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ORIGINAL RESEARCH ARTICLE

# Perceived Work Ability: A Constant Comparative Analysis of Workers' Perspectives

**Alyssa K. McGonagle[1] · Tarya Bardwell[1] · Jonathan Flinchum[1] · Kathryn Kavanagh[1]**

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## Abstract

Perceived work ability, or one's perceived ability to continue working in their current job, is important to understand in order to inform efforts to retain talent and promote worker well-being. The current study offers a unique contribution by taking an inductive approach, giving participants voice to describe their own work ability experiences. Participants ($N = 301$) who were working at least 30 h a week in the U.S. and reported one or more hindrances to work ability responded to four open-ended questions about hindrances to work ability, individual strategies for maintaining work ability, and employer supports for maintaining work ability. Using constant comparative analysis, we corroborated existing work ability research and theory, along with unique contributions that enhance our understanding of perceived work ability. Notably, non-work demands, such as family obligations and lack of financial resources are under-examined, yet emerged as important work ability hindrances in this study. We also uncovered several personal strategies to help maintain WA (e.g., maintaining health and using work strategies to optimize functionality) that are dependent upon available job resources (e.g., support, autonomy, and flexibility). Ultimately, job resources of support, job control, and flexibility emerged as the most powerful leverage points for organizations to help workers maintain WA. Findings suggest that future efforts to support workers' work ability should include these resources.

**Keywords** Perceived work ability · Job resources · Personal resources · Inductive research · Qualitative study

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✉ Alyssa K. McGonagle
amcgonag@uncc.edu

[1] Department of Psychological Science, University of North Carolina at Charlotte, 9201 University City Boulevard, Charlotte, NC 28223-0001, USA

## Introduction

Perceived work ability (PWA) refers to the degree to which employees perceive that they are able to continue working in their current jobs (Brady et al., 2020). Work ability (WA)[1] research originated in the 1980s when the Finnish Institute of Occupational Health (FIOH) examined various predictors of early retirement of Finnish municipal workers (Ilmarinen et al., 1991a, 1991b). Yet, only recently has PWA garnered interest in the psychological and organizational literatures. The surge in interest in PWA is perhaps due to research findings demonstrating the robust predictive power of PWA as a leading indicator of worker absence, disability leave, and retirement (e.g., Ahlstrom et al., 2010; McGonagle et al., 2015) and PWA's association with well-being (e.g., Tavakoli-Fard et al., 2016; Walker et al., 2015). The U.S. workforce is aging (CDC, 2015); furthermore, at least 52 percent of adults in the U.S. have one or more chronic health conditions (Boersma et al., 2020) and this percentage is rapidly increasing due to long-haul COVID, which affects as many as 30% of those who contract COVID-19 (Logue et al., 2021). It is therefore important for researchers and organizations to understand PWA to retain talent and promote worker well-being.

To date, PWA research has been largely deductive, and the most commonly-applied theory to understand PWA is the job demands-resources model (JD-R; Demerouti et al., 2001). The JD-R states that chronic job demands are depleting and may lead to exhaustion, burnout, and strain, whereas job resources are motivating and lead to engagement and well-being. In line with the JD-R, research has found that predictors of PWA include job resources, such as supervisor support, coworker support, and autonomy (McGonagle et al., 2015), developmental practices (Pak et al., 2021), and perceived justice (Brady et al., 2020). Job demands have also been found to negatively relate to PWA (e.g., workplace mistreatment; Brady et al, 2020; Kabat-Farr et al., 2019; physical demands, unfavorable body positions, and negative environmental conditions; McGonagle et al., 2015). In addition, personal resources, more recently added to the JD-R (Bakker & Demerouti, 2017), are robustly related to PWA. Examples include health perceptions and sense of control (Brady et al., 2020; McGonagle et al., 2015).

Although this deductive approach using the JD-R has yielded considerable insights into PWA predictors, it is likely others exist. For example, the JD-R excludes non-work demands (e.g., family obligations; financial stressors) that may affect workers' PWA. In general, deductive research, while informative, inherently limits the variables investigated to those specified a priori by the researcher(s).

[1] In the work ability literature, "PWA" refers to perceived work ability, or individuals' perceptions of their own levels of work ability, whereas "WA," or work ability, typically refers to work ability that is *not* solely subjectively assessed, but is more comprehensively assessed (commonly, by the Work Ability Index, which includes several measures of both subjective and "objective" measures, such as presence of diseases diagnosed by a physician). In this paper, we use the term "PWA" when specifically referring to workers' perceptions of their own work ability, and "WA" when referring more generally to work ability that is not solely subjectively perceived. For more information on distinctions between WA and PWA, see Brady et al. (2020) and McGonagle et al. (2015).

Inductive research is valuable alongside deductive research to expand understanding and provide new insights into phenomena (Woo et al., 2017), which may be used to inform theory and future research. Relatedly, an inductive, qualitative approach allows employees to explain themselves in their own words when responding to prompts. Not only does this approach provide potential novel avenues in understanding PWA (e.g., new predictors of PWA), but it also centers employee perceptions, which are critical to understanding demands, resources, and PWA (i.e., perceptions of work ability). For example, demands may be appraised as challenging or hindering, and resources may be perceived as positive or threatening depending on how employees perceive them (Schaufeli & Taris, 2014; Searle & Auton, 2015; Webster et al., 2011). Inductive methods can illuminate these varied perceptions, providing a more granular understanding of PWA. Therefore, we take an inductive, qualitative approach in this study with goals of attaining a potentially more nuanced understanding of PWA and making recommendations for theory and research on PWA.

We contribute to the literature, first, by seeking to expand beyond known predictors from the JD-R model using this inductive approach. We ask what workers are thinking about when they are assessing their WA levels – beyond the aforementioned predictors of PWA, what other important hindrances to PWA may exist? An inductive approach can provide additional exploration of predictors of PWA, perhaps going beyond our scope of known predictors of PWA along with additional worker populations that are vulnerable to declines in PWA. In doing so, we may replicate previously identified predictors of PWA in addition to uncovering under-recognized factors that affect PWA. Such findings may also inform theoretical frameworks for understanding PWA – as noted, the JD-R, for example, excludes non-work demands. We discuss our findings in relation to theories that may integrate lesser-known PWA predictors outside the scope of the JD-R.

A second contribution of this study to the literature relates to intervention. Because PWA is a known leading indicator of absenteeism, turnover intentions, and premature workforce departure, and the numbers of individuals who are vulnerable to WA declines (through, for example, aging and/or chronic health conditions) is increasing, intervening to improve WA is critical for individuals and organizations. We use an inductive, qualitative approach to gather workers' perceptions about various individual/personal and organizational strategies that help them (or could help them) maintain and improve their WA. We see this as critical information that may be used alongside existing PWA findings when planning and implementing WA interventions. We discuss findings within the current literature to point out new insights and directions for future research.

In sum, to help expand our understanding of PWA and inform PWA theory and intervention, we use an inductive, qualitative approach to understand workers' perceptions of hindrances to their WA, along with their own individual strategies to help maintain their WA and organizational strategies that currently help them or could help them maintain their WA.

Research Question 1: What hindrances do workers report that impede their WA?
Research Question 2: What individual strategies do workers employ to help maintain their WA?

Research Question 3: How do workers perceive that their employing organizations help them with maintaining their WA?
Research Question 4: What do workers perceive that their employer could possibly do to help them maintain their WA?

## Qualitative Approach

We used constant comparative analysis (CCA), a qualitative method in which responses are coded into initial emergent themes and then are subject to constant revisiting and revision until no new codes emerge (Hewitt-Taylor, 2001). Glaser (1965) described CCA as a convergence of a quantitative approach (providing categories or frequency data) and theoretical contribution. Accordingly, we evaluated frequencies of responses in thematic categories that emerged from participant responses and applied findings to update the WA JD-R framework. In this way, we take an inductive approach to categorizing and describing the prevalence of participants' responses and use these findings to propose ways in which the JD-R model is currently limited or may be expanded in terms of its understanding of PWA. We discuss findings in light of existing research on WA interventions and propose future directions for intervention.

## Method

### Participants and Procedure

The data used in this study were from a larger data collection on worker health and well-being that occurred in summer 2018. Participants (limited to individuals 18 years and older in the U.S. working at least 30 h per week) were recruited through Amazon's MTurk to complete a 20-min online survey and were paid $3.00. Initially, 900 employees responded to the online survey. After removing those who responded to less than half of the survey questions, completed the entire survey in less than seven minutes, and/or failed checks of attentive responding (e.g., "Please select neutral in response to this question"), 850 participants remained. Further, we only retained participants who reported one or more hindrances to their WA because we focused this study on those who are vulnerable to WA declines ($N = 362$). This also helped ensure we were coding meaningful responses to the latter questions—if someone did not report any possible hindrances to their WA, a question about strategies to maintain their WA is likely irrelevant. After coding responses to the question about hindrances, we removed 62 participants who typed responses to the question about WA hindrances that were not actually hindrances (e.g., "I only have a minor cold…it has not effected [sic] performance in any measurable way.") A final sample of 301 participants was analyzed.

