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Demand-specific work ability among employees with migraine or frequent headache

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ABSTRACT

Headache disorders have serious implications for employees’ work ability (WA). However, there is inadequate knowledge of what specific work-related activities that are affected by headache. We investigated demand-specific WA among individuals with migraine or frequent headache. We used cross-sectional questionnaire-data (n = 5,551) containing information about “migraine or frequent headache” and difficulties handling seven different job demands. In subgroup analyses (n = 4,028), we added information on medication. In ordinal logistic regression, we adjusted for sex, age, education, depressive symptoms and musculoskeletal pain. Individuals with previous or current migraine/HEADache had poorer WA, particularly with respect to the ability of handling physical and cognitive job demands. No use of medication as well as overuse of medication—both signalling suboptimal treatment—might aggravate the difficulties complying with job demands. Additionally, depressive symptoms and musculoskeletal pain seem to play a major role for the level of disability. Employees with headache disorders need adequate diagnosis and treatment. Rehabilitation should also address mental health as well as concurrent (musculoskeletal) pain conditions, which potentially benefit from non-medical interventions. Adjustment of the working conditions (physical and cognitive job demands) is likely to improve the work ability in this group of employees.

1. Introduction

Headache disorders are the most prevalent neurological disorder, and among the primary headaches (headaches without another underlying disease as a cause) migraine and tension-type headache (TTH) are the most frequent (Baigi and Stewart, 2015). The one-year prevalence of migraine is 18% among women and 6% among men (Al-Hassany et al., 2020). The one-year prevalence of TTH is around 80% and more frequent in women than in men (prevalence ratio of 1.2:1.0) [3]. The prevalence of both types of headache disorders peaks in the age of 30–39 years in both sexes (Baigi and Stewart, 2015; Lipton et al., 2001).

Migraine is characterized by attacks of moderate to severe pulsating headaches accompanied by neurological symptoms such as nausea, vomiting, and sensitivity to light and sound (Jawed et al., 2019). Furthermore, pain typically worsens during normal physical activity (Katsarava et al., 2012). During attacks, memory, concentration, energy levels, and mental functioning are negatively affected (Giguere et al., 2015). TTH is characterized by mild to moderate bilateral pain. Nausea and vomiting is usually absent, and the symptoms do not worsen during physical activity (Headache Classification Committee of the International Headache Society (IHS), 2018). In its frequent form, TTH is present 1–14 days/month and in its chronic form in at least 15 days/month (Ashina et al., 2021).

Migraine and TTH co-occur with emotional problems and poor mental and physical health (Raggi et al., 2012; Stovner et al., 2018), and these disorders have substantial consequences in terms of disability. Indeed, migraine ranks second in terms of years lived with disability, only preceded by low back pain (Findings from the Global Burden of Disease Study, 2017). Another adverse consequence is medication-overuse headache (MOH), a distinct form of headache...
occurring on ≥15 days/month caused by the medication (taken ≥10 or ≥15 days days/month, depending on the medication, for more than three months). MOH is characterized by a cycle of chronic headache, intensified pain medication use, refractoriness to treatment, and increasing disability (Diener and Limmroth, 2004).

Not surprisingly, headache disorders have serious implications for employees’ work ability (Stovner et al., 2018; D’Amico et al., 2015; Hedenrud et al., 2014; Kessler et al., 2010) and are associated with sickness absence (Fiane et al., 2006; Rasmussen et al., 1992), reduced effectiveness (Jensen and Rasmussen, 2004; Schwartz et al., 1997) and productivity (Berardelli et al., 2019). Yet, previous research on headache disorders and work ability has mainly used generic measures of work ability (Hedenrud et al., 2014; Kessler et al., 2010; van der Doef and Schelvis, 2019), disability in general (Hedenrud et al., 2014; D’Amico et al., 2011), or sickness absence (Kessler et al., 2010). Thus, there is inadequate knowledge of what specific work-related activities that are mostly affected by headache disorders (Raggi et al., 2014). This lack of knowledge hampers the possibility of adapting work-related demands to the employees’ specific functional impairments and thereby improving work ability.

We hypothesized that some aspects of the participants’ work ability would be more affected than other aspects due to the characteristics of their headache disorder. Against this background, the main aim of the study was to investigate the demand-specific work ability among people with headache disorders, which in our study were operationalized as self-reported “migraine or frequent headache”. In additional analyses, we investigated demand-specific work ability among participants with possible MOH.

