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Vitality, Health, and Work

The older person's vitality sources

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Förord

Denna process har varit en intressant och lärorik resa och jag har många att tacka som varit med mig på vägen.

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Tina Söderbacka

Abstract

Tina Söderbacka, 2022: Vitality, health, and work - The older person's vitality sources. Supervisors: Professor Lisbeth Fagerström, PhD, Åbo Akademi University; Linda Nyholm, PhD, Associate professor, Åbo Akademi University.

Aim: The present thesis aims to gain a new understanding of the vitality of older persons in general and in working life, and to contribute to a new understanding of what is giving vitality to older workers to continue working, and how their vitality can be supported.

Methods: A hermeneutic approach was used to interconnect and summarize the results in the summary of the thesis. In the first sub-study, 2579 responses to the two open-ended questions about vitality were analysed. A comprehensive questionnaire was sent to 4927 older persons aged 65 and 75, in Finland and Sweden. In the second sub-study, a qualitative interview study was conducted. All participants were working in the health care sector and a total of 15 people aged 59–65 participated in the study. When summarizing the first and second sub-studies qualitative content analysis was used. A scoping review was used in the third sub-study. The study focused on academic articles published between 2007 and 2019, aiming to answer the following questions: 1) What kind of interventions have been made to support older employees' health? and 2) What effects do these interventions have on older employees' work ability? A total of 8 articles were found that met the inclusion and exclusion criteria. The overall average age of the participants was 50-55.

Results: In the first sub-study, a safe and confirming communion, meaningful activities, an optimal state of health, and inner strength were important sources of vitality. Happenings in the world and in one's close environment that threaten inner meaningfulness, mental burdens that give rise to a feeling of hopelessness or depression, and ageing which includes illness or a restrictive life all decrease vitality. The second sub-study of older workers' plans to continue working, depends on both internal and external resources. Internal health resources that affect vitality are opportunities to use knowledge and skills, personal values and own health. External health resources that promote vitality are meaningful work, relationships and work community, working conditions, and benefits. In sub-study three it was found that positive behavioural changes and lowered health risks can be achieved through health counselling, which increases work ability. Measurements and screenings are good ways to chart and follow up on employees' work ability and health status. Supervisor training and support from

supervisors were seen to have a positive effect on health outcomes and increased work ability.

Conclusions: In this thesis, meaningful work is identified as a factor that gives vitality to the older worker and is therefore likely to prolong the working career. Meaningful activities are also a source of vitality for 65-and 75- year-olds. The results highlight the importance of considering the factors that strengthen vitality for the older persons at work and in general life and thereby promote their health and prolong working life. Lack of health care staff is a growing problem. The latest trend is to increase the retirement age in almost all professions. To achieve the goals, actions that promote work ability are needed. Employers should focus on employees' health, and on interventions that support older employees' work ability. Occupational health and other healthcare personnel can strengthen older persons' vitality during the ageing process.

Keywords: vitality, older worker, health intervention, work ability, qualitative approaches, interventions, scoping review, health sciences, caring science, occupational health

Abstrakt

Tina Söderbacka, 2022: Livskraft, hälsa och arbete- Äldre personers livskraftkällor. Handledare: Professor Lisbeth Fagerström, PhD, Åbo Akademi, Äldre universitetslektor Linda Nyholm, PhD, Åbo Akademi.

Syfte: Denna doktorsavhandlings syfte är att få en ny förståelse om äldre personers livskraft generellt och i arbetslivet och att utforska vad som ger den äldre arbetstagaren livskraft att fortsätta arbeta och hur deras livskraft kan stödjas.

Metoder: Ett hermeneutiskt tillvägagångssätt användes för att sammanföra och sammanfatta resultaten i resultatdelen. I den första delstudien analyserades 2579 svar på två öppna frågor om livskraft. Ett omfattande frågeformulär skickades till 4927 äldre personer i åldrarna 65 och 75 i Finland och Sverige. Den andra delstudien genomfördes som en kvalitativ intervjustudie. Alla deltagare arbetade inom hälso-och sjukvården och totalt 15 personer i åldern 59 - 65 år deltog i studien. Vid analysen av de första och andra delstudierna användes kvalitativ innehållsanalys. Scoping review användes som metod i den tredje delstudien. Studien fokuserade på vetenskapliga artiklar publicerade 2007 - 2019, i syfte att svara på följande frågor: 1) Vilken typ av interventioner har gjorts för att stödja äldre arbetstagares hälsa? 2) Vilka effekter har dessa interventioner på äldre arbetstagares arbetsförmåga? Totalt hittades 8 artiklar som uppfyllde inklusions- och exklusionskriterierna. De flesta deltagarna var mellan 50 - 55 år.

Resultat: I den första delstudien framkom att en trygg och bekräftande gemenskap, meningsfulla aktiviteter, ett optimalt hälsotillstånd och inre styrka är viktiga källor till livskraft. Det som hämmar livskraften är händelser i världen och i ens närmiljö som hotar inre meningsfullhet. Även psykiska bördor som ger upphov till känsla av hopplöshet eller depression och åldrande som inkluderar sjukdom eller ett begränsat liv minskar livskraften. Den andra delstudien om vad som ger äldre arbetstagares livskraft att fortsätta arbeta är beroende av både inre och yttre hälsoresurser. Inre hälsoresurser som främjar livskraft är upplevelsen av att få använda sina kunskaper och färdigheter, personliga värderingar och det egna hälsotillståndet. Yttre hälsoresurser som främjar livskraft är ett meningsfullt arbete, relationer och arbetsgemenskap, arbetsmiljö samt förmåner. I den tredje delstudien framkom att positiva beteendeförändringar och färre hälsorisker kan uppnås genom hälsorådgivning, vilket höjer arbetsförmågan. Mätningar och screening är ett bra sätt att kartlägga och följa upp arbetstagarnas arbetsförmåga och hälsotillstånd.

Ledarskapsutbildning och stöd från förmän påvisade positiv effekt på arbetstagarnas hälsa och arbetsförmåga.

Slutsatser: I denna avhandling identifieras ett meningsfullt arbete som en faktor som ger livskraft för den äldre arbetstagaren och ett meningsfullt arbete kan således ge en förlängd arbetskarriär. Meningsfulla aktiviteter är också en källa till livskraft för 65- och 75 - åringar. Resultaten lyfter fram betydelsen av att beakta de faktorer som stärker livskraften för den äldre människan i arbetet och i livet generellt och som främjar deras hälsa och därmed förlänger arbetslivet. Brist på vårdpersonal är ett växande problem. Den senaste trenden är att höja pensionsåldern inom nästan alla yrkeskårer. För att nå målen behövs åtgärder som främjar arbetsförmågan. Arbetsgivare bör fokusera på de anställdas hälsa och på interventioner som stöder äldre arbetstagares arbetsförmåga. Insatser från företagshälsovård och övrig hälso-och sjukvårdspersonal kan stärka äldres livskraft under åldrande processen.