**Table 1** Participants' industries and chronic health conditions (frequencies and percent of sample)

| | *f* | % |
|---|---|---|
| Industries | | |
| Education, Training, and Library Occupations | 36 | 12.0 |
| Sales and Related Occupations | 34 | 11.3 |
| Office and Administrative Support Occupations | 33 | 11.0 |
| Management Occupations | 29 | 9.6 |
| Business and Financial Operations Occupations | 22 | 7.3 |
| Computer and Mathematical Occupations | 20 | 6.6 |
| Arts, Design, Entertainment, Sports, and Media Occupations | 18 | 6.0 |
| Life, Physical, and Social Science Occupations | 17 | 5.6 |
| Healthcare Support Occupations | 15 | 5.0 |
| Healthcare Practitioners and Technical Occupations | 14 | 4.7 |
| Legal Occupations | 10 | 3.3 |
| Production Occupations | 9 | 3.0 |
| Food Preparation and Serving Related Occupations | 7 | 2.3 |
| Installation, Maintenance, and Repair Occupations | 7 | 2.3 |
| Transportation and Material Moving Occupations | 6 | 2.0 |
| Architecture and Engineering Occupations | 5 | 1.7 |
| Community and Social Service Occupations | 5 | 1.7 |
| Personal Care and Service Occupations | 4 | 1.3 |
| Building and Grounds Cleaning and Maintenance Occupations | 3 | 1.0 |
| Farming, Fishing, and Forestry Occupations | 3 | 1.0 |
| Construction and Extraction Occupations | 3 | 1.0 |
| Protective Service Occupations | 1 | 0.3 |
| Chronic Health Conditions | | |
| Mental Health Condition | 27 | 9.0 |
| Cardiovascular Disorder | 20 | 6.6 |
| Autoimmune Disease | 19 | 6.3 |
| Musculoskeletal Disorder | 16 | 5.3 |
| Lung Disease | 13 | 4.3 |
| Diabetes | 12 | 4.0 |
| Arthritis | 10 | 3.3 |
| Gastrointestinal Disorder | 10 | 3.3 |
| Neurological Disorder | 6 | 2.0 |
| Other Chronic Health Condition | 12 | 4.0 |

$N = 301$. $f$ = frequency and % = percent of the total sample. Participants selected their industries from a list of 23 O*NET-SOC codes. Participants self-reported their chronic health conditions by typing them into an open-ended survey question and the authors coded the responses to create categories

Fifty-seven percent of participants identified as female, 43% identified as male, and 0.3% as non-binary or gender fluid. Participants were an average of 37.95 years old ($SD = 9.91$). Most participants (62%) reported having either a four-year college degree (45%) or a graduate degree (17%). Eighty-one percent of participants

identified as White or Caucasian, 6% as Black or African American, 5% as Asian or Asian American, 4% as Hispanic, Latina(o), and 2% as multi-racial. Forty-five percent of participants reported experiencing chronic pain, and 43% reported having one or more chronic health conditions besides pain (see Table 1). Participants had an average organizational tenure of 6.89 years ($SD = 5.62$) and reported working an average of 42.69 h per week ($SD = 5.69$). Participants' O*NET-SOC industry categories are in Table 1.

## Measures

**Open-Ended Questions** Four open-ended questions were prefaced by the following statement, "Work ability refers to your capacity to continue doing your current job, given your health and other resources, in light of your job responsibilities." (1) "Does anything currently hinder or impede your work ability (either personally or work-related)? Please describe below." (2) "Are there any strategies that you personally use to maintain your current level of work ability? Please describe below." (3) "Is there anything your current employer does and/or anything about your job that allows you to maintain your work ability? Please describe below." (4) "What could your employer possibly do to help you maintain or improve your work ability? Please describe below."

## Analysis Strategy

We used constant comparative analysis (CCA). Based on insights from Glaser and Strauss's (1967) seminal work on grounded theory, CCA can be understood as "an iterative and inductive process of reducing the data through constant recoding…[to allow] possible core categories to emerge" (Fram, 2013, p. 3). CCA relies heavily on coding, which is the labeling and systematizing of data resulting in a collection of codes (Tracy, 2013). We used the same coders for each subset of the data at each phase of the study – primary and secondary coding – with the exception of one research assistant, who was brought in during the second phase of coding only. Using the same coders for each subset was important because having different coders at each phase could introduce different perspectives, understandings, and backgrounds, which could affect how the codes were created and applied. We had ongoing, regular check-ins to discuss disagreements and recalibrate our coding (Richards & Hemphill, 2018).

**Primary-Cycle Coding; Open Coding** Primary-cycle coding includes initial coding activities that result in first-level codes describing "what" the data present (Tracy, 2013). Our coding process began with all authors open coding participants' responses to the first question. Codes are words or short phrases that capture important aspects of the data at-hand (Tracy, 2013). The authors then met and discussed preliminary results of this coding, talking through any questions and coding discrepancies. All authors then finished open coding the other three questions based on this discussion, focusing only on participants who reported hindrances to their WA in question one. During this process, we noticed that many respondents listed multiple problems, some of which seemed interactive and some of which appeared to be independent.

For example, an interaction of a bad back and unsupportive office chair might both interfere with one's WA. Sometimes two seemingly unrelated concepts, such as poor sleep and difficult-to-use software at work were listed. In our group discussion, we recognized that the data called for the option of multiple codes per respondent.

**Primary-Cycle Coding; Axial Coding and Codebook Development** Next, all authors axial coded results by reassembling or "lumping" data that were fractured during open coding (Tracy, 2013). Due to the varying levels of specificity (both in dimensions and properties), we recognized a natural structure for sub-coding in the data. The use of sub-codes allowed us to identify multiple properties while being as specific as possible. An example of an axial (parent) code, if a participant mentioned that their PTSD interfered with their WA, we would not only identify the sub-code "chronic mental health condition," but also the parent code of "health." This parent code, which captures responses that describe the same mechanism, would also include participants who report physical health conditions because the same principle of "health" was affecting their WA. This sub-coding also enabled us to identify as many layers as the data presented; for example, if someone said they were having health problems, and was no more specific, we would solely code it as "health". However, if they mentioned having ongoing pain, we used the parent code "health" and the sub-code "chronic pain."

The authors met after axial coding all data to address questions and coding discrepancies. The codes that we did not all inherently agree on led to an in-depth discussion of how to develop a codebook, and our creation of an initial codebook. Consistent with CCA, we did not impose the JD-R model onto the development of the codebook, although some consistencies emerged.

**Secondary-Cycle Coding; Focused Coding** All authors then began secondary-cycle coding, which used the codebook to re-evaluate all data. This involved re-coding a subset of participant responses using the codebook and then meeting to discuss questions, add/revise codes within the codebook, and resolve discrepancies. A research assistant joined us during this phase, offering an outside perspective and supporting the dependability of our coding. Initially, we re-coded a subset of participant responses (20 responses per coder) using the codebook. We then met to discuss questions, resolve discrepancies, and talk through our coding criteria for responses to reduce future discrepancies, update the codebook, and make the resolving processes more efficient in the future.

**Secondary-Cycle Coding; Final Focused Coding** Last, the authors and research assistant coded all participant data a final time using the revised codebook. All responses were coded by two researchers. To evaluate the initial level of agreement, we calculated Cohen's kappa for the parent codes (Question 1 = 0.78, Question 2 = 0.69, Question 3 = 0.65, Question 4 = 0.64). Then, we met as a group to discuss code definitions and disagreements. Next, each coder pair had one-on-one meetings and resolved any remaining discrepancies. After resolving disagreements, we tallied themes for reporting using frequencies of parent- and sub-codes. Tables 2, 3, 4, and 5 display frequencies, descriptions, and examples.

**Table 2** Question 1 work ability hindrances: parent codes, sub-codes, frequencies, descriptions, and examples

| Parent Code (*f*) | Sub-code (*f*) | Description | Example response |
|---|---|---|---|
| Health (222) | | This parent code includes various health conditions as hindrances to work ability | |
| | Chronic physical health condition (84) | Ongoing physical health condition that requires some form of management and/or impairs function (e.g., rheumatoid arthritis, asthma) | "I have relapsing multiple sclerosis, and I occasionally have days where I cannot work due to symptoms. Especially as Director, if I am suffering from certain symptoms, I need to take a day off." |
| | Chronic mental health condition (40) | Ongoing mental health condition that requires some form of management and/or impairs function (e.g., depression, addiction, PTSD) | "I suffer from depression and some days it is like I am in a fog and it does make it difficult to concentrate." |
| | Chronic pain (24) | Ongoing pain as a symptom, either in addition to another specified chronic health condition or on its own | "… since I got hit by a car…it is painful for me to sit at a desk for long periods of time. I have to get up frequently to either stand at my desk, or walk around a bit, go somewhere to stretch my back, neck, legs. A lot of employers do not understand this because they can't "see" the injuries…" |
| | Sleep problems (22) | Issues related to insomnia and/or poor quality or quantity of sleep | "I think my sleeping pattern is so off that I'm usually half asleep at work and unable to focus correctly on intelligence reports and phone call details. I have to be very awake at work to make sure I don't [miss] any small details." |
| | Feelings of stress or burnout (17) | Experience of acute or chronic stress, burnout, or other reported mild mental health issues that don't rise to the level of a diagnosed mental illness | "Currently feeling burnt out due excess of work through first part of the year." |
| | Chronic fatigue (12) | Ongoing fatigue as a symptom, either in addition to another specified chronic health condition or on its own | "I frequently suffer from unexplained fatigue that hinders my quality of work." |
| | Acute physical or mental health condition (11) | Acute issue such as a cold, flu, having an injury that is expected to heal, or temporarily having insomnia after a traumatic event | "I broke my ankle 6 months ago and had to be in a wheelchair/crutches. Now I'm walking again but I'm not up to full speed yet so it does hinder my ability to get around the school quickly." |
| | Pregnancy (6) | The participant reports being pregnant or recently given birth | "The only thing that would slightly impede/hinder my work ability is that I am 6 months pregnant." |
| | Aging (6) | General comments about health-related effects of aging that do not fit another health sub-code | "Nothing specific, just getting older in general, sometimes having fatigue, mental cloudiness, concentration problems." |