**Fig. 1.** Flowchart of the selection of study participants. The flowchart explains the number of participants invited to the CAMB study, non-respondents at each step, and number of participants not eligible for inclusion or excluded due to missing data.
2. Methods

2.1. Study design and study population

We used cross-sectional questionnaire data obtained from the Copenhagen Aging and Midlife Biobank (CABM) (Avlund et al., 2014). Data were collected from 2009 to 2011. Participants were recruited from earlier cohort studies including the Metropolit Project, the Copenhagen Perinatal Cohort, and the Danish Longitudinal Study on Work, Unemployment and Health. A total of 17,937 individuals aged 49–61 years were invited to participate in the data collection, whereas 7,189 participants (40%) completed the survey (4,956 men and 2,233 women) (Avlund et al., 2014).

2.2. Inclusion and exclusion criteria

To be eligible for inclusion in the main analyses of the present study, participants had to be occupationally active and indicate a main occupation other than “other” (n = 6,182). We excluded participants with missing data on main exposures, outcomes or covariates from the analyses (n = 631). Thus, the final sample eligible for the main analyses comprised 5,551 participants (Fig. 1). Among excluded participants, 14.4% had current migraine/frequent headache and 13.9% had previous migraine/frequent headache.

As part of the CABM study, participants who completed the questionnaire were invited to a study clinic for further examination. This examination included an interview and, for example, blood tests, and test of physical and cognitive functioning. Among those eligible for inclusion in our main analyses, 4,505 also had available data from this examination, which took place at The National Research Centre for the Working Environment, Copenhagen, Denmark. During the visit, information about use of medication was obtained through interviews. From this group of participants, we included 4,028 participants with current or no migraine/frequent headache in the subgroup-analyses of MOH.

2.3. Migraine and frequent headache

Information about migraine and frequent headache was obtained through questionnaires. Participants responded to the question: “Do you have or have you had any of the following diseases: Migraine or frequent headache?” with the response options: 1) “Yes, I have now”, 2) “Yes, I have had”, and 3) “No, I have never had” (will be referred to as “Currently”, “Previously” and “Never”). The available data did not allow us to differentiate between migraine and, for instance, TTH, and we refer to the variable as “migraine/frequent headache”.

2.4. Migraine and frequent headache and use of medication

A subsample of the CABM participants, who showed up for an examination, was interviewed about medication use during the last three weeks (participants were asked to bring their medication to the examination). Information about medication was registered by the interviewer and categorized according to their Anatomic Therapeutic Chemical (ATC) codes. For the purpose of the present study, we used these codes to extract information about over-the-counter analgesics, as well as prescription medication used for attacks and prophylaxis of migraine. We applied information about anti-inflammatory and anti-rheumatic drugs (M01A excl. M01AX5), opioids (N02A incl. R05DA04), other analgesics and antipyretics (N02B), ergotamine (N02CA), and triptans (N02CC). The selection of these specific drugs was based on a previous study on MOH (Salhofer-Polanyi et al., 2020). For each type of medication that the participants mentioned in the interview, they were further asked about the frequency of their intake with the response options “several times a day”, “daily”, “1–6 times a week”, “less frequently, as needed”.

In the current study, we combined information about migraine/
(OR) with their 95% Confidence Intervals (CI), and they should be interpreted as the odds of having more difficulties (i.e. poorer work ability) compared with participants without migraine/frequent headache (Table 2). In model 1 we adjusted for sex and age. In model 2, we further adjusted for vocational education as an indicator of socioeconomic position. In model 3, we further adjusted for depressive symptoms and musculoskeletal pain. To ease the interpretation of the findings, we dichotomized the work ability variables into “low disability” (response options: never/seldom) and “high disability” (response options: sometimes/often/always difficulties) and presented the distribution of poor work ability in all exposure groups (Fig. 2).

Third, the association between the variable combining migraine/frequent headache with the use of medication and demand-specific work ability was analysed in three different models following the same structure as in the main analyses.

The assumption of proportional odds was tested in univariate analyses including migraine/frequent headache and each of the work ability-variables. The assumption of proportional odds was violated for the dichotomized measure of difficulties cooperating with colleagues (univariate analysis, main sample: p = 0.02, sub-analyses: p = 0.055). We therefore ran model 1, 2 and 3 with this dichotomous outcome to test the robustness of our findings.