Nyckelord: livskraft, äldre arbetstagare, hälsointervention, arbetsförmåga, kvalitativa förhållningssätt, interventioner, scoping review, hälsovetenskap, vårdvetenskap, företagshälsovård

List of original publications

Article 1.

Söderbacka, T., Nyström, L., & Fagerström, L. (2017). Older persons' experiences of what influences their vitality–a study of 65-and 75-year-olds in Finland and Sweden. *Scandinavian Journal of Caring Sciences*, *31*(2), 378-387.

Article 2.

Söderbacka, T., Nyholm, L., & Fagerström, L. (2022). What is giving vitality to continue at work? A qualitative study of older health professionals' vitality sources. *Scandinavian Journal of Caring Sciences*, *36*(3), 699-705.

Article 3.

Söderbacka, T., Nyholm, L., & Fagerström, L. (2020). Workplace interventions that support older employees' health and work ability-a scoping review. *BMC Health Services Research*, *20*(1), 1-9.

Abbreviations

GERDA Gerontological Regional Database

HR Human Resource

OHS Occupational Health Services

WAI Work Ability Index

WHO World Health Organization

Table of contents

1. Introduction

The goal in many countries is to raise the retirement age due to the shortage of staff in many areas constantly increasing, while life expectancy also increases. Therefore, there is a need for knowledge on how to support older workers to continue their working life. Between the years 2010 and 2030, the number of older workers is set to increase in the EU. In the year 2019, the employment rate of people between 55-64 years was 60% in the EU (Kannisto, Finnish Centre for Pensions, 2021). Thus, the average age of the labour force becomes higher. Workers' worsened work ability and early retirement results in high costs for employers and states and result in insufficient labour force figures (Finnish Centre for Pensions, 2020).

In most EU countries the official retirement age is 65 years (Finnish Centre for Pensions, 2021). In many countries, the retirement age is being linked to life expectancy. Most EU countries have a goal to raise the general retirement age and prevent early retirement from working life. To guarantee an adequate labour force in the future, there is an immediate need to prolong current working careers. Impaired working ability and disability pension (pension that is granted if one's work ability has been reduced for at least one year because of an illness, an injury, or a handicap) constitute large expenses for society. In addition, a worsened work ability affects human well-being and welfare, because of the suffering caused by illness and diseases. This also results in reduced income. In Finland, the leading cause (33%) of disability retirement is mental and behavioural disorders. These factors have been the leading cause since the year 2000. The second most common cause (32%) of disability pension is musculoskeletal diseases (Finnish Centre for Pensions, 2022). In Finland, the retirement age has risen because of the pension reform (2017) and there has also been a decrease in the number of disability pensions. Finns retired on an earnings-related pension half a year later in 2021 than in 2020 (Finnish Centre for Pensions, 2022). To guarantee the workforce, even in the future, workers need to continue working life for many more years.

The rising age of the population alongside a shortage of manpower in health care is a growing problem. Simultaneously, care staff are also aging. According to the WHO (2022), around 40 million new jobs in health care will be needed by 2030, and even with this growth, there will be a shortage of 18 million people in health care to achieve the UN's global goals for sustainable development, especially in the low-income sector and lower-middle-income countries (World Health Organization. Health Workforce – Data and statistics, 2022). In Finland, there is

already a shortage of staff, and it will be a challenge to have enough labour in the healthcare sector in the future. The sector needs to be more attractive and working conditions need to be improved (Tevameri, 2021).

To reduce the labour shortage problem many pension reforms have been made to extend working lives linked to life expectancy. Although there have been positive changes, there is a need to focus on the working ability of older workers and how they can continue to work until retirement age, and perhaps even after retirement age. By law, in Finland, there is a service that is offered by occupational health (Työterveyshuoltolaki, Finlex 1383/2001) to promote workers' work ability and function. There is a long tradition behind occupational health care in Finland, and the first law that prescribed this service was confirmed in 1978 and updated in 2001 (Ilmarinen, 2005).

The purpose of the law is that the employer, the employees, and the occupational health care together promote the following:

1) the prevention of work-related illnesses, diseases and accidents.

2) the health and safety of the work and the working environment.

3) the health, ability to work and functional capacity of employees at the different stages of their working careers; and

4) the functioning of the workplace community.

(Finlex/Ministry of Social Affairs and Health).

The Institute for Occupational Hygiene has conducted extensive research on the working ability of aging workers. According to Ilmarinen (2006), work ability is a balancing act between personal resources and work, while family and relatives also affect the balance. Healthy living habits and interests strengthen health and work ability.

Despite supporting activities from employers, the state, etc., older workers may feel that energy levels and vitality are decreasing with age due to different reasons. What is still relatively unexplored, however, is what gives the older worker the strength to continue in working life. Work is fundamental to human life and health, and work has an important meaning for health (Wärnå-Furu & Nyström, 2014). Human vitality is independent of age. There are sources within the human environment that provide vitality, and these sources of vitality then

become a health resource for humans (Fagerström, 2012). Vitality gives humans strength, even when life contains suffering.

This thesis is done from a caring science perspective. The theory of caritative caring was the starting point for this research and is found in the core concepts of health and vitality. An interesting question is, what could strengthen and weaken the older person's vitality and what health resources may be of importance for maintaining work ability, health, and vitality? Research on health effects in work from a health-promotion perspective has increased in the health science disciplines in the last decade, but there are still relatively few studies in health sciences that have studied vitality as a health resource among older people and older workers. In this thesis, the concept of vitality is defined/described as 'life energy', and 'inner health resource' and is the essence of health (Fagerström, 2012).

The present thesis aims to reach a new understanding of the vitality of older persons in general and in working life, what is giving vitality to older workers to continue working, and how their vitality can be supported. The thesis intends to enrich the applied clinical research in caring science. By clarifying what supports the vitality of the older persons, the older worker can receive support on an individual level, while the knowledge can benefit employers and society. The first part of the thesis presents previous research, theoretical perspective and aim. The second part describes the methodology and materials. The third part consists of results and a discussion about the new knowledge. The thesis consists of three published articles. The first article describes what positively and negatively affects the vitality of older persons (65- and 75-year-olds). The second article describes what can be sources of vitality for the older worker (> 60 years) in the care context. The third article clarifies the interventions that have already been made in the workplace to support older workers.

2. Literature review

A database search on vitality and older workers was initiated in connection with the first sub-study. Since then, the search has been done several times between 2016-2021. The research overview is limited to the years 2006-2022 (Academic Search Premier: CINAHL, PubMed, Medline, SAGES journal online and Taylor & Francis online). The use of ÅAU Library e-resources (e-articles, e-books, databases etc) included search engine NELLI (2016–2017), Finna (2018–2020) and Alma 2021. This includes searches in national and international databases as well as manual searches in bibliographies etc. The keywords were vitality, health, work ability, older worker, intervention, and occupational health. The results of the database search are summarized below under two main themes: health, age and work ability, and the role of occupational health care and management for older employees.