**Table 2** (continued)

| Parent Code (*f*) | Sub-code (*f*) | Description | Example response |
|---|---|---|---|
| Job Demands, and Stressors (62) | | This parent code includes aspects of work as hindrances to work ability | |
| | Social/Emotional Demands (13) | Social and/or emotional demands that are not captured under "coworkers" or "supervisors" (e.g., dealing with customers or general social or emotional demands) | "We deal with a lot of horribly sexually abused kids and sometimes it can be very very hard mentally." |
| | Supervisors (12) | Issues with supervisors or managers | "…My work ability is also impeded when my supervisor pressures me to work faster when I am working as hard as I can on days when others are off sick." |
| | Coworkers (11) | Issues with coworkers or teammates | "The only thing is I really dislike my team, so the mental/social hurdle of having to interact with them on the daily is VERY tiring and distressing at times." |
| | Time pressure (6) | Too much work to do in too little time | "I am sometimes overwhelmed by the amount of work I have to do and how little time I have to do it." |
| | Lack of Resources (6) | Lacking necessary resources to optimally do work (e.g., technology, staff) | "The biggest factor to impact my work ability would be setbacks in resources that would come from outside sources. There are times where my boss will not provide a piece of technology or provide the financial back to complete certain projects." |
| | Scheduling (4) | Issues with scheduling work | "Inconsistent schedule" |
| | Physical Demands (4) | Physically demanding aspects of work that exceed participants' abilities | "Although I work in an office, I sometimes have to lift heavy boxes. I struggle with that because my heart isn't 100%" |
| | Other Work Characteristics (6) | These included tediousness of work, environment (heat), presence of safety hazards, anticipated discrimination, and bureaucracy | "Handling of dangerous and volatile chemicals using for experiments could hinder my work ability" |

**Table 2** (continued)

| Parent Code (*f*) | Sub-code (*f*) | Description | Example response |
|---|---|---|---|
| Family or Home Life Demands / Stressors (47) | | This parent code includes aspects of family or personal lives as hindrances to work ability | |
| | Children (17) | Issues directly related to child care or other parenting issues | "The only thing that hinders my work abilities are my responsibilities as a parent to my autistic son." |
| | Family issues or obligations (11) | Family-related issues or obligations that do not directly reference children or dependent adults | "I work from home so sometimes my family life interferes with my ability to work right at that moment |
| | Personal life – unspecified (7) | Issues referred to as general "personal life" issues that do not identify a specific issue or family member | "Problems in my personal life sometimes enter my mind and preoccupy me at work, which hinder my efficiency at work." |
| | Dependent adults (4) | Issues stemming from dependent adult care | "My mother has just been recently diagnosed with dementia and I am having a difficult time especially focusing on work because of this." |
| | Financial issues (4) | Issues related to personal finances | "I am under a lot of stress due to my personal financial situation and this sometimes affects my ability to focus at work." |
| | Other life demands (4) | Issues related to home purchasing and renovation, volunteering, and work-school conflicts | "The work schedule is pretty demanding and I have tests and other things I prepare for outside my job hours." |
| Other (4) | | This parent code includes other hindrances to work ability that do not fit into one of the other parent codes – specifically, transportation issues (2) and personality fit with the job (2) | "I am a very shy person, and that sometimes interferes with my ability to provide clear communication with others about what I need."<br>"I miss work whenever my car breaks down because I only have one car and I do not have any friends to drive me to work." |

$N = 301$. $f$ = frequency of the parent- or sub-code. Each participant response could contain multiple parent and sub-codes. Parent codes are listed in order from most to least frequent within each question; sub-codes are also listed this way within each parent code

## Findings and Discussion

Coding results are detailed below, separated into sub-sections by research question. Each second-level heading in this section represents a parent code, and parent codes and sub-codes are listed in order from most to least frequent within each question (parent codes) and parent code (sub-codes). We only provide examples of participant quotes for the most frequent sub-codes for the sake of space; however, sample quotes are provided for all sub-codes in Tables 2, 3, 4, and 5. Figure 1 displays results: hindrances affecting PWA, and individual strategies and organizational supports having direct paths to PWA as well as paths through alleviating hindrances to PWA.

### Work Ability Hindrances

All hindrance-related parent codes, sub-codes, frequencies, descriptions, and example responses are in Table 2.

**Health** Health-related issues were the most commonly reported hindrances to WA. Within the parent code "health," the sub-codes include: chronic physical health conditions (e.g., rheumatoid arthritis, diabetes), chronic mental health conditions (e.g., depression), chronic pain, sleep problems, feelings of stress or burnout, chronic fatigue, acute health conditions (e.g., broken bone), pregnancy, and general health issues that participants attributed to aging. As an example of a chronic physical health condition, one participant said, "*I was diagnosed with a neurological problem with my stomach around 5 years ago. I am better and back to full-time work but my body is not as strong as it once was. I get tired quicker.*"

Many participants described not only their specific health issue, but also how that issue interacted with their job characteristics to affect their work. For example, one said, "*Well my job requires sitting down for long periods of time and I have 14 titanium rods attached to my spine along with scoliosis so if I am sitting down too long, my back begins to hurt really bad.*"

**Job Demands and Stressors** Job demands and stressors are various aspects of work that impeded participants' WA and include: social-emotional demands, supervisor and coworker issues, time pressure, lack of resources, scheduling, physical demands, and other work characteristics. An example response coded as social-emotional demands is, "*Relationships with people at work are effortful and discouraging, sapping my ability to work with customers effectively.*" An example response coded as a supervisor-related issue is, "*Lack of proper management…lack of proper information…lack of proper hiring methods, lack of proper training…and lack of standard operating procedures/enforcement of them for everyone.*"

**Family or Home Life Demands and Stressors** Family or home life demands and stressors include those related to children (e.g., "*I do have a daughter who is one year old so sometimes once in a while it can get in the way with trying to find a baby*

**Table 3** Question 2 individual strategies to maintain work ability: parent codes, sub-codes, frequencies, descriptions, and examples

| Parent code (*f*) | Sub-code (*f*) | Description | Example |
|---|---|---|---|
| Caring for Health/ Self Care (119) | | This parent code includes strategies related to health and self-care to maintain work ability. This excludes taking medication, which is in the following parent code | |
| | Exercise (42) | Various forms of physical activity or movement (e.g., walking, strength training, yoga) | "Working out regularly boosts my mood and makes it so that it is generally easier for me to fall asleep at an earlier time." |
| | Diet (28) | Introducing a healthier diet and/or eliminating problematic foods or drinks (e.g., soda, alcoholic beverages) | "I have removed caffeine from diet and resourced to more natural energy with high-energy healthy snacks." |
| | Sleep (20) | Getting adequate sleep and/or practicing good sleep hygiene | "I try to get to bed by a certain time each night." |
| | Resting (8) | Getting rest outside of work | "I rest a lot in the afternoon after work." |
| | Meditate (6) | Meditating | "I try to calm myself with meditation in stressful situations…" |
| | Attend medical appointments (5) | Keeping up with medical appointments, including physical therapy and psychological therapy | "I make sure I keep up with appointments and keep my health in check." |
| | Other pain management (5) | Other strategies besides the ones mentioned above to manage pain | "Ice my back…." |
| | Stay hydrated (5) | Staying hydrated | "I make sure I am hydrated, and that I keep a steady sense of focus by eating early and being prepared for the day ahead." |

**Table 3** (continued)

| Parent code (*f*) | Sub-code (*f*) | Description | Example |
|---|---|---|---|
| Assistive Devices, Substances, and Medication (60) | | This parent code includes assistive devices (e.g., canes to walk), substances (e.g., caffeine), and/or medications to maintain work ability | |
| | Medications (34) | This includes all medication (over the counter, "natural," and prescribed) to help the worker maintain work ability | "I take about 4 aspirin so I can keep up my regular pace at work. I have also taken CBD oil to help with the pain." |
| | Caffeine (18) | This code is specifically for references to caffeine (e.g., coffee, energy drinks) as a substance to help work ability | "I will either bring energy drinks with me to work to keep my energy levels going, or I will in extreme circumstances, take caffeine pills, so that I am in a more wired and active mindset. I feel like without the caffeine, all I can do is crash and burn." |
| | Assistive Devices (8) | These include devices, such as visual aids, braces, and splints, to help aid work ability | "I use a splint and have taught myself to type with it on." |
| Efficient Work (56) | | This parent code includes strategies related to working efficiently as a way to maintain work ability | |
| | Scheduling work (21) | Mainly focused on scheduling work to be done when one is able to optimally function | "Plan the work—Work the Plan. I have to plan the work when I have the energy and then make sure I complete the work before my fatigue sets in." |
| | Organizing work (14) | Mainly focused on organizing work to enhance work ability | "I am good at deciding what I need to do versus what I want to do; I make list and check off items as I complete them; I feel that I am organized and maybe a little controlling to ensure things are getting done." |
| | Productivity hacks (9) | Mainly focused on specific tips or tricks to help one maximize work ability | "Things that I can do slowly or break into segments, I do so. For example, rather than verify my receipts and do my reports and separation by payment type, I might separate the types first, verify that all receipts are present by type at another point, then verify at another point and so on." |
| | Pace work carefully (4) | Maintain a sustainable pace of work | "I try to pace myself to be sure that I can complete all required tasks without overexerting myself." |
| | Other (8) | Other strategies for working efficiently to maximize work ability, including delegation and double checking work | "I shut my door to keep people from talking to me about things I don't care about." |

