Association of poor perceived work ability and psychosocial work-related factors in health and social service worker age groups: a cross-sectional study

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ABSTRACT
Objective Previous work ability studies have primarily focused on old workers and physical health. This study investigated how poor perceived work ability (PPWA) is associated with work-related factors in different health and social service (HSS) worker age groups.

Setting HSS employees (general HSS and eldercare) in nine Finnish public sector organisations.

Participants All employees who were employed in the organisation completed self-reported questionnaires. Of the original sample (N=24 459, response rate 67%), 22 528 gave consent for research use.

Primary and secondary outcome measures Participants evaluated their psychosocial working environment and work ability. Lowest decile of work ability was categorised as poor. The association between psychosocial work-related factors and PPWA in different age-groups of HSS workers, adjusting for perceived health, was analysed with logistic regression.

Results The proportion of PPWA was highest in shift workers, eldercare employees, practical nurses and registered nurses. Considerable variation between age groups exists in the work-related psychosocial factors associated with PPWA. Among young employees engaging leadership and working time and work task autonomy were statistically significant, whereas in middle-aged and old employees procedural justice and ethical strain were highlighted. The strength of the association with perceived health also differs in age groups (young: OR=3.77, 95% CI 3.30 to 4.30; middle-aged: OR=4.66, 95% CI 4.22 to 5.14; old: OR=6.16, 95% CI 5.20 to 7.18).

Conclusions Young employees would benefit from engaging leadership and mentoring, and from more working time and work task autonomy. As employees get older they would benefit more from job modification and from ethical and just organisation culture.

INTRODUCTION
The ageing of the population in Finland increases the use of health and social services (HSS) in the future. Concurrently, an increasing number of HSS workers are retiring and the age groups entering working life are decreasing in size. In the eldercare work stress and sickness absence are at high level.1 2 The length of the employees’ working careers is therefore a major challenge for the HSS sector.

Most previous research on career length has focused on older people’s work ability, showing that work ability decreases with ageing as the physical and mental functionality declines.3 4 Likewise, extending careers has mainly focused on maintaining work ability among older workers to prevent early retirement. However, poor work ability in midlife predicts disability, sickness absences and early retirement in later years.5  7 Thus, extending working careers should be emphasised at the beginning of the work life. Yet, younger workers have received less attention in work ability research than old workers.8 9

Perceived work ability (PWA) is affected by poor health and unhealthy lifestyles, for example, physical inactivity and being overweight.6 10 13 It is affected, however, also by personal competence, values, attitudes and motivation, and the work environment.9 14

Less is known about the predictors of work ability among young employees.
When studying PWA, job demands-resources model (JD-R),\textsuperscript{14, 15} is a useful theoretical framework.\textsuperscript{16} JD-R model assumes that imbalance between job demands and resources causes strain in employees.\textsuperscript{14, 15} Examples of job demands include high work pressure and emotional demands; job control, fairness and opportunities for developments are examples of job resources.\textsuperscript{16} Less is known of the association between PWA and ethical strain. Ethical strain is a significant source of strain among HSS workers.\textsuperscript{17–19} According to Huffman and Rittenmeyer,\textsuperscript{20} ethical strain is experienced especially when nurses feel the need to advocate for patients’ well-being, while coping with institutional constraints. Ethical strain is associated with increased burnout, turnover intentions and decreased job satisfaction.\textsuperscript{21} and thus might be detrimental to work ability. Regarding job resources, engaging leadership is also seldom studied. It assumes that engaging and inspiring leaders would reduce burnout and increase work engagement and commitment of their employees.\textsuperscript{21} To our knowledge, no previous studies have examined the association between work ability and ethical strain or engaging leadership.

To our knowledge, only few studies have examined poor work ability among HSS workers of different ages.\textsuperscript{22} This knowledge is needed to support the young workers to cope with the demanding job and in enabling them to replace the retiring age groups. Therefore, the aim of this study is to investigate how poor perceived work ability (PPWA) is associated with work-related factors in young, middle-aged and old HSS workers. Finding differences in the factors predicting poor work ability can facilitate developing tailored ways to promote work ability and longer work careers in all HSS worker age groups.

**METHODS**

**Study design**

The study was conducted in nine Finnish public sector organisations in fall 2020. All employees who were employed in the organisation completed self-reported questionnaires. Of the original sample (N=24 459, response rate 67%), 22 528 gave consent for research use. Based on the work unit organisation, employees were classified to general HSS (n=18 155) and eldercare (n=4 347) sectors. Twenty-six participants could not be clearly placed in either category and were excluded from the analyses, resulting in the final sample 22 502.