2.1 Health, age and work ability

When focusing on the working capacity of older workers, the focus is usually on people over the age of 55. In EU countries, an aging worker has been defined as 55-64 years old (Ilmarinen, 2005). Work ability has been presented as a work ability house (Ilmarinen, 2009; Finnish Institute of Occupational Health). Ilmarinen (2009) describes the work ability as a house with four floors (See Figure 1). The ground floor of the house consists of a person's health and the ability to function, which is the basis for work ability. The second floor consists of professional competence, knowledge and skills. The third floor consists of values, attitudes, and motivation, and the fourth floor contains the work environment and working conditions, the work community, and management. The managerial work and leadership skills are a central part of the fourth floor and have the strongest effect on work ability (Ilmarinen, 2019). The individual's work ability is also affected by occupational health care, family relatives and friends (Ilmarinen, 2009).

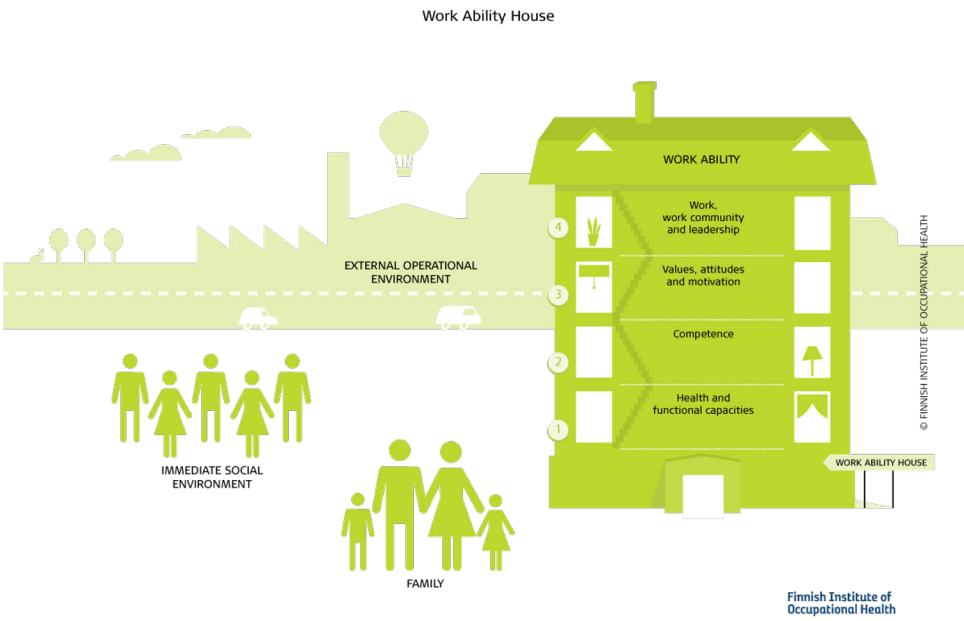

Figure 1. The work ability house © Finnish Institute of Occupational Health

The individual's work ability is a mix of personal resources, which can be described as, health and functional abilities (physical, mental, social), education, skills, values, attitudes, and motivation. Work ability is also defined as the balance between work and the individual's resources (Ilmarinen, 2012, 2019). Work ability is the result when individual factors are met concerning work requirements (physical and mental), the work community and the organization and the work environment (Ilmarinen, 2001, Ilmarinen & Vainio, 2012). The work ability can be evaluated e.g., via the Work Ability Index, WAI, which was developed in Finland in the early 1980s by researchers from the Institute of Occupational Health (Ilmarinen, 2009).

According to Dufva (2012), retirement is an individual stepwise process. The choice to continue working over the age of 63 only happens when there is e.g., good health, professional knowledge, challenging work, a supportive work atmosphere and good leadership (Dufva, 2012). Working after retirement is usually continued because work gives meaning to life and social contacts, which maintains health for older workers (Nemoto et al., 2020).

After the age of 50, many mental and physical changes often occur. Muscle strength decreases between the ages of 40 - 65 years and at 65 the average

muscle strength decrease is 10-25% from its maximum, although exercise gives individual variations (Crawford et al., 2010). Ilmarinen (2012) states that already from the age of 30, the capacity of the heart and lungs decreases, as well as muscle strength which weakens about 1-2% a year. The most reported problems among older workers are impaired energy and muscle function, difficulty concentrating and memory difficulties. However, support from colleagues and supervisors as well as strong informal relationships are perceived as positive. Work ability can also be increased by setting personal goals for employees (Koolhaas et al., 2010). According to Koolhaas et al. (2012), 60-year-olds have better mental health compared to workers aged 45-59 years, and those who work between 60-64 years are a healthy group of people (Koolhaas et al., 2012). Work ability has the greatest significance for pension plans and the willingness to continue working for both men and women (Thorsen et al., 2013).

Economic benefits, interesting work tasks, and flexible working hours encourage people to continue working (Takala et al., 2015). Social relationships and support can increase the return to work after long-term sick leave and this increase work ability (Englund et al., 2016). Low social support at work and in one's private life is associated with depressive and anxiety disorders and sleep problems. Low social support from supervisors and colleagues and a poor team climate are associated with future antidepressant medication use. Lack of supervisors' support even increases the risk of receiving a disability pension (Sinokki, 2011). Work is beneficial for physical and mental health and unemployment is associated with worsened physical and mental health and poorer well-being (Waddell & Burton, 2006).

The workforce in health care is aging and workforce shortage is a growing problem in health care in the European Region (WHO, 2022). Andersen et al. (2020) state that physically demanding work is a risk factor for disability pension among older female workers in elderly care. To decrease the workload among older workers, work requirements should be reduced according to physical capacity (Savinainen, 2004). Older workers with heavy physical tasks, like nurses, have a greater decrease in WAI than older workers with lighter physical work, for instance, physicians (Garzaro, et al., 2022). However, emotional challenges in the care profession can have positive effects on motivation and well-being (Donoso et al., 2015). In Finland, like in many other countries, the COVID- 19 pandemic has affected the personnel in the healthcare sector, and the demands in the field will continue (Tevameri, 2021). Human

Resources HR strategies need to be more proactive to retain workers in the health sector and maintain their ability and motivation (Jonsson et al., 2020).

2.2 The role of occupational health care and management for older employees

Low physical activity correlates with an increased risk of early retirement and, therefore, physical activity in workplaces should be promoted (Pulakka et al., 2019). Employers can do a lot to maintain and support health in working life (Koolhaas, 2014). According to Kuoppala et al. (2008), health prevention measures are valuable for employees' well-being and work ability, and health-promoting interventions in the workplace can improve work ability (Oakman et al., 2018).

The occupational health services (OHS) system is preventive health care that the employer must arrange by law (Ministry of social affairs and health in Finland). Health reviews, tests and counselling are experienced positively among 55–65-year-old workers. In occupational health care, the work tasks are considered in the surveys. Those who receive support from occupational health care, among other things via counselling, have a higher work ability index and retire later (Cloosterman et al., 2015). Health-promoting interventions are needed to support older workers' work ability and improve their working conditions (Oksanen & Virtanen, 2012). Also, Crawford et al. (2010) state that occupational health care can reduce the risk of early retirement. Preventive measures such as healthy eating, exercise, and supportive work measures (social support and stress prevention activities) have a positive effect on the health of workers. Dissatisfaction with well-being and working life increases the risk of workers receiving disability pensions (Harkonmäki et al., 2009). The knowledge and expertise that older workers possess deserve attention from the organization to be maintained through appreciation and training (Vasconcelos, 2018).