**Table 3** (continued)

| Parent code (*f*) | Sub-code (*f*) | Description | Example |
|---|---|---|---|
| Coping/Stress Management Strategies (45) | | This parent code includes various coping and/or stress management strategies to maintain work ability | |
| | Positive mindset/attitude (22) | This includes positive thinking, including reframing the situation to see things in a more positive way | "I just try to always keep a positive attitude and just keep going. It's amazing how much having a good attitude can help you juggle things." |
| | Disengaging (7) | Disengaging from work or from people at work to manage stress | "Try to ignore my team members, listen to music, stay silent and don't engage when I don't want to talk." |
| | Breathing, meditation, prayer (5) | This includes breathing exercises, mediation, prayer, and using music to regulate emotion | "I try to make time to meditate during the day at least a couple of times a week." |
| | Getting social support (5) | Engaging with others socially at work to manage stress | "I talk to teachers in my department – for curriculum and teaching ideas, but also as a critical venting opportunity." |
| | Other (6) | This includes general "stress management" or "coping" responses | "I take medication and use basic coping methods taught to me by a BCT therapist." |
| Breaks/Recovery (40) | | This parent code includes taking breaks and/or finding ways to get away from work in order to maintain work ability | |
| | Taking active breaks (17) | Active breaks include, for example walking, standing, and/or stretching | "Yes, get up, stand instead of sit, stretch, on breaks I take short walks to work out the "kinks" as I call them." |
| | Taking restful breaks (17) | Restful breaks are those in which the worker focuses on relaxing and/or disengaging from work | "Try to calm down during work. Take more breaks when needed and relax right after work is over for a bit to "calm" down." |
| | Other (6) | Other types of breaks or general breaks wherein the activity is not specified | "I try to focus by tuning others out and taking regular breaks (same time each day)." |

**Table 3** (continued)

| Parent code (*f*) | Sub-code (*f*) | Description | Example |
|---|---|---|---|
| Work-Life Strategies (35) | | This parent code includes strategies related to work-life balance as a way to maintain work ability | |
| | Work-life boundaries (15) | Maintaining strong boundaries between work and non-work life | "I try to focus just on the task at hand and not deal with my personal issues even when I'm at break because then my emotions follow me back after break. I also wear a rubber band to snap on my wrist if I find myself getting caught up in my own life instead of my work." |
| | Time off (9) | Taking time off, whether paid or unpaid | "Utilize vacation and all sick time when needed. Some days its just for mental health…" |
| | Outside fun (3) | Hobbies and other activities outside work | "I enjoy my free time and focus on hobbies and things that make me happy so that I'm not stressed out and not wanting to go to work. Keeping happy outside of work helps me be a good employee at work." |
| | Use flex-time and flex-place (5) | Using flexibility to help maintain work ability | "I perform a lot of work in off-hours and off-site via mobile technology." |
| | Use support (3) | Using support from friends or family to help with work-life issues in order to maintain work ability | "Some strategies I personally use to maintain my current level of work ability is to try to always have a back up when emergencies occur, whether it is someone to tend to my children or someone to cover for me at work." |
| Focusing on work (31) | | This parent code includes strategies related to staying engaged and focused at work – in general or on the task at hand—in order to maintain work ability | "I try to close my mind off from other thoughts and just [immerse] myself in the work I'm doing." |
| Nothing/N/A (23) | | This code reflects participants who said they do not use any strategies to maintain their work ability | "No strategies. I just work. It works out. I do my job well." |
| Keep pushing through (16) | | This parent code includes strategies related to "powering through" work or "toughing it out." | "I just continue doing my job in spite of the pain from my injury." |

**Table 3** (continued)

| Parent code (*f*) | Sub-code (*f*) | Description | Example |
|---|---|---|---|
| Job Skills, Training (11) | | This parent code includes ways to increase job skills and/or training or use job crafting to maintain work ability | "The most effective strategy I employ is going outside my work to utilize and assimilate information and skills that would allow me to be more effective at my job. This may mean a simple program course, and obtaining learning materials for a process that would be more effective in the current duties I am provided." |

$N = 301$. $f$ = frequency of the parent- or sub-code. Each participant response could contain multiple parent and sub-codes. Parent codes are listed in order from most to least frequent within each question; sub-codes are also listed this way within each parent code

*sitter or when she isn't feeling well i'm not able to make it into work which effects my ability to do my job*"), family issues or obligations that do not involve children or dependent adults (e.g., "*A family illness sometimes causes me a lot of stress which may impact my working abilities*"), personal life issues that were unspecified as to the family member involved, dependent adults, financial issues, and other life demands (e.g., volunteering, work-school conflicts).

**Other** Four responses did not fit any of the parent codes. These were about transportation issues (e.g., "*I miss work whenever my car breaks down…*") and individual differences not fitting with job requirements (e.g., "*I am a very shy person, and that sometimes interferes with my ability to provide clear communication with others about what I need*.").

**Discussion** In line with the JD-R model, Brady et al.'s (2020) meta-analysis found that, in general, job demands were negatively associated with PWA and job resources and personal resources were positively associated with PWA. Of job demands examined, mental and emotional demands (e.g., role conflict, surface acting) most strongly related to PWA, and of job resources examined, task resources (e.g., task significance and task variety) and coworker support most strongly related to PWA. This study also found positive relationships of personal resources (e.g., health, job self-efficacy, conscientiousness, coping, and grit) and PWA.

Our results corroborate these findings, as health-related hindrances were the most common type of hindrance reported. Given the preponderance of evidence linking health to PWA dating back to the initial FIOH studies, our results are not surprising; but they provide further evidence that people are primarily considering health when they think about their PWA. Further, as PWA has mainly been studied in aging workers in the organizational literature, we recommend PWA researchers expand their scope to include workers of all ages with physical and mental chronic health conditions.

Beyond health, some responses indicated a lack of tangible personal resources (e.g., financial issues, transportation) affected participants' PWA. Future research should consider expanding personal resources to include these. Interestingly, we did not see other personal resources beyond health (e.g., sense of control) emerge in participants' comments about hindrances in this study as they did in prior studies. However, naming sense of control as hindering PWA may require a level of introspection beyond what is elicited by a brief online survey. Further, responses to the individual strategies question provided insight into additional personal resources, including those related to grit and coping as Brady et al. (2020) found.

The most frequent job demands categories in our study—social-emotional demands, supervisor and coworker issues, and time pressure—also corroborate Brady et al.'s (2020) findings. One notable unique job demand-related finding from our study is that scheduling issues (e.g., inconsistent scheduling) hinder PWA. Scheduling issues may affect all workers, yet they are likely more common with blue-collar and service workers. We encourage researchers to include scheduling in

**Table 4** Question 3 ways that employers support workers' work ability: parent codes, sub-codes, frequencies, descriptions, and examples

| Parent code (*f*) | Sub-code (*f*) | Description | Example |
|---|---|---|---|
| Nothing/N/A (89) | | This code reflects participants who said their current employer does not do anything to aid their work ability | "There aren't any special processes or considerations that facilitate my ability to do my work." |
| Flexibility (85) | | This parent code includes employers and/or managers giving workers flexibility which aids their work ability | |
| | Flex-time (45) | Flexibility in scheduling work (timing of work) | "allows me to come in late on bad pain days and whenever I have a sleepless night. watches my station when I need to rest or reset a joint. steps in to help me focus when I start to have an anxiety attack [and] allows me to work late after my shift to finish tasks I couldn't focus on with typical restaurant chaos" |
| | Flex-place (27) | Flexibility in location of work | "My employer is very good about letting me work remotely. They are understanding of my family obligations and they know and appreciate that I still get my work done fast and at a high level." |
| | Time off or breaks without penalty (11) | Being able to leave work or miss work without penalty or take extra breaks from work (this excludes paid time off, which is coded under Other Job Resources—Benefits) | "If the pain becomes out of control the company will allow me to leave without punishment. I just lose hours." |
| | General flexibility or unspecified (2) | Flexibility that is not captured by the aforementioned codes | "I have some flexibility in my job. I've been there a long time, and the managers and staff trust that I have their best interests in mind and that I will complete projects." |

**Table 4** (continued)

| Parent code (*f*) | Sub-code (*f*) | Description | Example |
|---|---|---|---|
| Other Job Resources (73) | | This parent code reflects participants who stated that their employer provides them with resources that aid their work ability. This excludes support, job control, and flexibility, which are separate parent codes | |
| | Benefits (36) | Benefits that are important to work ability; e.g., health insurance, paid time off/vacation time, and an EAP | "My current employer offers paid time off and discounts at gyms so that I can stay in shape mentally and physically." |
| | Job modifications (12) | Employer modifies job or provide accommodations to help work ability | "After a particularly bad patch my employers also assigned me part-time assistants from other departments who were looking for extra hours. They are essentially on call and I can use them to make sure tasks are taken care of if they involve things likely to provoke my anxiety." |
| | Skills training or development (8) | The employer provides opportunities for training or development | "Yes, we have semi-annual training meetings. Vendors come in and keep us up to date with new technologies and current trends they are seeing. We also have weekly conference calls and webinars." |
| | Ergonomic work setups (6) | Equipment that is suited to the workers' needs | "Two years ago, all employees at my workplace were required to meet with an ergonomic consultant; as a result, I was allowed to get a new office chair and a footrest in order to work more comfortably." |
| | Equipment and tools (6) | This includes various tangible resources necessary to successfully work | "They make sure we have all the materials we need in the field to stay successful in demoing our products to increase sales." |
| | Caffeine (5) | Employer provides caffeinated beverages, which helps workers maintain work ability | "My employer provides us with free caffeine, in the form of tea, coffee and soda, which helps me maintain my current work ability." |