Fourth, in sensitivity analyses, we modified model 3 and adjusted for depressive symptoms and musculoskeletal pain in separate analyses in order to test the robustness of our findings (response options: some––––––60% and never––––––10%). The estimates were found for the ability to handle physical demands (OR = 1.71), to handle psychological demands such as remembering things (OR = 1.98; 95% CI: 1.58–2.47) and cognitive demands such as remembering things (OR = 1.66; 95% CI: 1.40–1.98) and making quick decisions (1.43; 95% CI: 1.19–1.71). The estimates for the dichotomized measure of difficulties cooperating with colleagues had the same direction as in the main analyses (see footnote in Table 3). We did not find any indications of an interaction between level of vocational education and migraine/frequent headache (data not shown).

3. Results

In this sample of 5,551 occupationally active men and women aged 49–62 years, 10.7% previously had migraine/frequent headache, and 9.2% currently had migraine/frequent headache. Participants with migraine/frequent headache were more frequently female, were slightly younger, and had a shorter vocational education, and they more frequently reported depressive symptoms and musculoskeletal pain. The percentage of full-time employees did not differ between groups. Yet, part-time employment or holding a “flex job” were more frequent among participants with migraine/frequent headache. Use of medication within the last three weeks or daily was most frequent among participants with current migraine/frequent headache (Table 1).

The highest prevalence of poor work ability was found in relation to physical demands, workload and pace of work (Fig. 2). With adjustment for sex, age and vocational education (Table 2, model 2), we found that participants with previous or current migraine/frequent headache had higher odds of poorer work ability across all outcomes. The highest estimates were found for the ability to handle physical demands (OR = 1.98; 95% CI: 1.58–2.47) and cognitive demands such as remembering things (OR = 1.66; 95% CI: 1.40–1.98) and making quick decisions (1.43; 95% CI: 1.19–1.71). The estimates for the dichotomized measure of difficulties cooperating with colleagues had the same direction as in the main analyses (see footnote in Table 3). We did not find any indications of an interaction between level of vocational education and migraine/frequent headache (data not shown).

Adjusting for depressive symptoms and musculoskeletal pain, substantially reduced the observed associations. Thus, in model 3, only the associations between current migraine/frequent headache and the ability to handle physical demands and remembering things were close to being statistically significant. In sensitivity analyses, we adjusted separately for depressive symptoms and musculoskeletal pain in these analyses, the addition of both depression and musculoskeletal pain diminished the association further.
In the subgroup analyses, we found the poorest work ability among participants with migraine/frequent headache and no or daily use of medication (Table 3, model 1 and 2). The strongest associations were found in relation to difficulties handling the physical demands and cognitive demands related to memory and decision-making, and additionally to the pace of work and to client-work among those not using medication. When adjusting for depressive symptoms and musculoskeletal pain all estimates substantially attenuated, and among participants with current migraine/frequent headache and daily use of medication, only the odds of difficulties handling physical demands were significantly higher than among participants without migraine/frequent headache (OR = 3.70, 95% CI: 2.61–5.23).

4. Discussion

4.1. Main findings

Across all the investigated measures of demand-specific work ability, participants with migraine/frequent headache had poorer work ability compared with employees without migraine/frequent headache. Particularly, the ability to handle physical demands, remembering things of importance for the job tasks, and making quick decisions were substantially poorer. All the associations were only slightly confounded by differences in sex, age and vocational education between participants with no, previous or current migraine/frequent headache. Yet, adjustment for depressive symptoms and musculoskeletal pain attenuated most of the associations observed. In the subgroup analyses, the poorest work ability was found among participants with current migraine/frequent headache either with no or daily use of medication. Also in these analyses, difficulties handling physical demands were most pronounced.

4.2. Comparison with previous research

In this study, we found that employees with a headache disorder had poorer work ability than participants without a headache disorder. This overall finding is in accordance with results from previous studies, which have used sickness absence, productivity, and effectiveness as indicators of work ability (D’Amico et al., 2015; Kessler et al., 2010; Fiane et al., 2006; Rasmussen et al., 1992; Schwartz et al., 1997; Berardelli et al., 2019). Other studies have found that headache disorders were associated with lower work performance and had negative consequences for workplace activities (D’Amico et al., 2015; Kessler et al., 2010). Furthermore, a previous study found that people with frequent headache had poorer mental and physical work ability than those with infrequent headache (Hedenrud et al., 2014). In the current study, we applied a more detailed assessment of which job demands the participants had difficulties meeting. Our findings confirmed the previously observed association with poorer physical work ability (Hedenrud et al., 2014). This finding could be explained by the worsening of migraine during normal physical activity (Katsarava et al., 2012). Likewise, difficulties meeting cognitive demands could be explained by the negative effect of migraine on memory, concentration, energy levels, and mental functioning (Gil-Gouveia et al., 2015). TTH is characterized by mild to moderate pain and is not usually accompanied by the same symptoms as migraine. Yet, it seems plausible that frequent, moderate pain affects overall performance although milder episodes may not yield a measurable effect.