The management's ability to support employees also affects the staff's work ability. Through discussions about the work environment, barriers to progress and career opportunities, management and employees can make a personal plan for the employee together, and thus work ability can be strengthened and sick leave reduced (Koolhaas et al., 2010). According to Cloosterman et al. (2015), the lack of control one has over their work contributes to plans for retirement. Virtanen et al. (2021) suggest that increased control over working times from midlife to older age is associated with extended working lives. The opportunity to utilize one's strengths and potential affects work commitment, which in turn has a positive impact on health (Bakken & Torp, 2012). Challenging work tasks

alongside financial rewards are the most important reasons for continuing in working life (Proper et al., 2009). According to Sinokki (2016), good work motivation arises when work is part of an important entirety and is perceived as meaningful, then one can be committed to it. When management and treatment in the workplace are perceived as fair, work motivation is also improved (Sinokki, 2016).

According to Torp (2013), there is a motivational process in working life, where you are driven by your resources that lead to a commitment to the work, good health, and productivity. Health promotion work is described as a process that increases human control of health factors and thus increases health. The work shapes human health and thus also social differences in health (Torp, 2013). The European Network for Workplace Health Promotion (2018) monitors employers', workers', and society's efforts to improve the work organization and the working environment, as well as to promote active participation and personal development among workers. Maintaining health, skills, and knowledge are important motives for continued participation in working life. Social contacts, financial benefits, appreciation, and challenges at work also have a positive effect (Proper et al., 2009). From the perspective of the older individual, a good working life supports health and work ability (Proper et al., 2009). Economic benefits, interesting work tasks, and flexible working hours also encourage continuing in working life (Takala et al., 2015).

2.3 A summary of previous research

Above all, health and work ability, personal motives, external support, and support from employers and occupational health care affect how long people will continue in working life after retirement age. According to previous research, five themes emerge on whether one wants to continue working, which are: one's health, social contacts, challenges, skills, and rewards. To extend working life and support older employees, efforts are needed from both the occupational health service and the employer. Previous research describes what affects work ability and work motivation for the older worker. Many types of research describe the external causes that have an impact, such as certain support measures from the occupational health services and employers in the form of interventions, plans, and measures for the older employee. On the other hand, very little has been studied regarding what can increase an older person's inner energy and vitality.

3. Theoretical framework

This thesis was conducted in the framework of the theory of caritative caring to investigate the vitality sources of the older person in general life and at work. The theoretical starting points consist of the view of health and vitality that has been developed based on the theory of caritative caring (Bergbom et al., 2022). In this theory the core elements are faith, hope, love, tending, playing, and learning, and involve the categories of infinity and eternity, as well as the encounter and relationship between the caregiver and client/patient which invites a deeper, caring communion. The meaning of communion and community is understood to be similar but slightly different. Communion relates to the joining together of spirits and minds, more religiously, whereas community refers to a group of people sharing a common understanding, language and even residing together. Therefore, both terms will be used in this study, depending on the situation.

In this theory, vitality is defined as a concept and therefore constitutes a good starting point for the thesis, whose purpose is to investigate what is giving vitality to older persons at work or after their working career. The theory of caritative caring has been classified as a philosophy and therefore the focus of this theory is a central phenomenon in health care (Alligood, 2017). In this theory, health is seen as more than the absence of illness (Eriksson, 2007; Fagerström, 2010). The human being is fundamentally an entity of body, soul, and spirit. Caring is understood as a human natural phenomenon. According to this theory, love, mercy, humanity, compassion, and a caring relationship are the basic principles. Health and vitality are the main concepts in this thesis.

3.1 Health

The World Health Organization introduced the definition of health in 1948 as "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity" (WHO, 2014). This thesis' initial position is that health is seen from a holistic, multidimensional view, where health is more than the absence of disease. WHO (2021) has directives for occupational health and healthy aging. It supports collaborative meetings to discuss the health and safety problems of workers, and in its healthy aging program, the aim is to identify biological, psychological, cultural, environmental, and economic factors associated with healthy aging (WHO, 2020, 2021).

Health is an ontological concept and is central to human existence and being in the world. Health is more than just the absence of disease and illness and a

person's health resources constitute strong foundations (Fagerström, 2010; Fagerström et al., 2021). The classic pathogenic perspective is that health is a lack of illness and symptoms. In the salutogenic perspective, health and how it can be supported are emphasized (Fagerström, 2021). According to Fagerström (2021), the dialectical approach to health can deepen our understanding of health. Pathogenic and salutogenic perspectives can be understood as opposite, but they should be recognised as complementary perspectives. Health can be experienced despite illness and health promotive work supports this theory (Fagerström, 2021).

Health is seen as the wholeness of a unity of body, mind, and spirit. Health is a process of "doing", "being", and "becoming" towards unity and holiness, which is compatible with enduring suffering (Bergbom et al., 2022). When health is being likened to "doing" is it characterized by "having health". Health, which is likened to "being" means a state of health where the goal is well-being, a form of balance or harmony in the inner state. Health as "becoming" is based on the fact that human beings are constantly becoming, shaping, or dissolving without ever being finished. Becoming healthy takes place in a struggle or a drama of suffering between "sorrow and lust", "evil and good", and "life and death". In the deepest sense, it is a struggle for reconciliation that demands sacrifice before a human being finds peace and becomes aware of his innermost holiness (Erikssson, 2010). A human being cannot escape adversity, it belongs to life itself. Those who have succeeded in reconciliation can have inner peace as opposed to bitterness and discontent.

According to Wärnå-Furu & Nyström (2014), health is not a static state but a movement. Work is fundamental to human life and work has a meaning for health. A person can increase participation in his life by emphasizing health resources in the form of virtues. Virtues can provide a direction towards health and by taking these into account, one can contribute to creating healthy work cultures that strengthen the community and participation in life and work (Wärnå-Furu, 2014). Health resources can be described as internal and external health resources. Internal health resources consist of the person's physical, mental, and spiritual health resources. The person's external health resources are found in the living environment and the life context (Fagerström, 2012).

3.2 Vitality

Vitality is described slightly differently according to various sources (Table 1, Söderbacka et al., 2022). Vitality is defined as energy; like the state of being strong and active, and the power giving continuance of life present in all living

things (Oxford Dictionary). According to Merriam-Webster, vitality is the capacity to live and develop, and physical or mental vigour especially when highly developed (Merriam-Webster). In Chinese Philosophy, vitality is the very nature of existence, and the natural world exhibits consistent patterns that can be observed and followed, such as cyclical patterns based on an interaction between polar forces (Perkins, F., 2019). In this thesis, the concept of vitality is defined as 'life energy', 'inner strength' and 'inner health resource' and is the essence of health.

