.69	1	1–5	3.45	0.71
Possibilities for development	2	1–5	3.65	0.75	2	1–5	3.94	0.77

With respect to the psychosocial risk factors by a professional group, we can say that nurses are more likely to report negative acts (offensive behaviours) (including sexual harassment, threats of violence, and physical violence) and these acts were mainly coming from patients.

Sleep troubles, burnout, depressive symptoms, insecurity over working conditions were possibly more associated with ageing (+55) healthcare workers than younger ones.

## 2.2. Work Ability and Psychosocial Factors

Quantitative demands ( $r = -0.30$ ;  $p < 0.001$ ), work pace ( $r = -0.36$ ;  $p < 0.001$ ), job insecurity ( $r = -0.32$ ;  $p < 0.001$ ), sleep troubles ( $r = -0.32$ ;  $p < 0.001$ ), burnout ( $r = -0.29$ ;  $p < 0.001$ ), stress ( $r = -0.35$ ;  $p < 0.001$ ), depressive symptoms ( $r = -0.30$ ;  $p < 0.001$ ) and offensive behaviours ( $r = -0.19$ ;  $p < 0.001$ ) showed negative correlation with WAI indicating that the work ability was better, when these risk factors were lower.

Role clarity ( $r = 0.20$ ;  $p < 0.001$ ), recognition ( $r = 0.22$ ;  $p < 0.001$ ), sense of community at work ( $r = 0.24$ ;  $p < 0.001$ ), quality of leadership ( $r = 0.25$ ;  $p < 0.001$ ), organisational justice ( $r = 0.25$ ;  $p < 0.001$ ), self-efficacy ( $r = 0.25$ ;  $p < 0.001$ ), meaning of work ( $r = 0.34$ ;  $p < 0.001$ ), job satisfaction ( $r = 0.185$ ;  $p < 0.001$ ) and possibilities for development ( $r = 0.32$ ;  $p < 0.001$ ) showed positive correlation with WAI indicating that they acted as work ability preservative aspects. We compared the data between younger and ageing HCWs and the same risk factors showed positive and negative correlations with WAI in both cohorts.

## 3. DISCUSSION

The same results of WAI in HCWs are presented in the research by Cotrim et al. (2014), Andrade et al. (2022); Garzaro et al. (2022). In this research, WAI is not in correlation with age ( $r = -0.02$ ;  $p = 0.312$ ). This can be because of a high percentage of sufficient WAI in our sample, a low decline of WAI with age, but a higher mean WAI among participants under 24 years old in Georgia [ $45 \pm 2.83$ ], and among 55 + in Estonia [ $40.11 \pm 4.91$ ] showing a possible healthy worker effect. There are studies that also do not present any interconnection between age and WAI (Cotrim et al., 2014; La Torre et al., 2021); however, some works show a decreased WAI with age (Cotrim et al., 2011, Mateo-Rodríguez et al., 2021b). As presented in the study by La Torre et al. (2021), the WAI is the “thermometer” to evaluate the phenomenon of aging and predict the incidence of incapability to work. Improvements in the working environment and ergonomic equipment are factors positively affecting WAI (Varianou-Mikellidou et al., 2020). Bad ergonomic conditions especially affect ageing workers. Maintaining and improving work ability becomes increasingly important to retain HCWs. It is essential to develop psychological interventions that can protect the mental health of vulnerable groups like ageing HCWs. Several studies identify the importance of improving the work organisation, culture, and environment (Gavin et al., 2020; Gray et al., 2019; Sepp & Jarvis, 2019). Organisations should assist all managers to advance their experience to help their company identify psychological distress and promote mental health and well-being (Baldwin & George, 2021).

The results regarding gender differences vary, some research with HCWs show that men have better WAI scores than women (Cotrim et al., 2011, Cotrim et al., 2014; Mateo-Rodríguez et al., 2021a), but a systematic literature review by Van den Berg et al. (2008) does not show any association between gender and WAI as defined by current study, too.



In this study, the critical values were shown in the scales of “work pace” and “emotional demands”. It was an expected result, as the data were collected during the pandemic and other studies also presented the same results regarding working demands. For example, in the study by Hering et al. (2022) conducted in Germany, 94.2 % out of 811 nurses reported that working demands since the start of the pandemic rose and 59.1 % reported high levels of stress, anxiety, and/or depression. Results of the rapid systematic review and meta-analyses by Mahmud et al. (2021) also revealed that the above-mentioned risk factors were significantly increased during the pandemic.