**Perceived work ability**

Participants’ current PWA compared with their lifetime best was measured with the work ability scale, which is part of the work ability index,\textsuperscript{23} a single item question with a rating scale from 0 (‘completely unable to work’) to 10 (‘work ability at its best’). It has shown to be a valid indicator of sick leaves and early retirement.\textsuperscript{24}

In this article the focus was on PPWA, and we therefore dichotomised the variable. We set the lowest decile (0–5) as having PPWA (mean=7.75, 95% CI 7.73 to 7.77).

**Psychosocial work-related factors: job demands, job resources and leadership**

As job demands we included job strain (quantitative workload) and ethical strain (qualitative workload). Job strain is modified version from the Job Content Questionnaire,\textsuperscript{30} consisting of two questions: ‘I am required to do an unreasonable amount of work’ and ‘I don’t have enough time to get my work done’. The response categories ranged from 1 to 5 (1=strongly agree to 5=strongly disagree). Cronbach’s alpha for the scale was 0.88. Ethical strain follows Nash’s theory,\textsuperscript{27} including two questions: ‘How often do you have to act against rules and norms?’ and ‘How often do you have to act against your own values?’. The response scale was a 5-point scale (1=never to 5=daily). Cronbach’s alpha for the scale was 0.77.

Job resources include working-time autonomy, non-monotonous work and worktask autonomy. They were modified from the Job Content Questionnaire.\textsuperscript{26} Working-time autonomy include seven questions, which inquires respondents’ possibilities to influence on work time (eg, influence on the length of the workday, taking of breaks during the workday). Response options were from 1 to 5 (1=not at all to 5=very much). Non-monotonous work was measured by one question: ‘My job involves a lot of similar repetitive tasks’ (scale inverted) as well as worktask autonomy: ‘I have lot of say in my own work’. Response options ranged from 1 to 5 (1=strongly disagree to 5=strongly agree).

Leadership consists of procedural and relational justice, and engaging leadership. Procedural justice and relational justice were measured following Moorman’s approach to organisational injustice theory.\textsuperscript{26} Procedural justice consist of five statements such as ‘Decisions made are consistent (the rules are the same for everyone)’ and ‘Effects of decisions are monitored and communicated’. Also relational justice includes five statements such as ‘My supervisor’s personal preferences do not interfere with his/her decisions’ and ‘My supervisor treats his/her subordinates kindly and attentively’. Response options for both scales ranged from 1 to 5 (1=not at all to 5=totaly agree). Cronbach’s alpha for procedural justice was 0.92 and for relational justice 0.93. Engaging leadership was measured with items from Schaufeli.\textsuperscript{31} It consists of nine statements such as ‘my supervisor encourages team members to develop their talents as much as possible’ and ‘my supervisor encourages team members to use their own strengths’. Response options ranged from 1 to 5 (1=not at all to 5=totally agree). Cronbach’s alpha for engaging leadership scale was 0.95.

**Covariates**

We used work unit category (general HSS, elderly care), gender (males, females), supervisory position (yes, no), and biggest occupations (practical nurse, doctor, nurse, social or other counsellor, other), shift work (yes, no) and perceived health as covariates in the analysis. Perceived health was dichotomised by categorising responses (good and fairly good) as good health and (average, fairly poor,
Statistics

Despite of conceptual similarity, perceived health does not overlap with work ability (see correlations in online supplemental table 1).

In our dataset the biggest occupation groups were nurses (34%), practical nurses (23%), doctors (8%) and social or other counsellors (7%). In Finland nurses are responsible for carrying out demanding nursing tasks whereas practical nurses assist and give daily care. Doctors are responsible for medical care. Social and other counsellors have a more supportive and advisory role.

Statistical analysis

Associations between psychosocial work-related factors and PPWA were analysed with logistic regression. A two-step regression model was fitted separately for three age groups (young: under 35, middle-aged: 35–55 and old: over 55). Covariates (excluding perceived health), job demands and resources and leadership variables were included in the first step. Perceived health was included in the second step to see whether regression coefficients change after including perceived health.

Patient and public involvement

No patient or public involvement.

RESULTS

Demographic characteristics of the data are presented in table 1. In all age groups, the proportion of PPWA was higher among eldercare workers than among others. In the young and old age groups, female workers were more likely to have PPWA than males. Supervisors were less likely to have PPWA than employees. In the youngest age group difference was statistically insignificant due to small number of supervisors. Practical nurses, nurses, and social and other counsellors reported more often PPWA than doctors or workers in other occupations. Moreover, employees doing shift work reported more often PPWA than employees in regular work.