In our study, the association between headache disorders and poor work ability was substantially attenuated when adjusting for depressive symptoms and musculoskeletal pain. This finding comply with results from a previous study (Kessler et al., 2010). Both depression and musculoskeletal pain are ranked high in terms of years lived with disability (Findings from the Global Burden of Disease Study, 2017), and both are associated with poorer work ability (Skovlund et al., 2020;
Fig. 2. Distribution of poor workability (i.e., having sometimes, often or always difficulties complying with the demands of the job). Percentages are presented for the main study population (Never, previously, currently, n = 5,551) and for the subsample (Never, currently + no/sometimes/daily use of medication, n = 4,028).

Theis et al., 2018). In a previous study, comprising 4,893 participants (who were also invited to the CAMB study 3–5 years later), the association between musculoskeletal pain/depressive symptoms and demand-specific work ability was investigated. In a mutually adjusted model, it was found that musculoskeletal pain was solely associated with difficulties managing the physical job demands, the amount and pace of work, and memory demands, while depressive symptoms were associated with all measures of demand-specific work ability apart from demands related to client work (Nabe-Nielsen et al., 2014). Thus, both individually and as a multi-morbid condition, musculoskeletal pain, depressive symptoms and headache disorders compromise work ability.

Interestingly, a recent review suggests changes in mood and cognition, fatigue and neck discomfort as symptoms occurring as warning signals of an upcoming migraine attack (Karsan and Goadsby, 2021). Therefore, in our study, depressive symptoms and musculoskeletal pain could act as mediators of the observed migraine/headache-work ability association. These insights open new avenues for treatment and improvement of quality of life and work ability among employees with headache disorders. For example, another recent review suggests that the treatment of one pain condition can ameliorate other pain conditions in the same patient (Affaitati et al., 2020). Furthermore, physical activity has been suggested as a generic intervention with potential positive effects on both mood (Bull et al., 2020) and musculoskeletal pain (Booth et al., 2017). Additionally, the Danish National Clinical Guidelines for non-medical treatment of headache disorders recommend supervised physical activity, consultations with a psychologist, and patient education in headache; still, the evidence for treatment effects is weak and based on relatively few randomized controlled trials (Nationalt Videnscenter for Hovedpine, 2021).

In our subgroup analyses, the poorest work ability (particularly physical and cognitive or related to workload or pace of work) was found among participants with current migraine/frequent headache and either no or daily use of medication. We assume that the mechanisms explaining the poorer work ability in these two groups are not the same: In general, migraine is underdiagnosed and undertreated (Lipton et al., 2013; Viana et al., 2020). Therefore, our findings may reflect inappropriate medical management of the disorder among those who have headache, but do not report the use of any medication to treat their condition. Accordingly, our finding of poorer work ability in the group of participants with migraine/frequent headache and no use of medication, indicate an opportunity for intervention. At the same time, previous research found MOH to be the most prevalent chronic headache disorder (Munksgaard et al., 2019) and often occurring among people in their 30s–50s (Westergaard et al., 2016). The chronicity of MOH could provide an explanation for the poorer work ability among participants with possible MOH, and our results indicate the potential for a substantial impact of medical counselling on work ability in employees with a headache disorder and daily use of medication.

Despite the consistent findings of poorer work ability among employees with a headache disorder, these disorders do not always seem to be associated with higher sickness absence, and some research suggests perceived stigma as the explanation of this (Hedenrud et al., 2014; Parikh and Young, 2019; Young et al., 2013). In terms of employment, we found the same prevalence of full-time employment regardless of migraine/frequent headache-status. Yet, participants with a headache disorder were more frequently holding part-time or flex jobs. Thus, on the one hand, headache disorders do not generally seem to hinder full-time employment. But on the other hand, for a minority, reduced hours seem to be a solution. Furthermore, in our study those most severely affected by a headache disorder may be out of employment, and therefore excluded from the study. In the original sample, 6.4% of those with current migraine/frequent headache were unemployed, while this was the case for 3.4% of those without migraine/frequent headache. Actually, it has been suggested that there are insufficient employment opportunities for people with headache disorders, and we speculate that stigma related to these disorders (Parikh and Young, 2019; Young et al., 2013; Martínez-Fernández et al., 2020) may hinder adequate workplace adaptations or rehabilitation among those who are most seriously affected and thereby also at a higher risk of exclusion from the labour market.