Vitality is the innermost dimension of health (Bergbom et al., 2022). Vitality has been described in the theory of caritative caring as the core substance and essence of health, it is a force of energy, joy and desire in life (Lindholm et al., 2005; Bergbom et al., 2022). This inner force can both be inhibited and promoted. Joy increases the life force, but when a person suffers from hopelessness and chaos, suffering needs to be met. If another human being shares the chaos and suffering, the human being can once again get in touch with his or her real health and vitality (Nyström, 2014). Nyström (2014) describes vitality as an inner dimension of health, that gives life meaning and strengthens human vitality (Lindholm, 1998, Fagerström, 2012). One assumption is that sources both in one's own life and in our environment can fill the desire for life, love and meaning, and then become important health resources that provide vitality (Fagerström, 2012). According to Strandmark (2006) vitality appears as a balance between a self-image and self-worth, resilience and zest for life. Vanajan et al. (2021) describe vitality as a feeling of physical and mental aliveness. Individual, organizational, and societal well-being are affected positively by vitality (Vanajan et al., 2021).

The path to a deeper experience of health often takes place in a struggle of suffering, and in "becoming", where a human being finally finds peace and becomes aware of their holiness. Vitality is tied to the experience of dignity and holiness (Eriksson, 2010). Even the philosopher of religion Tillich (1962) believed that man's deepest longing and desire is about the questions of life, love and meaning. Therefore, the existential deep questions become important for the understanding of what vitality is. Lindholm (1998) claims that when a person has something valuable, feels that he/she is someone of value, or is created based on the meaning of life, there is a life force. Lindholm also describes vitality as synonymous with health.

Fagerström (2000) describes vitality in connection with the patient's perceived care needs as problems, needs and desires (Fagerström, 2000). Behind the patient's longing for health and recovery, one can find a desire for life. The

patient's longing for pleasure is interpreted as a longing for something life-giving and positive or as an experience of desire takes over. Fagerström describes that human's deep longing and desire are expressed in various forms of bodily, mental and spiritual needs. Based on Tillich's (1962) theory of human desire, the essential thing for man is that his longing for life, love and meaning is nurtured and that death, meaninglessness and guilt are also kept away (Fagerström, 2000).

According to Mäkelä & Lindholm (2006), human vitality constitutes the core substance and inner movement of health. The vitality contains energy, strength, willpower and endurance. Within every human being, there are health resources and inherent health potential. A person's vitality is nourished by hope. Fellowship with others and a sense of meaning are resources that give strength to live and endure hopelessness (Lindholm et al., 2005). According to Lindholm et al. (2005), vitality is an inner dimension of health and vitality is de facto health. Vitality consists of feeling valuable and needed and being able to live based on what makes sense (Mäkelä & Lindholm, 2006). Vitality is also built up by the fact that one considers oneself to have the ability to face adversity and that one has the desire to live. From community with others arises the zest for life and self-image (Strandmark, 2006; Mäkelä & Lindholm, 2006). According to Strandmark (2006), the essence of health is a vitality, which is built upon a sense of dignity, the ability to overcome problems, and the joy of life. The individual gains strength by feeling self-respect and being able to cope with life; well-being is obtained when you experience meaning in life. This develops strength and promotes health in difficult situations. A person who is needed has a task to fulfil, which strengthens the sense of dignity (Strandmark, 2006).

3.3 Summary of theoretical framework

Vitality is the essence of health and health is part of work ability. Health is more than the absence of disease (Fagerström, 2010). Health affects work and work affects health. Vitality is described in the theory of caritative caring as the core substance and essence of health. What gives life meaning strengthens human vitality (Lindholm, 1998; Fagerström, 2012). When a person's physical, mental, spiritual and existential needs and his desire for life, love and meaning are met, vitality is strengthened (Fagerström, 2012). Vitality is bound to a person's experience of dignity and his/her holiness, and a violation of dignity leads to weakened vitality. To conclude, if we know more about what is strengthening the older worker's vitality, we may get insights into how his/her work ability can be promoted.

4. Aim and research questions

The overall goal of the thesis is to reach a new understanding of the vitality of older persons in general and in working life, and to contribute to a new understanding of what is giving vitality to older workers to continue at work, and how their vitality can be supported. Increased knowledge in this area can give experts in occupational health care, employers and leaders a new understanding that draws attention to the older employees, and a deeper understanding of what affects their health and work ability. The thesis is conducted within the framework of the theory of caritative caring.

The specific research questions of the sub-studies were:

- What positively and negatively affects the vitality of the older person? (sub-study 1)

- What is giving vitality to older workers in health care to continue at work until retirement age and maybe even an extended working life? (sub-study 2)

- What kind of interventions have been made to support older employees' health and what effects do these interventions have on older employees' work ability? (sub-study 3)

5. The overall methodological approach and description of the sub-studies (I-III)

This chapter describes the hermeneutic approach of the thesis and the methods chosen to reach an understanding and explain vitality for older persons and older workers. The methods in the three sub-studies are also described. A hermeneutic approach was used to interconnect and summarize the results in the summary of the thesis.

5.1 The hermeneutic approach in the thesis

According to Gadamer (1997), a study with a hermeneutic approach has the intention to uncover and understand the substance, explain, and apply. Hermeneutics is an important research methodology in the humanities, and art history (Ali & Abushaikha, 2019).

Hermeneutics is based on a holistic perspective, which means the whole goes before the parts. Objectivist hermeneutics emphasizes understanding the underlying meaning, not the explanation of causal connections. Alethic hermeneutics emphasizes that truth is an act of disclosure (Alvesson & Sköldberg, 2017). A special attitude is also required of the interpreter, neither dominance nor prostration, but to be able to interpret the character of the text. The interpreter must respect the autonomy of the subject. Interpretation is also associated with empathy, in that one puts oneself into the writer's or speaker's situation (Alvesson & Sköldberg, 2017). The object should be understood in terms of itself, and the text must have listened to so many times until it no longer responds with new information. Every world is a horizon of sentences. A horizon can change from one time to another. The horizon of understanding consists of our preconceptions and perceptions in a horizon of understanding. The hermeneutic process helps to modify the horizon of understanding, based on what one is trying to understand (Gadamer 1997, Alvesson & Sköldberg, 2017).

Preconception is the understanding that I as a researcher bring with me from my past and my clinical experience. The literature review and theoretical perspective also affect my preunderstanding. Awareness of preunderstanding is important to consider when interpreting. My preunderstanding has been formed over many years, during my 28 years working in occupational health as an occupational health nurse and a leader in occupational health. One of the main tasks in occupational health is to promote health and support workers in

the different stages of their careers. Health and older workers' health and work ability are a daily recurring theme. Different solutions to support the work ability during the workers' careers are highlighted at network meetings. As a researcher, I have strived to be aware of my preunderstanding during the interpretation of the material. In this way, a new understanding has arisen.

Understanding is the process that encompasses and understands the living human experience. Human existence must be understood and should also be understood in its context. When one understands, one can see the possibilities and choose them. In hermeneutics, the meeting between people is also emphasized. The reality in and around humans can only be understood and thus never explained in the true scientific sense (Eriksson & Lindström, 2007).