Multivariable analysis

We conducted a logistic regression analysis separately for three age groups to obtain ORs for the associations between PPWA and organisation sector, job demands, job resources, leadership and perceived health (see table 2). Model was adjusted for gender, supervisory position, occupation and shift work. Differences in PPWA between eldercare and general HSS disappear after adding other variables in the model. In step 1, job strain and ethical strain were associated with PPWA in all age groups. After adjusting with perceived health, association between job strain and PPWA remained statistically significant in all age groups; however, in young employees, the association between ethical strain and PPWA became statistically insignificant.

Associations between PPWA and job resources were slightly weaker than between PPWA and job demands. They also varied in age groups. Among young employees, after adjusting for perceived health, PPWA remained associated with working time autonomy and work task autonomy and unassociated with non-monotonous work. In the middle-aged and oldest employees, in step 1, PPWA was associated with all job resources. However, after adjusting with perceived health, only work task autonomy remained statistically significant for middle-aged employees and non-monotonous work for the oldest age group.

We included procedural justice and engaging leadership in the model and excluded relational justice due to high correlation (r=0.76) with engaging leadership. In step 1, PPWA was associated with procedural justice and engaging leadership in young and middle-aged employees. After adjusting with perceived health, both leadership variables were statistically significant only for middle-aged employees. In young employees PPWA was only associated with engaging leadership and in the oldest group with only procedural justice.

PPWA was associated with perceived health in all age groups. However, in older age groups the association was stronger: in young employees the OR for perceived health was 3.77 (95% CI 3.30 to 4.30), in middle-aged employees 4.66 (95% CI 4.22 to 5.14) and in old employees 6.16 (95% CI 5.20 to 7.18).

The explanation power (Nagelkerke R²) of the model increased between first and second step with increasing age. Among young employees the explanation power was 0.15 after the first step and 0.33 after the second. In old employees the corresponding numbers were 0.11 and 0.40.

DISCUSSION

Summary of the findings

This study investigated how PPWA is associated with work-related psychosocial factors in three age groups of HSS workers. Overall, the proportion of PPWA was highest in shift workers, eldercare employees, practical nurses and nurses. We observed differences in young and older employees regarding, first, the association between PPWA and leadership. Unlike among old employees, when adjusting for perceived health, PPWA was in young and middle-aged employees associated with engaging leadership. Conversely, unlike among young employees, in middle-aged and old employees PPWA was associated with procedural justice. Second, in young employees, when adjusted for perceived health, PPWA was associated with working time autonomy and work task autonomy; in middle-aged employees only work task autonomy was statistically significant and in the oldest age group only non-monotonous work. Job strain was associated with PPWA in all age groups and ethical strain among middle-aged and old employees. Poor perceived health was most strongly associated to work ability and its significance was emphasised in older employees.

Comparison with previous studies

To our knowledge, studies investigating poor work ability among HSS workers of different ages are rare. Our findings
Table 1  Demographic characteristics and the proportions having poor perceived work ability (PPWA) in three age groups

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Young (less than 35)</th>
<th>Middle-aged (35–54)</th>
<th>Old (55+)</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n with PPWA/total N</td>
<td>% with PPWA</td>
<td>n with PPWA/total N</td>
<td>% with PPWA</td>
</tr>
<tr>
<td>Sector</td>
<td>General HSS</td>
<td>401/4203 9.5</td>
<td>860/9568 9.0</td>
<td>432/4340 10.0</td>
</tr>
<tr>
<td></td>
<td>Eldercare</td>
<td>128/920 13.9</td>
<td>224/2131 10.5</td>
<td>180/1279 14.1</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>464/4294 10.8</td>
<td>955/10154 9.4</td>
<td>565/5049 11.2</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>65/829 7.8</td>
<td>129/1545 8.3</td>
<td>47/570 8.2</td>
</tr>
<tr>
<td>Supervisory position</td>
<td>Yes</td>
<td>4/79 5.1</td>
<td>57/1042 5.5</td>
<td>25/645 3.9</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>523/5034 10.4</td>
<td>1020/10627 9.6</td>
<td>582/4941 11.8</td>
</tr>
<tr>
<td>Occupation</td>
<td>Practical nurse</td>
<td>138/1143 12.1</td>
<td>255/2314 11.0</td>
<td>188/1341 14.0</td>
</tr>
<tr>
<td></td>
<td>Doctor</td>
<td>35/416 8.4</td>
<td>57/782 7.3</td>
<td>22/396 5.6</td>
</tr>
<tr>
<td></td>
<td>Nurse</td>
<td>250/2027 12.3</td>
<td>393/3782 10.4</td>
<td>155/1249 12.4</td>
</tr>
<tr>
<td></td>
<td>Social and other counsellors</td>
<td>20/264 7.6</td>
<td>90/900 10.0</td>
<td>34/335 10.1</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>66/1023 6.5</td>
<td>238/3031 7.9</td>
<td>167/1789 9.3</td>
</tr>
<tr>
<td>Shift work</td>
<td>Yes</td>
<td>364/3118 11.7</td>
<td>564/5367 10.5</td>
<td>298/2299 13.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>165/1999 8.3</td>
<td>520/6311 8.2</td>
<td>311/3302 9.4</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>529/5123 10.3</td>
<td>1084/11699 9.3</td>
<td>612/5619 10.9</td>
</tr>
</tbody>
</table>