Shift work, long working hours, noise, demanding postures, and psychosocial work-related stressors are associated with a higher risk of TTH and/or migraine (Nagaya et al., 2018; Berry, 2007; Appel et al., 2020; Sandoe et al., 2019; Tynes, 2013; Urhammer et al., 2020). Thus, in the context of headache disorders, work factors play a dual role as a potential trigger of headache attacks and as a contextual factor making it difficult for people with headache to comply with the demands of the job even if the attacks as such are unrelated to exposures at work.
The strengths of the current study lie in its large study population comprising men and women and representing different socioeconomic groups. Our study is also strengthened by the subgroup analyses encompassing detailed information about use of prescribed over-the-counter analgesics allowing us to assess work ability among participants with possible MOH. Furthermore, in contrast to previous research, we assessed work ability related to specific work-related demands, which enabled us to investigate what specific job demands participants with a headache disorder found it particularly challenging to meet.

The main limitation of the present study is related to the assessment of the exposure. Participants responded to a single question about “migraine or frequent headache”, which—one the one hand—refers to a specific neurological disorder (migraine) and —on the other hand—refer to a relatively unspecified symptom (headache). The latter could be due to TTH, but we cannot preclude that for some participants, the frequent experience of headache is secondary to another disease. The response options “Yes, I have now” and “Yes, I have had” may also cause challenges in the context of disorders that occur in attacks. Furthermore, we lack information about the frequency and severity of migraine attacks, which could potentially range from yearly to weekly or even daily attacks. As migraine is usually underdiagnosed (Lipton et al., 2013; Viana et al., 2020), we assume that participants with relatively seldom and undiagnosed migraine attacks will classify themselves as non-exposed perhaps leading to a slight underestimation of the association between migraine/frequent headache and work ability. It is noteworthy that also participants with previous migraine or frequent headache reported poorer work ability than participants without headache. One contributing explanation could be that these participants still have headaches, although these do not occur frequently as mentioned in the question. Also, information about use of medication may be biased, as participants may not recall exact information about type of medication (particularly if they did not bring it to the examination) and the frequency of their use of this medication. We expect, however, that those who routinely use medication (e.g., daily) are more likely to recall product name and frequency of use.

Another contributing explanation for our findings could be the clustering of headache disorders with other health-related factors, which was partly taken into account in the analyses with adjustment for depressive symptoms and musculoskeletal pain. In these latter analyses, the estimates were substantially attenuated, and only for work ability related to the physical demands and the ability of remembering things, we found a signal of an association. While depressive symptoms and musculoskeletal pain often co-occur with a headache disorder (Hung et al., 2016), the temporal relationship may be difficult to determine. Importantly, in the cases where severe or chronic headache has a profound effect on quality of life and wellbeing, this condition is likely also to influence mood and the experience of other pain conditions (Buse et al., 2013).

MOH is formally defined as headache occurring on >15 days/months in patients with a pre-existing primary headache and developing as a consequence of regular overuse of acute or symptomatic headache medication (on ≥10 or ≥15 or more days/month depending on the medication) for more than three months (Headache Classification Committee of the International Headache Society (IHS), 2018). With the data at hand and the response options used in the interviews to assess the frequency and use of medication, we could not differentiate between those using medication 1–2 days/week (which would not qualify as MOH) and those using medication 3–6 days/week (which could qualify as MOH).

Therefore, we decided to operate with the category of possible MOH when the participant reported migraine/frequent headache and daily use of medication and group the remaining less certain MOH cases into a separate group. Despite the limitations regarding the operationalization of MOH and the misalignment with clinical definitions and criteria, it is still a major strength of the current study that we have access to
information about use of self-reported over-the-counter medication, which is absent from register-based studies using information about redemption of medication. Furthermore, our definition of MOH may even be considered as conservative, as we required more frequent use of medication (daily) although the duration of this intake of medication was unknown.