**Table 4** (continued)

| Parent code (*f*) | Sub-code (*f*) | Description | Example |
|---|---|---|---|
| Support (41) | | This parent code reflects participants who stated that their employer (or others) provide them with support that aids their work ability | |
| | Supervisor Support (29) | Supervisors providing workers socio-emotional, feedback-oriented, instrumental, and/or structural support to help work ability | "My boss is very understanding of the situation and he allows me to do what is necessary for my health." |
| | Coworkers (9) | Coworkers providing support that helps work ability | "…Also I have problems lifting sometimes due to a physical injury but it is never a problem because my coworkers understand and are more then happy to help." |
| | Other general support (3) | General support that is unspecified in terms of the source | "… So far, people at my place of employment are understanding and supportive |
| Job Control/Autonomy (29) | | This code is for participants who say that having control over their work (leeway, ability to do it as they wish, they can make decisions about how work is done, ability to take breaks as needed) is helpful for their work ability | "The fact that my employer trusts me to do my job well and therefore leaves me alone helps me concentrate during difficult times." |
| Manageable Work (14) | | This parent code reflects participants who stated that their employer provides them with a workload and/or a work environment that is manageable and/or low stress | "My job has a decent level of work/life balance, which allows me to stay grounded and sane." |
| Other (6) | | This code is used when a participant states something their employer does to help their work ability that doesn't fit any of the other categories, including effective communication (2), banning perfumes (1), having staff parties (1), becoming self-employed (1), and keeping up pressure (1) | "Constant communication via email and just day to day conversation." |

$N = 301$. $f$ = frequency of the parent- or sub-code. Each participant response could contain multiple parent and sub-codes. Parent codes are listed in order from most to least frequent within each question; sub-codes are also listed this way within each parent code

**Table 5** Question 4 what employers can do to help workers maintain their work ability: parent codes, sub-codes, frequencies, descriptions, and examples

| Parent code (*f*) | Sub-code (*f*) | Description | Example |
|---|---|---|---|
| Increase Job Resources (93) | | This parent code includes job resources that participants' employers could provide to aid their work ability (except for flexibility, which is in a separate parent code) | |
| | More Support (23) | Improve the amount or quality of support provided by managers or coworkers to improve work ability | "My supervisor could be a bit more understanding about what OCD actually is and more considerate toward the grieving process." |
| | Better Work Setup (16) | Provide a more accommodating, ergonomic, and/or comfortable work setup to improve work ability | "They could provide the prep openers with some seats to help with our backs and legs while we're working on something for very long." |
| | Training & Development (13) | Provide training and/or development opportunities to improve work ability | "They could provide more active guidance or a mentoring program for younger employees like myself." |
| | Job Modifications (12) | Make job changes to meet health needs or limitations to improve work ability | "The one thing that I can imagine my employer doing that might possibly help maintain or improve my work ability, would be to reduce my responsibilities with respect to customers and the public, so that I would not have to deal with them as much as I do now." |
| | Better Equipment (11) | Provide updated or missing supplies, equipment, or tools to do the job to improve work ability | "About the only thing that could help improve my work ability would be an updated computer and newer farm equipment. The farm equipment we use is really old and the computer is several years old with not enough memory." |
| | Better Management (9) | Supervisors providing better management (organization of work, scheduling work, and/or providing feedback) would improve work ability. This code excludes support, which is captured above | "Let us work a set schedule. We never know how many hours we have to work on any given day. Most of the time we don't even know if we will have the weekend off. They generally give us about 2–3 h of "advanced" notice (I'm not exaggerating either). It's hard to make plans when you have no idea what your schedule is going to be like." |
| | More Job Control (7) | Increase workers' control over work (i.e., leeway, autonomy) to help work ability | "They try to be helpful by giving me a helper. The helpers don't want to learn and do things wrong often. They in return get rude and stress me out more than ever. I would like if my bosses would let me do my thing and work alone and only send someone to help if I need help moving things or specifically request." |
| | Other (2) | Additional resources that would help work ability include providing coffee at work and providing transportation to work | "Just make sure that there is coffee on the premises of my job location at all times, if manageable, as the caffeine is something I very much need as a supplement for my work." |
| Nothing (71) | | This code reflects participants who said their current employer cannot do anything else to aid their work ability | "I have no suggestions for change in regards to what my employer can do to help me maintain my current work ability." |

**Table 5** (continued)

| Parent code (*f*) | Sub-code (*f*) | Description | Example |
|---|---|---|---|
| Provide Benefits (63) | | This parent code reflects participants who stated that their employer could give them more benefits to aid their work ability | |
| | Pay (20) | Paying workers more would improve their work ability | "My current employer doesn't really value their employees very much overall and frankly they kind of treat us as expendable and easily replaceable. If they would be willing to invest more time and money in me I would be more than willing and easily capable of improving my skill set and my overall value to the company." |
| | Health-Related (16) | Providing health-related benefits would help work ability (e.g., food, gym access, mental health resources). This excludes health insurance which is a separate code | "My current employer could offer healthier food options in the cafeteria as that would eliminate the need for me to bring my own healthy lunch into work." |
| | Time off (15) | Providing time off (or more time off) would improve work ability (either during the work day or full days off) | "An extra day off every few weeks would be helpful for mental and physical rest." |
| | Healthcare Coverage (6) | Employer-provided health insurance or more robust coverage would improve work ability | "If I had health insurance, I could possibly see someone about my bad back, which may in turn help me to work faster." |
| | Incentives (3) | Providing financial incentives would help work ability | "Maybe he could throw in some incentives like bonuses or something to look forward to and work efficiently." |
| | Childcare (3) | Providing childcare would help improve work ability | "Help to provide after school care for my children so I can continue to focus on my students if they need tutoring." |
| Provide Flexibility (62) | | This parent code reflects participants who stated that their employer could give them flexibility to aid their work ability | |
| | Flex-place (28) | Flexibility in location of work | "My employer does require me to drive into the office infrequently, and it is quite a long distance from home. They could require less of that to improve my work ability. I don't feel I'm needed to be physically present to perform my job duties." |
| | Flex-time (21) | Flexibility in scheduling work (work hours) | "Let me have a 24 h schedule so i can come into the lab when I'm at my best—at night." |
| | Breaks (13) | Providing breaks would help improve work ability | "Extra bathroom-specific break time could be very helpful, as bathroom time is included in our current break time and that does not give me enough time to properly destress." |

**Table 5** (continued)

| Parent code (*f*) | Sub-code (*f*) | Description | Example |
|---|---|---|---|
| Change Workload (37) | | This parent code reflects participants who stated that their employer changing aspects of their workload (e.g., reducing the amount or pace of work) and/or provide adequate staffing levels could aid their work ability | "Hiring one part-time assistant would help. I'm essentially doing the work of two people—I'm an executive assistant and also an office manager. Sometimes I feel like I'm wearing too many hats, but this is how companies have been running since the 1990s. You have to double up." |
| Other (8) | | This code used when a participant stated something that their employer could do to help their work ability that doesn't fit any other categories. (3) increase workforce diversity/sensitivity to diversity issues<br>(2) Reduce exposures to environmental factors; (2) add social events outside of work; (1) reduce "face time" | "Change air filters and reduce dust particles." |

$N = 301$. $f$ = frequency of the parent- or sub-code. Each participant response could contain multiple parent and sub-codes. Parent codes are listed in order from most to least frequent within each question; sub-codes are also listed this way within each parent code

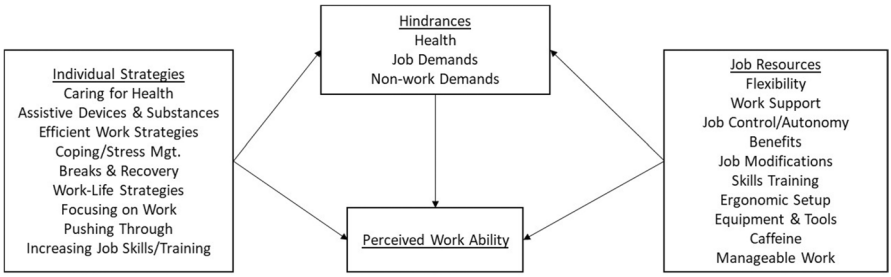


**Fig. 1** Conceptual model of perceived work ability: hindrances, individual strategies, and job resources

studies of PWA in these populations; flexibility in scheduling may also be a target for intervention to promote PWA.

Overall, our study findings about hindrances suggest that the JD-R model is an appropriate model for understanding PWA. Yet, we also found evidence for previously unexamined PWA hindrances, which warrant a need to expand theories of PWA. Many participants reported personal demands from family members (e.g., children, spouses/partners, dependent adults) as hindering PWA. Relationships between family and other life demands with PWA has received much less study; further, the JD-R model excludes *non-work demands*. In addition, and as noted, some participants reported hindrances that we construed as a lack of personal resources but have been omitted from prior studies, including financial issues, lack of/inconsistent childcare, and lack of/inconsistent transportation. Therefore, we recommend PWA researchers consider both non-work demands and a lack of personal resources beyond health and psychological characteristics in future studies.

Role conflict theory is helpful to understanding PWA as a function of family or other life demands or stressors. Kahn and colleagues defined role conflict as the "simultaneous occurrence of two or more sets of pressures such that compliance with one would make more difficult compliance with the other" (Kahn et al., 1964, p. 19). Further, pressure to perform one role may impede the performance of another role (Carlson et al., 2000; Greenhaus & Beutell, 1985; Matthews & Barnes-Farrell, 2010). Employees have finite amounts of time and energy to devote to both work and family roles, and when roles conflict, employees may feel less able to continue working in their current job. Role conflict is often integrated as a demand within the JD-R; yet, recognition of its depleting effects on PWA through work-family conflict is lacking. We recommend future research more explicitly integrate work-life issues when examining PWA.