Based on χ²-test differences are statistically significant in all age groups, except gender in age group 35–54 and supervisory position of respondents under 35 years old. HSS, health and social service.
Table 2  ORs with 95% CIs from a two-step logistic regression analysis of poor perceived work ability (PPWA) and work-related psychosocial factors, separately for three age groups

<table>
<thead>
<tr>
<th></th>
<th>Young (less than 35)</th>
<th>Middle-aged (35–54)</th>
<th>Old (55+)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
<td>Step 2</td>
<td>Step 1</td>
</tr>
<tr>
<td>General HSS (ref.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eldercare</td>
<td>1.41 (1.04 to 1.91)*</td>
<td>1.38 (0.97 to 1.95)</td>
<td>0.99 (0.80 to 1.22)</td>
</tr>
<tr>
<td>Job demands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job strain</td>
<td>1.50 (1.35 to 1.66)***</td>
<td>1.36 (1.21 to 1.52)***</td>
<td>1.48 (1.38 to 1.59)***</td>
</tr>
<tr>
<td>Ethical strain</td>
<td>1.20 (1.08 to 1.33)**</td>
<td>1.09 (0.97 to 1.22)</td>
<td>1.19 (1.11 to 1.28)***</td>
</tr>
<tr>
<td>Job resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working time autonomy</td>
<td>0.76 (0.64 to 0.90)**</td>
<td>0.72 (0.59 to 0.87)**</td>
<td>0.89 (0.80 to 1.00)*</td>
</tr>
<tr>
<td>Non-monotonous work</td>
<td>0.91 (0.82 to 1.01)</td>
<td>0.91 (0.81 to 1.01)</td>
<td>0.94 (0.88 to 1.00)*</td>
</tr>
<tr>
<td>Work task autonomy</td>
<td>0.84 (0.75 to 0.93)**</td>
<td>0.86 (0.76 to 0.97)</td>
<td>0.81 (0.75 to 0.88)***</td>
</tr>
<tr>
<td>Leadership style</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procedural justice</td>
<td>0.86 (0.76 to 0.98)*</td>
<td>0.87 (0.76 to 1.00)</td>
<td>0.79 (0.72 to 0.86)***</td>
</tr>
<tr>
<td>Engaging leadership</td>
<td>0.79 (0.70 to 0.90)***</td>
<td>0.82 (0.71 to 0.95)**</td>
<td>0.82 (0.75 to 0.89)***</td>
</tr>
<tr>
<td>Perceived health (ref.=good)</td>
<td>3.77 (3.30 to 4.30)***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model summary

|                          |                      |                      |           |                      |           |                      |
|--------------------------|----------------------|----------------------|           |                      |           |                      |
| Nagelkerke R²            | 0.15                 | 0.33                 | 0.13      | 0.36                 | 0.11      | 0.40                 |
| χ² (df)                  | 364.16 (15)***       | 833.62 (16)***       | 663.00 (15)***| 1924.37 (16)***       | 274.42 (15)***| 1124.19 (16)***       |
| N                        | 4812                 | 4812                 | 10609     | 10609                | 4975      | 4975                 |

First step includes work-related psychosocial factors. The second one adds perceived health. Models are adjusted for gender, supervisory position, occupation and shift work.