The human must understand the whole from the individual and the individual from the whole, thus, it is about one circular relationship. The understanding constantly moves from whole to part and back to whole (Gadamer, 1997). Hermeneutics helps us to gain a deeper understanding of human reality (Eriksson & Lindström, 2007). Human's "being", "doing", and "becoming" can be understood and communicated to others through thinking and putting words into thoughts (Näsman, 2020). Hermeneutics focuses on interpreting the meaning of experiences in the individual's life and is a qualitative research methodology.

My interest in vitality started when I was introduced to the GERDA (Gerontological Regional Database) project, which has contributed to deepening my knowledge of various aspects of the older persons' health and living conditions in Västerbotten, Sweden, and Österbotten, Finland. Because of my work context, which has been occupational health throughout my professional career, the interest in the vitality of older workers was aroused. At the same time, recommendations came from the ministry, that working life must be extended due to a shortage of labour in the future. This requires active interventions by occupational health and the employer. The first sub-study contains research on the vitality of older persons. The second sub-study continues the vitality theme among older workers. The third sub-study highlights what kind of interventions have been made for supporting older workers in their careers.

5.2 Description of the sub-studies (I-III)

In the sub-studies, different designs and methods have been used. The first sub-study was a questionnaire study, the second sub-study was a qualitative semi-

structured interview study, and the third sub-study was a scoping review. All studies concern older persons or older workers, health and vitality.

Sub-study one was conducted among older persons living at home and describes what gives vitality and what can have a positive or negative effect on it. The study is based on a cross-sectional survey and has a descriptive and exploratory design.

The second sub-study answers the question of what is giving vitality to older workers in health care to continue at work until retirement age and maybe even an extended working life The qualitative interview study was done in the health care sector and describes what is giving vitality to older workers in health care to continue at work until retirement age and maybe even extend their working life.

Sub-study three provides answers on what interventions have been made to maintain the older employees' health and what effects these interventions have had on their work ability. A scoping review focuses on providing an overview of the research landscape like a systematic literature review, it presents findings and identifies gaps in the research (Arksey & O'Malley, 2005).

An overview of all three studies is presented in Table 1, including the aims, material and methods.

Table 1. An overview of all three studies included in the thesis

Sub-study	**1. Older persons' experiences of what influences their vitality – a study of 65- and 75-year-olds in Finland and Sweden**	**2. What is giving vitality to continue at work? - A qualitative study of older health professionals' vitality sources**	**3. Workplace interventions that support older employees' health and work ability - a scoping review**
Aim	To explore and describe older persons' vitality and their subjective experiences of what influences their vitality, despite disease and suffering	To explore what is giving vitality to older workers in health care to continue at work until retirement age and maybe even an extended working life	To examine workplace interventions that support older employees' health and what effects do these interventions have on older employees' work ability?
Material	A comprehensive questionnaire including two open-ended questions about vitality was sent to 4927 older persons aged 65 and 75, and a total of 2579 responded to the open-ended questions	A total of 15 people aged 59–65 participated in the study, all of them working in the health care sector	A total of 8 articles were found to meet the inclusion and exclusion criteria
Method	Qualitative content analysis was used	Qualitative content analysis was used	A scoping review
Journal	Scandinavian Journal of Caring Sciences, 2017	Scandinavian Journal of Caring Sciences, 2022	BMC Health Services Research, 2020

6. Methods

6.1 Participants, materials and data collection

Sub-study 1

The first sub-study has its background in the GERDA project, which is a resource centre for the development of care, and cares for the elderly in Ostrobothnia, Finland, and Västerbotten, Sweden. A survey study was done in September and November 2005 in Finland and Sweden. Data on old people's living conditions, view of life, health, diseases, and illnesses were collected; the health of old people was in focus (Jungerstam et al., 2012). The comprehensive survey included two open-ended questions on vitality: "Name a few things that give you vitality" and "Name a few things that negatively influence your vitality". These answers constitute the material for sub-study 1.

The entire survey was conducted among people between 65- and 75 years old (the year 2005), born in 1930 and 1940, in Ostrobothnia, Finland, and Västerbotten, Sweden. To conduct the randomization, Finnish and Swedish governments' civil registry lists were used. Every second inhabitant in the two most populous towns in Österbotten and every third inhabitant in Västerbotten, and all persons aged 65 and 75 who were inhabitants in less populous municipalities, were contacted with the questionnaire. In total there were 84 questions (15 pages) about general health, health problems, and living conditions, and a further two open-ended questions about vitality (see above). In total, 4927 questionnaires were sent, along with a follow-up questionnaire that was sent after 4 weeks. Totally 3370 people answered the survey, and 2579 responses were received for the two open questions (of the 76,5% of the received responses, 57.3 % were women and 42.7% were men). Regarding background variables, sex, language and marital status see Table 2.

Table 2. Background variables; sex, language group, marital status

Sex	N	%
Woman	1478	57,3
Men	1101	42,7
Total	2579	100
Language		
Swedish (Sweden)	1416	54,9
Swedish (Finland)	706	27,4
Finnish	457	17,7
Total	2579	100
Marital status		
With spouse	1882	73,0
Divorced	170	6,6
Single	119	4,6
Widow	395	15,3
Not known	13	0,5
Total	2579	100

Sub-study 2

The second sub-study was conducted in Ostrobothnia, Finland (European Region) in January–February 2019 in a municipal hospital and a private small health station. The Human Resource department assisted by sending out the information about the study to the personnel through the hospital's intranet, as well as an information letter which was sent to a small private health station. There was only one inclusion criterion, which was employees over 60 years old who were interested to participate in the study could sign up. The deadline to participate was at the end of January 2019. A total of 14 women and 1 man wanted to participate in the study (See Table 3), all aged 59-65 (mean=x). One of them was a 59-year-old person who wanted to participate and was allowed. Participants sent their written permission for participating by e-mail or by a form to the doctoral student. Fourteen participants were from the public sector and one person participated from the private sector. Of the participants, five people were administrative personnel, like head nurses (who had also participated in care work) with an average age of 60,4 years. The remaining ten people were nurses and the average age of the ten nurses was 62,2 years. The

average work experience for administration personnel was 36,4 years, and 31,6 years for nurses. Three of the nurses planned to work after the official retirement age and two nurses of the fifteen participants were at the time of the interview working after their official retirement age. Nine of the participants were Finnish-speaking and six were Swedish-speaking.

Table 3. Background facts of the participants

Duty	W	M	Age	Work experience
Nurses	9	1	62, 62, 63, 60, 63, 61, 62, 65, 61,63 (60-65) avg. 62,2	30, 23, 41,30, 23, 22, 38, 42, 37, 30 (22-42) avg. 31,6
Administration	5	-	60, 63, 60, 59, 60 (59 - 63) avg. 60,4	40, 25, 39, 38, 40 (25 - 40) avg. 36,4

Interviews were done, according to the participants' wishes, at their workplace or the University campus. The researcher made appointments with the personnel and performed the interviews in January-February 2019. The interviews lasted about 60 minutes each. Semi-structured interviews were used, and interview questions were based on the research question: what is giving vitality to older workers in health care to continue at work until retirement age and maybe even an extended working life? The interviews were recorded and transcribed, yielding in total of 137 pages (Times New Roman 12-pt).