Conservation of Resources (COR; Hobfoll, 1989) theory is another useful framework for understanding the role of resources (including personal resources), or lack thereof as related to job stress. According to COR, individuals try to obtain, retain, and protect the things they centrally value (i.e., resources; Hobfoll, 1989; Hobfoll et al., 2018). When individuals feel they have lost resources or their resources have been threatened, stress can occur. Further, loss spirals may occur, wherein loss of resources may beget further loss of resources (Hobfoll et al., 2018). For example, health declines or lack of financial resources to enable one to get to work may

precipitate PWA declines. PWA may be viewed as an important resource that allows one to continue working and reap the benefits of doing so (e.g., pay, social connection, sense of purpose). Resulting stress from spiraling threats to health, financial resources, and PWA may lead to strains, such as burnout, and possibly decisions to leave one's job. Future research may benefit from examining personal resources and PWA from a COR loss spiral perspective.

### Individual Strategies to Maintain Work Ability

Individual strategy-related parent codes, sub-codes, frequencies, descriptions, and example responses are in Table 3.

**Caring for Health/Self-Care** The most frequently reported strategies to maintain WA were those related to caring for health. These include: exercise (e.g., cardiovascular activity, strength training, and yoga), diet (e.g., consuming more healthy foods, and fewer less-nutritional foods and drinks), getting adequate sleep and practicing good sleep hygiene, resting, meditating, attending medical appointments, managing pain, and staying hydrated. Participants reported that by keeping themselves healthy, they could maintain their WA. For example, one participant reported, *"I am seeking medical support, I have completely changed my diet to maximize health and I have been doing stretching and working on regaining some of my strength (though I need to go slow…).*" We posit that caring for health indirectly affects PWA through reducing health-related PWA hindrances.

**Assistive Devices, Substances, and Medication** Whereas the prior strategies to improve health may indirectly affect WA through health improvements, we argue that using assistive devices, substances, and medication are focused on the *direct* goal of maintaining WA. In other words, these responses were about using devices and substances for the direct goal of being able to continue working, and not to improve one's health. Sub-codes include: medications (over the counter and prescribed), caffeine, and assistive devices (e.g., cane). For example, one participant stated, "*…I try to take ibuprofen before I begin each shift ….*" Another reported, "*I normally take an energy supplement when I get to work and I'll drink a second one midway through my shift*."

**Efficient Work Strategies** This parent code includes worker-initiated strategies related to working efficiently to maintain WA. Sub-codes include: scheduling work for optimal functioning, organizing work for optimal functioning, various "productivity hacks," pacing work carefully, and other strategies for working efficiently (e.g., delegating work). An example of scheduling is, *"…I make sure to carefully schedule things and build in extra time to my schedule so that I can…complete everything as required even if I get distracted or work somewhat slower than normal*." An example of organizing work is, "*I generally try to plan my work out by priority and do all the high-priority items at work as I can. I then try to finish the lower priority ones…"*

An example response coded as a productivity hack and pacing is, "*Things that I can do slowly or break into segments, I do so…rather than verify my receipts and do my reports and separation by payment type, I might separate the types first, verify that all receipts are present by type at another point, then verify at another point…*" These strategies may help PWA through effectively managing job demands.

**Coping/Stress Management Strategies** The next group of personal strategies are those related to coping with stress. Sub-codes include: maintaining a positive mindset/attitude; disengaging; breathing, meditation, and prayer; and getting social support. An example of maintaining a positive mindset is, "*…working in retail has it's challenges…from dealing with customers. I don't take their complaints personally and try to find them amusing without laughing at them…I focus on the many positive aspects of the job like my co-workers…and there are several customers I look forward to seeing…*" An example of disengaging is, "*I try not to think about work too much and just do enough to get by. Sometimes I drink alcohol to try to forget about work.*" Coping strategies may help improve stress and health, thus affecting PWA.

**Breaks and Recovery** This group of codes relates to taking breaks and/or finding ways to get away from work to maintain WA. Sub-codes include: taking active breaks (e.g., *"I try to move around whenever I can as that seems to help maintain my energy level. It gives me a little mental break too which helps focus my work*") and taking restful breaks (e.g., "*I take a power nap at lunch to refresh myself and boost cognitive function*"). Taking breaks may also improve stress and health, indirectly affecting PWA.

**Work-Life Strategies** The next set of strategies relate to work-life management. Sub-codes include: maintaining work-life boundaries, taking time off, having fun outside of work, using flexible work benefits, and using support from friends and family to help with work-life issues. An example of setting work-life boundaries is, "*I currently make sure that when I am at home that I do not do anything work related, such as checking email, making phone calls,* etc. *This way I am able to devote my full attention to my family when I am home, and then fully immerse into work when I am not*." An example of using time off is, "*Lately I have noticed that I have been taking a lot of vacation days…which helps a bit*." These strategies likely affect PWA through alleviating non-work demands hindrances.

**Focusing on Work** This code includes strategies related to staying engaged and focused at work—in general or on the task at hand—to maintain WA. An example is, "*I try to close my mind off from other thoughts and just consume myself in the work I'm doing.*" We consider this a direct strategy to promote WA.

**Nothing** The next most-frequent category of responses was from those who said they do not use any strategies to maintain their WA. For example, "*No strategies. I just work. It works out. I do my job well*."

**Keep Pushing Through** This parent code includes strategies related to 'powering through' work and/or 'toughing it out' to maintain WA. An example is, "*I just keep working through the pain since I know I need to pay the bills.*" Like focusing, we consider this another direct strategy to maintaining PWA.

**Job Skills and Training** This code includes ways to increase job skills and/or training and using job crafting to maintain WA. An example is, "*The most effective strategy I employ is going outside my work to…assimilate information and skills that would allow me to be more effective at my job. This may mean a simple program course, and obtaining learning materials…that would be more effective in the current duties…*" This strategy may help directly influence PWA; it may also serve to reduce demands to indirectly affect PWA.

**Discussion** Many participants in our study reported using personal strategies to help maintain their WA. Some strategies may be considered ways of increasing resources (e.g., caring for health, coping with stress, taking breaks, boosting job skills through training). As noted, we consider these *indirect strategies*, which serve to maintain WA through their effects on identified hindrances of health, job demands, and non-work demands. Other strategies focused on optimizing work functioning (e.g., using assistive devices, substances, and medication; efficient work strategies). We consider these *direct strategies* as they primarily serve to enhance WA and functioning directly, without enhancing resources or reducing demands.

The strategies described by participants for maintaining their PWA also align with theories of coping with stress. Coping is defined as adapting cognitive and behavioral efforts to manage stressors (Lazarus & Folkman, 1984). In their theory of stress and coping, Lazarus and Folkman (1987; Folkman & Lazarus, 1988) assert that individuals go through a cognitive appraisal process when faced with a stressor to determine whether they have the resources necessary to respond effectively to the challenge or change, and the resulting coping may be problem-focused or emotion-focused (Lazarus & Folkman, 1987). Stress management strategies, efficient work strategies, taking breaks and relaxing, and job skills training and development all represent problem-focused strategies of coping, such that they represent instrumental actions aimed at helping maintain WA. Other strategies participants described, such as trying to maintain a positive attitude, disengaging, and meditating, are examples of managing emotions in response to stressors, or emotion-focused coping.

The health theory of coping recognizes all coping strategies as adaptive and helpful for reducing stress in the short-term, but categorizes coping strategies as either healthy or unhealthy based on their likelihood of potential negative consequences to the individual and their overall health (Stallman, 2020). In terms of the strategies described by participants in the current study, exercising, eating healthfully, meditating and breath practices, seeking social support, and resting are examples of healthy coping strategies that may help participants cope in the short-term but are also beneficial (or at least not detrimental) for their long-term health. On the other hand, using energy drinks and other substances and "just powering through it" were described by some participants as strategies they use to maintain their work ability. These may

be effective for participants in the short-term, but may have longer-term negative consequences to their health and work-related wellbeing (Stallman, 2020).

In addition to the JD-R, other resource-based theories align with our findings regarding the use of personal strategies to maintain their PWA. As noted, the COR theory (Hobfoll, 1989) is helpful for understanding how personal strategies may help workers maintain their PWA. According to COR, when employees feel their personal resources have been depleted or threatened, they will try to increase resource levels and protect their current resources. Participants' reports of resting, stretching, taking work breaks, and using "productivity hacks" are examples of attempts to restore and foster their personal resources (e.g., energy, time). Also, COR proposes resource spirals, in which resources may beget resources (Hobfoll et al., 2018). For example, caring for one's health may lead to health benefits, leading to PWA improvements.

The Selection, Optimization, Compensation (SOC) framework (Baltes & Baltes, 1990) is also relevant to workers using personal strategies to maintain PWA. The SOC model is a resource-based theory of aging, which posits that workers with limited resources in demanding situations optimally allocate resources and compensate for lost resources to meet selected goals (Zacher et al., 2016). Some research has found evidence to support the notion that such strategies are reliant upon autonomy (Weigl et al., 2013). We recommend PWA researchers also consider the effects of autonomy and other job resources on PWA when examining personal strategies or implementing interventions to improve PWA for workers with chronic health conditions and/or work-life challenges. The COR and SOC models may be helpful in these efforts.