This research showed that nurses were more likely to report negative acts including sexual harassment, threats of violence, and physical violence and these acts were mainly coming from patients. Workplace Violence (WPV) is the main hazard for HCWs around the world. Most studies show that nurses encounter an excessive amount of violence because they are in close connection with patients (Zhang et al., 2018; Varghese et al., 2022).

Similar risk factors were associated with ageing HCWs in the study by Charles & Wen (2021); this study examined ageing frontline workers and their perceptions of working during the pandemic. Participants reported that they experienced uncertainty, anxiety, fear, stress, and sadness. They felt fear that their family members were at an increased risk of contracting the disease.

It has to be mentioned that the empirical findings of this study are important to promote healthy workspaces and acknowledge challenges in the working environments to increase well-being and productivity throughout the working lives; this is related to the economic outcomes of the companies and, therefore, has a strong connection to the overall economic situation in the countries. Cost-of-illness research illustrated that mental illnesses were linked to a huge economic burden, in the order of tens of billions of dollars each year in the US only (Wang et al., 2003; Hassard et al., 2014). The largest percentage of this economic burden derives from lost work productivity due to mental health problems (Wang et al., 2003).

There were some limitations to this study. The low number of participants did not allow for the generalization of the results to all HCWs. Further research is needed to study the association of these constructs (psychosocial factors and work ability) in healthcare settings among health professionals. There was also a low response rate from male HCWs. In the future, it would be appropriate to study retired HCWs because of the healthy workers’ effect that creates a special type of selection bias.

## CONCLUSION

In summary, the COPSOQ showed critical values in the scales of “work pace” and “emotional demands”. As the data were collected during the pandemic period, the following results were expected. “Sleep troubles”, “burnout”, “depressive symptoms”, and “insecurity over working conditions” were the risk factors more likely associated with ageing (+55) health workers than younger ones. The scales “quantitative demands”, “work pace”, “job insecurity”, “burnout”, “stress”, “sleep troubles”, “offensive behaviours” and “depressive symptoms” were in negative

correlation with WAI. It shows that the work ability is higher when these factors are lower. The scales “role clarity”, “recognition”, “sense of community at work”, “quality of leadership”, “organisational justice”, “self-efficacy”, “meaning of work”, “job satisfaction” and “possibilities for development” were the risk factors in positive correlation with WAI, thus acting as work ability preservative aspects.

This study proposes that intervention measures should primarily indicate ageing HCWs as they experience more likely psychosocial risk factors such as sleep troubles, burnout, depressive symptoms, and insecurity over working conditions. It shows that the work demands of HCWs should be stabilized by their work ability to keep well-being and sustainability all over their working life. Bad mental health is unfavourable to work ability. Lower work ability is possibly linked to stress and burnout.

The research of this cohort is essential to present the influence of the COVID-19 pandemic on health, psychosocial aspects, and work ability. The authors believe that this study will make contribution to the scientific community regarding knowledge of health problems caused during the COVID-19 pandemic and beyond. The study is expected to contribute to the analysis of the conditions of HCWs (especially ageing HCWs) and how they have to be supported to maintain and/or enhance their physical and mental health, well-being, and work ability all over their working life, especially under current crisis time (e.g., Covid-19). While conducting research in those two countries, we can assume that the results can be transferred to other countries with similar backgrounds such as the Baltic States and other Eastern European countries with similar backgrounds.

Using WAI is a good commence to concentrate on the vulnerabilities, yet administering an age-sensitive risk assessment to protect employees will increase safety standards and minimise the risk of occupational accidents and diseases (Varianou-Mikellidou et al., 2019). In addition, age management could be used as a life-course-oriented perspective with a clear focus on the requirements of an ageing workforce.

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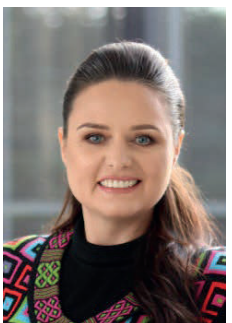
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