We used single item measures of demand-specific work ability (Avlund et al., 2014), which enabled us to capture which specific domain of the participants’ work ability that differed according to the migraine/frequent headache status. Thus, compared with composite measures of global work ability, e.g. the work ability index (ILmarinen, 2006), our single-item measures are perhaps less valid. Yet, for the purpose of the present study, combining the single items into a single work ability-score would cover important differences in the association between headache disorder and demand-specific work ability. Information bias due to differential misclassification of demand-specific work ability may be a concern in the present study, as we cannot rule out that participants, who are severely affected by a headache disorder recall their work ability differently and pay more attention to situations, which they had difficulties managing, than participants without a headache disorder. This mechanism would lead to an overestimation of the association between the headache disorder and demand-specific work ability.

We deliberately chose not to adjust for physical and psychosocial job demands in the present study. First, from a methodological perspective, self-reported measures of physical and psychosocial job demands encompass a subjective evaluation of that specific type of demand, which is also likely to be influenced by that individual’s health status yielding information bias (Persson et al., 2012). The measures of job demands would resemble the measures of work ability and including them in statistical analysis would yield an over-adjustment. Second, from a conceptual perspective, an individual’s work ability is reflecting the match between that individual’s resources, e.g. health-related, and the demands of the job (Wang et al., 2016). Therefore, an employee’s work ability cannot be seen as independent from (i.e., adjusted for) the job demands.

MOH is a secondary headache and a major cause of chronic headache affecting around 2% of the population (Westergaard et al., 2020). We used self-reported information about prescribed and over-the-counter-analgescics and categorized participants with migraines/chronic daily headache as we defined possible MOH-cases with implications for these cases’ work ability. We found that participants with current migraine/frequent headache, who did not use medication or who used medication daily, had poorer physical work ability than those without migraine/frequent headache. No medical treatment as well as overuse of medication indicate suboptimal treatment and lack of medical counselling. The possibility of identifying a clear pattern is, however, hampered by the relatively low statistical power in these analyses, as the exposed groups were small, and the potential association between possible MOH and work ability needs to be confirmed in other studies.

As the study was cross-sectional, we are unable to investigate the temporal relation between headache disorders and work ability or changes in work ability with the introduction of a headache disorder. Furthermore, we cannot preclude the possibility of reverse causation in the sense that the experience of suboptimal functioning at work may perhaps elicit a stress response that triggers episodes of headache (Appel et al., 2020; Urhammer et al., 2020).

In terms of generalizability, we expect that the results of the present study apply to middle-aged adult populations with different durations of vocational education and with a headache disorder not preventing them from being occupationally active. Our results suggest that particularly physical and cognitive demands might be difficult for these employees to comply with. Most likely due to the age-distribution of our study population, the prevalence of headache disorders were lower than observed in other population-based studies. Interestingly, in the present study, most of the participants (80.5-81.4%, Table 1) were full-time employees, regardless of migraine/frequent headache status. Thus, despite that headache disorders are associated with unemployment, sickness absence and underemployment, the majority of those who are indeed occupationally active, have full-time jobs. Therefore, we suspect that the present data do not contain very severe migraine cases, as occupational activity was an obvious inclusion criterion in this study. Thus, in other populations including more severe cases, the association with work ability may be even stronger than in our study.

5. Conclusion

Overall, participants with a headache disorder assessed as self-reported migraine or frequent headache had poorer work ability across all measures of demand-specific work ability. The strongest associations were found for difficulties handling physical demands, remembering important things, and decision-making. Current headache, combined with either no medical treatment or overuse of medication—both signalling suboptimal treatment and medical counselling—were associated with poorer demand-specific work ability.

Depressive symptoms and musculoskeletal pain seem to play a major role for the level of disability among individuals with a headache disorder as defined in the current study. Hence, efforts aiming at improving work ability and thereby a sustainable attachment to the labour market should preferably adopt a multi-faceted approach taking both neurological, mental and physical health conditions into account, i.e., by managing co-occurring pain or mood conditions or introducing non-medical treatment options such as supervised physical activity. As a direct implication of the findings of the present study, adjustment of work demands is another promising avenue for improvement of work ability among employees with headache disorders.

Authors’ contributions

JLS, KT and KNN conceived of the presented idea. ÅMH contributed to the collection of CAMB data. JLS, VR and KNN performed the analyses. JLS wrote the manuscript with support from KNN. KNN revised the manuscript after peer-reviews. ÅMH, KT and JMH critically reviewed the draft of the paper and contributed to the interpretation of the findings and their implications for occupational health. The paper has been read and approved by all authors.

Conflicts of interest

JLS, KT, JMH, ÅMH, VR and KNN declare no competing interest.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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