Although they are individually-initiated, our findings about personal strategies have important implications for organizations. For example, as mentioned, organizations should provide workers with autonomy so workers can enact the strategies listed under efficient work (e.g., schedule and organize work for optimal functioning, allow for optimal work pacing). Workers may also need flexibility and support for taking care of their health while at work (Gignac et al., 2014; McGonagle et al., 2020); flex-time and flex-place are helpful in this regard (Shifrin & Michel, 2021). We also add from our findings that organizations should offer workers buffers in their workdays to *allow for breaks as needed* to help with PWA.

### Ways that Employers Support Workers' Work Ability

Employer support-related parent codes, sub-codes, frequencies, descriptions, and example responses are in Table 4.

**Nothing** The most frequent response about employer-provided supports was that the employer does not provide anything to help the participant maintain their WA (e.g., "*My employer does not do anything to help me maintain my work ability. I'm expected to work to full capacity regardless of my personal issues*").

**Flexibility** The second most frequently cited helpful employer-provided support for WA was flexibility. This includes: flex-time (flexibility in timing of work), flex-place (flexibility in work location), and time off or breaks without penalty. This response is an example of both flex-time and flex-place: "*My employer is very understanding about my mental health. I couldn't work for a better employer. Sometimes he allows me to work after hours or from home…*" An example of employer-allowed time off is, "*If the pain becomes out of control the company will allow me to leave without punishment. I just lose hours*." We posit that flexibility has several pathways to promoting PWA, through enabling use of work-life strategies, alleviating non-work demands, enabling efficient work, and allowing workers to care for their health.

**Other Job Resources** This next most-frequent parent code reflects participants who stated their employer provides them with various job resources that aid their WA (excluding support, job control, and flexibility, which are separate parent codes). These include: benefits (e.g., health insurance, paid time off), job modifications or accommodations, skills training or development, ergonomic work setups, equipment and tools, and caffeine. For example, "*Good health benefits, gym on site, walking path outside office is used regularly and encouraged for walking meetings. All offices are spacious, comfortable, and have large windows*." Another participant reported that accommodations helped them maintain their WA, "*My schedule was changed to accommodate a stress related need/request*."

As displayed in Fig. 1, job resources may have direct effects on PWA, but also indirect effects on PWA through alleviating hindrances. For example, benefits promote health management and enable strategies to care for health. Job modifications directly support WA and also support health by allowing workers to avoid exposures. Skill development and training may promote WA directly and indirectly, through increasing resources and/or reducing job demands. Ergonomic work setups, equipment and tools, and caffeine directly promote WA; an ergonomic setup also may indirectly benefit WA through health promotion.

**Support** This parent code reflects participants who stated support aided their WA. Sub-codes include: supervisor support (e.g., "*My supervisor is great about assigning other people to help when my work load becomes overwhelming*"), coworker support ("*…I have problems lifting sometimes due to a physical injury but it is never a problem because my coworkers understand and are more than happy to help*"), and other general/unspecified support ("*…If I am having a really bad flare up day, my employer understands why I have to stay home…people at my place of employment are understanding and supportive*"). We posit that support has many paths to PWA promotion: through enabling health promotion activities, efficient work, work-life strategies, and job modifications, and reducing job demands.

**Job Control/Autonomy** Many participants said their employer providing them control over their work (e.g., leeway, ability to decide how they complete their work) was helpful for their WA. These responses exclude flex-time, flex-place, and flexible time off as noted in the parent code flexibility. An example is, "*They allow me*

*to do what I need to do without interference. They trust me and my judgement and it makes me feel at ease…*" Job control can help PWA through enabling participants to care for their health, use efficient work strategies, use work-life strategies, and reduce job demands.

**Manageable Work** This code reflects participants who stated their employer provides them with a workload and/or a work environment that is manageable, not too time-pressured, and/or low stress. An example is, "*My job has a decent level of work/life balance, which allows me to stay grounded and sane*." Manageable work may directly relate to PWA, or indirectly, through allowing resource allocation to health management or other beneficial activities to PWA.

**Other Employer-Provided Supports** These supports did not fit any of the other parent codes and include communicating effectively, banning perfumes in the office, having staff parties, and maintaining pressure on the worker to promote WA.

**Discussion** It was surprising that the most-frequent code was "nothing." Upon further investigation, it was apparent that there were many ways to understand this finding. First, it is notable that, of those whose responses were coded as "nothing" or "NA" to this question, only 22 participants (25%) of them also gave responses that were coded as "nothing" or "NA" for question 4 (what employers could do to help). It seems, therefore, that most of these respondents perceive their employer *could* help them maintain their WA but currently do not. In looking at participants' text responses, a few other points emerged. First, some participant responses suggested that their employers were not supporting them because their employer did not know about their WA hindrance. For example, one participant noted, "*I haven't ever told my employer about my headaches*." It could be that these participants did not want to reveal their WA hindrance (e.g., underlying health condition) to their employer, which may prevent their employer from directly supporting their WA. Second, some participants held general negative perceptions of their employers, which may explain their employers' lack of support. For example, one participant wrote that their employer was "*corrupt, selfish, terrible at managing people…*" Third, many participants projected discouragement in their responses when discussing their employer's lack of support. One participant wrote, "*Not really. No one seems to understand how hard it is to perform my job when I feel the way I do daily*." This suggests employers may not fully understand or empathize with the extent of participants' struggles.

Again, our findings regarding employer supports align with the JD-R model; participants reported job resources, including support, job control, flexibility, benefits, training, ergonomic work setups, and equipment, as being important to maintaining WA. Of the various ways that employers support workers, *flexibility* was the most commonly reported. Flexibility allows workers to "self-accommodate" and attend to their health while meeting demands from their various work and family roles. Flex-time and flex-place were the most commonly reported types of flexibility in this study, which aligns with the most common forms in the literature (Shifrin & Michel, 2021). However, an important addition from our study is *allowing for flexible breaks during the workday*.

We suggest that, for jobs in which flex-time and flex-place are not possible, as with some blue-collar and service positions, managers should allow workers to take active and/or restful breaks when needed during the day to help them optimize their WA. Separately, several participants also listed job control and support as important to their WA. These findings have important implications for intervention to increase autonomy and support, which we discuss after reporting findings for question 4 in the next section.

Throughout this section, we note the various pathways through which each of these supports may affect PWA. Some directly influence PWA, and others indirectly influence PWA through reducing demands and enabling use of various strategies to promote health and manage work and life demands. Notably, job control, flexibility, and support have several paths to promoting PWA, and therefore should be prioritized for large-scale intervention.

### What Employers Can Do to Help Workers Maintain or Improve Their Work Ability

Parent codes, sub-codes, frequencies, descriptions, and example responses for this question are in Table 4. All codes that emerged for this question were also captured in responses to the previous question (3); therefore, we do not re-state their conceptual paths to WA.

**Increase Job Resources** This parent code includes job resources participants' employers could provide to aid their WA (except for flexibility, which is in a separate parent code). Sub-codes include: provide more support (better quality or quantity of support from managers or coworkers); provide a more comfortable or ergonomic work setup; provide more training and/or development opportunities; provide job modifications or accommodations; provide updated or missing equipment, supplies, or tools; provide better management (organization of work, scheduling work, and/or providing feedback); and provide more job control. For example, one participant said, "*Encourage me more. She…hardly ever praises good work that I have done*." Another said, "*…what they could do is put some better ventilation in the kitchen…if it was better ventilated it likely wouldn't feel like 100 degrees*."

**Nothing** The second most-frequent response was nothing, e.g., "*I have no suggestions for change in regards to what my employer can do to help me maintain my current work ability*."

**Provide Benefits** Several participants stated that having benefits would help their WA. These include: increased pay, more health-related benefits (e.g., gym access, healthy food options, and mental health resources), time off, healthcare coverage (employer-provided health insurance), financial incentives (bonuses), and childcare benefits. For example, "*…She could offer a way for us therapists to do yoga, meditate, or find some other relaxation outlet*."

**Provide Flexibility** Several participants said their employers could provide flexibility to aid their WA. Sub-codes include: flex-place, flex-time, and breaks. For example,

"*What would be most helpful for me would be… 1) Allowing greater flexibility in my work schedule, including switching weekday work for weekend work (most of my work…I could conceivably do whenever). 2) Greater opportunities to work remotely. When one or both of my kids get sick, someone has to stay home with them…*" Another example is, "*…My employer could offer more mini-breaks in the work day so I could gather myself often*."

**Change Workload** This code reflects participants who stated their employer changing aspects of their workload (e.g., reducing the amount or pace of work) and/or providing adequate staffing levels could aid their WA. For example, "*Think about how much work we're expected to do and either give us more time to do the work, or give us only the amount of work necessary to do our job in the time we're given*."

**Other** Other ways participants reported employers could help them maintain their WA include: increasing sensitivity to diversity-related issues at work, reducing exposures to hazardous environmental factors, adding social events outside of work, and reducing face time requirements at work.

**Discussion** Participants reported their employing organizations or supervisors could increase various job resources, including support, flexibility, ergonomic work setups, training and development, equipment, job control, and benefits, to help maintain or support their WA. Additionally, some participants reported a change in workload would help their WA, which is consistent with reducing job demands. Although some noted decreasing demands would help, it is notable that the majority of participants reported *increasing resources* in response to both questions 3 and 4, versus *reducing demands*. Of course, increasing resources can help reduce demands as well.

In addition to the JD-R model, our results in this section are consistent with Siegrist's (1996) effort-reward imbalance (ERI) model, which posits that when an employee's efforts are met with insufficient rewards (an imbalance between effort and reward), they will experience stress and reduced health, even more so than if they experienced high effort or low reward independently. Therefore, by changing aspects of work that reduce employees' workload or that increase resources and rewards, employers may prevent over-commitment and related declines in health and well-being. Most participant responses from questions 3 and 4 are about increasing resources (job control, flexibility, support, training and development) and rewards (e.g., pay and health insurance), and providing manageable workloads, which align with the ERI model. PWA researchers consider potential imbalances as described by the ERI model when studying PWA.