The interview questions were:
1. How does the job affect yours a) physical health, b) mental health?
2. What gives you the strength and energy to continue in work?
3. How can occupational health care support you in continuing your work career?
4. In your opinion, how could the employer support you in continuing your work career?
5. What has a positive effect on your work motivation?
6. What negatively affects your work motivation?
7. In view of your age and health, what is the ideal weekly working time and how would you prefer to distribute the working time?
8. How long do you intend to continue working?
9. Do you want changes in your work image if you continue?
10. How do you think working life in Finland can be extended?

Sub-study 3

In the third sub-study, a scoping review was used as the method. A scoping review is a common method in health sciences today, used to summarize and synthesize health evidence and is a useful method when charting what is known about a subject. The purpose of the scoping review was to identify knowledge gaps. According to Arksey & O'Malley (2005), a scoping review is an overview study to provide a picture of the research that exists in an area and identify what is missing in this research area. First, the research question was identified, then relevant literature was identified and selected, and the data was charted and collated, summarized, and reported.

A search was conducted in articles published between 2007 and early 2019 in PubMed and EBSCO (Academic Search Premier, CINAHL, PsycArticles, and PsycINFO). The search was made using the following search terms and with a focus on older employees: "health", "intervention" and "older employee". 27 articles were found from EBSCO and 33121 from PubMed. The search term, "work ability" was added, and the second search of PubMed was done, limited to articles no older than twelve years old. The result of this search was 607 articles, a total of 634 articles from the first and second database searches. A further 76 articles were found through other sources (Google Scholar). Finally, title and abstract screening included a total of 710 articles. Title and abstract screening excluded 656 articles as not relevant. From the remaining 54 articles, a further 20 were excluded. In the next stage, the 34 articles were analysed, resulting in 26 articles being excluded because they were not sufficiently relevant for the study. In the inclusion stage, a total of 8 articles were selected for inclusion by the inclusion criteria. The PRISMA flow diagram describes the process of the study selection (Figure 1, Söderbacka et al., 2020). Articles were included if the following criteria were met: health-supporting interventions had been made for older employees in workplaces. All the studies focused on interventions that prolonged working life. The mean age ranged from 50 to 55 years.

6.2 Data analysis

The research question was answered by different methods (See Table 1)

Sub-study 1

Qualitative manifest content analysis was used for data analysis (Graneheim & Lundman, 2004) and initial quantitative analysis was used for the questionnaire responses, because of the large data material (Elo & Kyngäs, 2008). Content analysis is a way of organizing and describing the investigated phenomenon

(Kyngäs et al., 2011, Graneheim & Lundman, 2004, Graneheim et al., 2017). In the first step of this explorative and descriptive study, the answers were transcribed and compiled into one document (about 80 pages). In the second step, all answers (2579 answers) were read through and answers with similar content were coded. All answers were quantitatively counted and given a code (15 codes that affect vitality positively, 14 codes that affect vitality negatively).

In step three, all sentences that defined the codes given in step two were read through carefully. From the understanding of the meaning-bearing content, the codes were sorted into subcategories based on similarities and dissimilarities in content, and the subcategories were also calculated quantitatively. Subcategories regarding the same phenomenon were sorted into categories: participants' subjective experiences of what positively or negatively influences their vitality. In the fourth step, categories with similar content were developed into themes (Figures 1-3, Söderbacka et al., 2017).

Sub-study 2

In sub-study 2 qualitative content analysis was used to analyse the answers from 15 semi-structured interviews. The answers to the question, what gives vitality to continue working were analysed according to content analysis with an inductive approach (Graneheim & Lundman, 2004, Graneheim et al., 2017). The data was read several times and meaning units were identified, followed by condensing, coding, and abstracting into subcategories and later into categories. The material was sorted into fourteen subcategories and the subcategories were sorted into five categories. The material was sorted manually. The subcategory was included in only one category.

Sub-study 3

A chart of the data was created to present the data in a comprehensively, including characteristics such as author, year of publication, origin, aim/purpose, methods, participants, intervention, outcome, and key findings (Table 1, Söderbacka et al., 2020). According to similarities and differences in the included intervention studies, they were divided into three main groups.

6.3 Ethical considerations

This thesis follows the guidelines of good scientific practice. According to Tenk (2019), the principles of integrity, meticulousness, and accuracy in conducting research, and in recording, presenting, and evaluating the research results are followed. The thesis strives to open data and materials and provide new

knowledge. The articles are published in international journals, two of them with open access. The ethical principles for research that is part of the humanities are divided into three sub-areas: respect for the investigated person's right to self-determination, avoidance of harm, and personal integrity and data protection (Research Ethics Delegation, 2009). The thesis follows the twelve golden rules of Ethical Research Conduct (Ethics for researchers, 2013). According to these rules, persons' integrity and dignity are respected in the thesis. Participation in the studies is based on voluntariness to participate. Participants were informed both in writing and verbally that the material was treated confidentially and how the results will be presented, as well as their right to cancel their participation at any time. The rights of anonymity and personal data protection were paid attention to. In both sub-study 1 and 2, participants were given a number, instead of using names. Any risks were discussed when applying for a research permit (sub-study 2). The interviews were recorded and transcribed. After transcription recordings were deleted. Data analysis is still saved by the researcher, but after the research project/ doctoral dissertation, the material will be destroyed. Focus has been on research and research topics; unnecessary data collection is not performed.

The participants in the sub-studies were informed about the content and purpose of the studies. In the second sub-study, there was also written permission for the interviews. Participants were informed that no names or personal information will appear in the data analysis or the results. In the first sub-study, ethical permission for the study was sought by the GERDA project from local ethical committees (Ethics Committee of the Medical Faculty, Umeå University (§99-326) and by the local Research Ethics Committee of Vaasa Central Hospital), who are responsible for maintaining standards in both Ostrobothnia and Västerbotten. The study also met general research requirements. In the second sub-study, guidelines from The Finnish National Board on Research (2019) have been used in planning, conducting, and reporting the research. Good scientific practice is used in the interviews with information about confidentiality, including anonymity and participants' right to interrupt the interview at any time. No one interrupted the study. Ethical permission was requested and granted by Åbo Akademi University (Jan 14, 2019) and research permits were granted by the head nurses (Feb 15, 2019, and Mar 1, 2019) of the organizations. In the third sub-study, Workplace interventions that support older employees' health and work ability - a scoping review, no permits were applied for the study itself, as ethical approval is not required in a scoping review. The ethical principles had already been considered when the selected studies were done. Precision and accuracy are important in a scoping review, so

relevant material will not be bypassed. The search method is of great importance, keywords, databases, and when the search is done, are crucial for the result. Material has been analysed according to principles of good research practice. Summarizing by the Joanna Briggs Institute (Peters et al., 2015) was followed by the Prisma checklist.