***p<0.001, **p<0.01, *p<0.05.

HSS, health and social service.
of age-related differences in work-related psychosocial factors and PPWA are thus mostly incomparable with previous studies. Yet, many findings of this study are generally in line with those of previous work ability studies. First, regarding the strong association between poor health and poor work ability in this study, in earlier studies physically strenuous job and unhealthy lifestyle are found to decrease work ability, with old employees being in highest risk. Second, our finding of an association between job strain and PPWA is in line with previous studies, which also found straining work to be harmful to work ability. The fact that ethical strain was associated with PPWA in middle-aged and old employees, is, to our knowledge, a novel finding. Third, our results supported the assumptions of the JD-R model. We found out that PPWA had a weaker association with job resources than with job demands. Fourth, our finding that leadership has different associations with PPWA in different age groups, is contradictory to that of Pohjonen, who found that factors associated with work ability are similar in all ages.

Strengths and limitations
The strengths of the present study include the information of HSS employees’ work ability in different ages. The study population was large and it covered extensively Finnish social and healthcare employees, as the response rate was reasonable (67%). The population is also categorised in general HSS and eldercare, the latter being a rare target group in work ability studies. Cross-sectional study design is a clear limitation. It prevents us making conclusions about the causal effect of psychosocial work-related factors on work ability. Future studies with longitudinal design are needed to confirm the causality of the associations found in this study. Second limitation is the lack of lifestyle-related control variables in our data. Respondent’s body mass index, smoking status, at-risk alcohol use and physical activity are potential confounders for the associations between psychosocial work-related factors and work ability. We substituted lifestyle variables with the question of perceived health, however, and it can be considered to be an estimate of health behaviours. Finally, although we controlled several factors in our analysis, other potential determinants of PPWA may exist. Thus, future studies should examine other potential determinants and the mediators of PWA.

Interpretation of the results
The results of this study indicate a need for age-related approach to supporting employees’ work ability. Among the young employees, PPWA was associated with job strain, working time and work task autonomy, and engaging leadership. Psychosocial work-related factors also explained a bigger proportion of the model variance after step 1 (Nagelkerke R²=0.15) compared with old employees (0.11). Our results suggest, first, that psychosocial work-related factors are more important for the PWA of young employees than of older employees. Second, with less working life experience, they might benefit from mentoring of how to recover from strenuous work, and how to maintain healthy lifestyles. Third, the highlight on working time and work task autonomy indicates that young employees would also benefit from solutions to balance between work and family. Fourth, as engaging leadership appears to have a positive association with young employees’ work ability, it is a leadership style worth considering in HSS organisations. Rather surprisingly, in young employees, ethical strain remained statistically insignificant for PPWA after adjusting for perceived health. As young employees have been suggested to suffer more from ethical strain due to inadequate stress coping skills, our finding needs confirmation from future studies.

In the middle-aged and old group PPWA was associated with ethical strain and procedural justice. As middle-aged and old employees have more experience of HSS organisation management, they may also have more experiences of injustice and more demand for procedural justice. Improving procedural justice is a key target for HSS organisations, one that requires changes in organisational culture. Organisational cultures should also consider ethical issues more comprehensively, as this can reduce employees’ ethical strain.

In old employees, PPWA was associated with nonmonotonous work. Additionally, the older the employee, stronger was the association between PPWA and perceived health. Adding perceived health to the model also improved its explanatory power more among old employees. These findings suggest that old employees could benefit from possibilities to modify the work to support their health and work ability.

Finally, as PPWA was associated with job strain in all age groups, HSS organisations should decrease the workload and improve job control with all possible means. Promoting recovery from work, both during and after the working day, is also recommended. HSS organisations would benefit from identifying employees who are in risk of PPWA. In line with previous studies, this study has identified shift workers being in risk for PPWA. Moreover, eldercare employees, practical nurses and nurses were highlighted.

CONCLUSIONS
This study has shown that among HSS employees, considerable variation between age groups exists in the work-related psychosocial factors associated with PPWA. The strength of the association with perceived health also differs in age groups. Promotion and supporting work ability of young and old employees should therefore also differ and the actions need to be tailored accordingly. Young employees would benefit from engaging leadership and mentoring, and from more working time and work task autonomy. Older employees would benefit more from job modification and from ethical and just organisation culture.

Contributors All authors were involved in designing the study. KS, RN and JL contributed to the data collection. KS performed the data analysis and wrote the first draft of manuscript with RN. KS, RN, EK, TS and JL contributed to the editorial process of the manuscript and approved the final manuscript. KS has responsibility for the overall content of the manuscript as the guarantor.

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Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by an institutional board of the Finnish Institute of Occupational Health (ID PÖYTÄKIRJA ETR 12/2020). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No data are available. The data are not openly available due to the sensitivity of employee data.

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