## General Discussion

Taken together, our findings provide insight into the various hindrances workers perceive as affecting their WA and various supports to help their WA, both individually and from the employing organization. We found support for using the JD-R model,

yet also found important omissions from the current literature, suggest additional theories, and provide a conceptual model of our findings, which include direct and indirect predictors of PWA.

### Implications for Theory

First, we found that *non-work demands* are important predictors of PWA and, relatedly, *strategies to manage work and non-work demands* are important for maintaining PWA for many workers. Non-work demands are largely omitted from the JD-R model; researchers may consider using role conflict theory and COR theory to integrate family and other personal life demands and threats to resource loss when examining PWA. Second, because many of the individual strategies that participants reported as being critical to maintaining their WA are contingent upon available job resources, and the majority of participants directly mentioned them as helpful, we also propose that *employers should place a priority on promoting job control, flexibility, and support* for workers to help them maintain PWA in the face of hindrances. Researchers focusing on individual strategies may find the SOC model helpful in doing so (see Weigl et al., 2013). Third, we note that the ERI model may be helpful in conceptualizing factors that affect PWA.

We observed an interesting trend in the responses to questions 3 and 4: many participants listed motivational factors as being helpful to their WA. This begs the question of whether WA is solely an *ability* (akin to cognitive ability or other "can-do" factors) or a motivation (a "will-do" factor). Brady et al.'s (2020) definition of WA is simply, "an individual's ability to continue working in their job" (p. 639). Considering this in light of participants' responses to this study and JD-R's propositions around dual pathways (i.e., health impairment/depletion on one hand, energizing effects/motivation on the other), we believe it is important to make this distinction. We recommend PWA researchers consider motivation to continue working separately from PWA. Relatedly, a unique contribution of this paper is that distinguish direct paths from some resources to PWA (e.g., assistive devices and substances, strategies to focus on work, equipment) that are not via motivational pathways of the JD-R (reducing demands or increasing resources to indirectly affect PWA).

### Implications for Practice

As noted, PWA is related to worker well-being, as well as employment outcomes including turnover intentions and turnover, disability leave, absence, and early retirement (Ahlstrom et al., 2010; McGonagle et al., 2015; Sell et al., 2009; von Bonsdorff et al., 2011). Therefore, developing *evidence-based interventions* to improve PWA is critical to efforts toward well-being promotion and workforce retention. Our study provides several points of intervention to help improve PWA.

In a review of the WA literature, Cadiz et al. (2019) categorize interventions into those at the individual, group, and organization levels. Individual interventions to promote WA are targeted toward individuals and include one-on-one activities such as coaching or mentoring. Individual interventions include those aimed at improving

health behaviors (e.g., physical activity, Flannery et al., 2012; Ohta et al., 2015; Pohjonen & Ranta, 2001), coping with stress (Sahlin et al., 2014; Wu et al., 2006), and improving personal resources (McGonagle et al., 2014). Our findings suggest individual interventions should focus on improving health, reducing job demands, and helping manage non-work demands. Work-life intervention researchers may consider PWA as an important outcome, as our findings suggest this is an understudied, yet important predictor of PWA.

An important caveat to individual interventions is they are likely less effective when implemented in the absence of group and organizational level changes (Gilbert et al., 2018). Any individual-level interventions from organizations should be accompanied by an audit of work design and work environment factors that may be necessary for employees to effectively implement individual strategies (e.g., autonomy or flexibility may be needed to help workers optimize their time toward work depending on health or family-related needs).

Group- and organization-level interventions are targeted toward groups of employees and include group-based trainings and changes to the structure of work or the organization. For example, Müller et al. (2016) tested a group training on SOC strategies; Vuori et al. (2012) found success with a career preparedness training intervention; Von Thiele Schwarz et al. (2008) found evidence of improved PWA with reduced work hours; and Ahlstrom et al. (2013) found support for a supportive work environment intervention. Our findings suggest that organizations would find the most leverage for improving workers' WA through increasing *autonomy, support, and flexibility* for workers.

Our findings made it clear that managers play a critical role in terms of support; they may provide socio-emotional support through attempting to understand employees' needs and using their latitude to provide resources that would help employees' WA, such as offering flex-time or flex-place options, promoting autonomous prioritization of tasks, or requesting ergonomic equipment. We see supervisor training as being an important addition to existing organizational interventions. Such training could include: educating supervisors on the concept of WA, various common hindrances to WA, and how to assist workers to maintain WA; how to react when an employee discloses a hindrance to WA; and what resources are available to the affected employee. One example of a supervisor training that may be helpful (but did not include WA as an outcome) is the mental health awareness training from Dimoff and Kelloway (2019).

## Limitations

As with any research method, our qualitative method has some limitations. The inductive way these data were used to develop codes allowed for the emergence of unanticipated findings. However, without imposing a top-down structure on the data, there was some overlap between the codes. This required us to make subjective decisions about how to code data, which were prone to personal biases. To mitigate these concerns, we strived for consistent coding by using multiple coders for each response and by frequently meeting to resolve disagreements to calibrate our coding

approaches. We also estimated Cohen's kappa coefficients, which supported consistencies in rater agreement.

Additionally, the frequencies reported in this study were dependent on our specific sample of workers who reported having hindrances to their PWA. It is important to note that participants in this study were all currently working, which restricts the range of PWA experiences to those who have relatively high levels of WA (as those with lower levels of WA are more likely to leave the workforce). Future studies may consider including participants who have left work on disability to get a broader range of perspectives.

We conducted this study in summer of 2018, before the COVID-19 pandemic started. The experiences participants reported, therefore, reflect a pre-pandemic world. However, work has changed for many due to the pandemic. For example, many white-collar workers were given the opportunity to work from home during the pandemic. This additional flexibility may have improved their WA; it may, alternatively have brought up additional issues, such as an inability to set boundaries between work and non-work life and exhaustion from having to be on video for interactions (Bennett et al., 2021). Blue-collar and service workers largely did not benefit from flexible policies during COVID and may have experienced additional stressors and hindrances to their WA. Workers of all types with chronic health conditions and who are immunocompromised likely experienced new work stressors that affected their WA.

We used MTurk to recruit our participants, which is somewhat controversial, and much has been written about its use. A first criticism of MTurk samples for research studies relates to sample characteristics (e.g., Walter et al., 2019). Is the sample representative of the population to we wish to generalize? Research shows that U.S. MTurk samples appear to be representative of the U.S. population in general in terms of gender and age (Roulin, 2015), as well as personality characteristics and cognitive ability (Paolacci & Chandler, 2014) and symptoms of psychopathology (McCredie & Morey, 2019). Another concern about using MTurk samples in research is participants' motivation to respond, and whether MTurk participants are who they claim to be (McGonagle, 2015). For this reason, we used existing MTurk qualifications to pre-screen individuals for our inclusion criteria (currently living in the U.S. and employment status of full-time 35 + hours per week). We additionally specified that the approval rate for participants must be greater than 98%. We did not use Master workers, yet one study found no differences in data quality between an MTurk master sample and an MTurk non-master sample (Rouse, 2020).

Another concern about the use of MTurk data relates to data quality. MTurk participants have been found to provide good test–retest consistency to demographic questions (Mason & Suri, 2012) and self-report measures (Buhrmester et al., 2011; Holden et al., 2013; Shapiro et al., 2013). Because we used open-ended questions in this study, we did not assess reliability; yet all participants who were retained in the final sample submitted coherent responses that were relevant to the questions posed. Also related to data quality, some may question whether MTurk participants tend to be more careless in responding to survey items than other samples. Some studies have found that MTurk participants show similar levels of attentiveness as non-MTurk participants (e.g., Berinsky et al., 2014; McCredie & Morey, 2019; Paolacci

et al., 2010). We included measures of inattentive responding on our survey and removed those demonstrating inattentive responding.

Finally, this study included workers in the U.S. only. There are likely cultural contextual issues specific to the U.S. that limit generalizability to other cultures. Particularly, having health insurance largely tied to employment means those who are most vulnerable in terms of WA—those with chronic health conditions, those with childcare or elder care needs or sick family member – are those who also need to remain employed. Future research should investigate these ideas in varying cultural contexts.

## Conclusion

This study extends previous research on PWA by using a qualitative approach to identify common hindrances to WA, individual strategies to maintain WA, and employer-provided supports for maintaining WA. Our findings align with existing research on PWA, including the appropriateness of the JD-R model to examine PWA, and job resources, job demands, and personal resources being important to PWA. Not surprisingly, we found health to be the most common WA hindrance; we therefore suggest that WA researchers study workers with CHCs. Our findings also provide insights into under-examined WA hindrances, including non-work demands, such as family obligations and lack of financial resources. As the JD-R model largely excludes non-work demands, we recommend researchers examine these demands as related to WA and consider workers with non-work demands to be vulnerable to WA declines. We also uncovered several personal strategies to help maintain WA (e.g., maintaining health and using work strategies to optimize functionality) that are dependent upon available job resources (autonomy and flexibility). Ultimately, job resources of support, job control, and flexibility emerged as the most powerful leverage points for organizations to help workers maintain WA. In terms of theory, we suggest separating the motivation to continue work from the ability to continue working (WA). We also provide initial support for categorizing strategies and resources as direct (e.g., assistive devices) and/or indirect (work-life strategies) predictors of PWA.

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**Declarations**

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