7. Results

In this section, the results of the various sub-studies are presented. First, what positively and negatively affects the vitality of the older persons is presented. The second part presents factors that influence the vitality to continue to work in the care context. The third part, which is a scoping review, presents studies on interventions made for older employees.

7.1 Sub-study 1

The participants in the first sub-study expressed factors that have a positive effect on vitality to be children (50.7%), grandchildren (46.5%), partners (36.9%), interests (20.5%), friends (19.6%) and health (18.5%) (Table 4).

Important sources of vitality were a safe and confirming communion, meaningful activities, an optimal state of health and an inner strength. Ageing that includes illness or a restricted life, happenings in the world and in one's close environment that threaten inner meaningfulness, and mental burdens that give rise to a feeling of hopelessness or depression weaken vitality.

A safe and confirming communion and immediate family were sources of vitality. Sharing both joy and sorrow, having someone to help and be able to help others is important in communion. Having the opportunity to age with one's partner and to be there for children and grandchildren gave the participants strength. In addition to a family that cares, it is at least as important to feel needed and able to help when the family needs help. A person is affirmed through relationships and by spending time with a person where the relationship is mutual. Relationships which involve love and reciprocation, to love and to be loved, are a source of vitality. Work-related activities in the form of work and volunteer work, being needed and having meaningful activities are also sources of vitality for older persons. By helping other people, older persons help themselves to be physically and mentally active. Many participants mentioned that interests such as needlework, weaving, good food and drink, church life, and membership in a club or association have a positive effect on their vitality. Summer cottages, music, sports, and travel were also stated as positive sources of vitality.

Relatively good health was often present in the answers as a prerequisite for an active life. Interests in the form of physical activity also provide vitality, e.g., exercising, motorcycling, sailing, fishing, or moose hunting. Cultural activities such as music, television, reading, cultural experiences, theatre, choir singing, dancing, or attending courses also provide vitality. Nature and seasonal changes

in weather are experienced as sources of vitality. Some participants experienced nature as spiritual. The garden and walks in the woods give strength to everyday life. The opportunity to live at home is so valuable that they also indirectly experience home services and cleaning help as a source of vitality. The home is a sanctuary for body and soul, where an older person is nourished and rested.

Table 4. Factors that give vitality

Positive factors	N	%
Children	1308	50,7
Grandchildren	1199	46,5
Partner	952	36,9
Hobbies	529	20,5
Friends	505	19,6
Health	478	18,5
Religion	381	14,8
Mental resources	341	13,2
Nature	246	9,5
Family	171	6,6
Living	98	3,8
Economy	52	2,0
Work	43	1,7
Physical function	20	0,8
Other	47	1,8

Integrity is important, the home is associated with independence and the right to self-determination. Being able to take care of oneself is a source of strength and pride. Many participants mentioned that a fairly strong financial situation gives them a sense of security and independence. At this age, it is possible to enjoy the luxuries of life if health and financial situations allow it. To have something to look forward to, such as travelling or some purchases, is a source of inspiration even for this age group. Participants described physical well-being as vitality in terms of good physical functioning and independence.

A difficult period can be turned into a strength and afterwards one can feel grateful and stronger. The realization that one has survived adversity, crises or illness gives strength to continue living. An expression of spiritual strength, such as a positive attitude to life, optimism, humour, good self-confidence, social knowledge, sisu (can be translated into English as will, determination,

perseverance, or rational action in the face of adversity), curiosity, belief in oneself and one's possibilities, peace of mind, joy, the joy of life, and personal life energy contributes to vitality. Personal faith means the strength to handle daily life. Faith gives content to daily life; prayer, faith in God, Bible reading, and participation in the church provide vitality. A belief in a life after death gives security, strength, and hope, and gives a feeling that life is more than what we see and experience now. Fellowship, such as church fellowship and fellowship with God, gives vitality.

According to the participants in the study, illness is the most common cause (23.9%) which harms vitality, followed by events in the world and the local environment (12.7%), unfavourable housing conditions (9.5%) and family problems (7.4%) (Table 5).

The vitality of many participants was also affected by disease-related problems such as suffering, declining strength, pain, or depression. It was noted, however, that even if you have an illness, you can still have a good life. Physical changes and functional impairment in connection with age are a natural part of life but are experienced as harming vitality. The fear of becoming ill, sleeping problems and poorer physical and mental capacity harm vitality. Events in the world, in the immediate vicinity, social factors, natural disasters, evil in the world, unpleasant events, indifference, war, injustice, evil people, jealousy and negative news or conflicts affected the vitality of the participants negatively.

Unfavourable living conditions, internal nonsense, such as financial problems, poor housing, small pensions, long distances, stress, or a decline in the quality of service for older people harm vitality. Life crises that cause grief which affects mental health, for example, the death of a spouse after a long marriage is often great grief that hurts their vitality. General concerns and worries, about both large and small things, also harm vitality. Life changes can lead to negative and depressive thoughts that reduced the participants' vitality, e.g., marital crises, deaths of family and friends, conflicts in relationships, retirement, changes in the care system, memory loss, suffering, or loneliness.

Table 5. Factors that reduce vitality:

Negative factors	N	%
Diseases	616	23,9
The outside world	328	12,7
Negative living conditions	246	9,5
Problems with relatives	190	7,4
Pain	143	5,5
Impaired physical capacity	126	4,9
Crisis	101	3,9
Aging	79	3,1
Anxiety	69	2,7
Loneliness	64	2,5
Impaired mental capacity	49	1,9
Sight	24	0,9
Hearing	18	0,7
Other	74	2,9

Fellowship, meaningful activities, a sense of security and health are important for the vitality of 65 and 75-year-olds in this study. In the analysis of the participants' responses, it was seen that communion is not only a one-sided relationship but a mutual relationship. It is at least as important for the older persons to feel useful and important to their loved ones. Concerns about future generations and concerns about who should take care of them when care is needed also emerged. For some, adversity strengthened their fighting spirit and perhaps in the long run strengthened their vitality. Sometimes participants experienced that they had gained strength through adversity and had a sense of mastery, inner strength and sisu.

The results of this study support the definition that personality and mental resources affect vitality. Accepting the realities of life, being independent, having

a sense of humour, joy, life experience and having faith in God were described as personal resources. Beliefs that give a feeling of security and belief in one's own ability to cope with life affect health positively. Spiritual strength was described as finding joy despite adversity. Factors that negatively affect vitality are often a threat to one's existential health. The vitality is in each person's innermost being. When an older person receives strength from external sources, this also affects their vitality and they find inner peace and satisfaction. A supportive communion with family and friends, experiencing the feeling of being useful, physical or cultural activities that provide one with meaning, a safe home and safe environment, an orderly financial situation, physical well-being, mental resources, and religion were important sources of strength for participants in this study. The absence or lack of these factors had a clear negative effect. These factors reduce the feeling of non-existence and fulfil the human longing for life, love and meaning.

Participants' experiences of what positively or negatively influences their vitality are presented in Figure 2. Relationships based on mutual sharing and communion are a source of vitality. Work gives meaning and context to everyday life, and in this age, group work is often voluntary and unpaid, but nevertheless, it gives a feeling of being useful. Being useful and having a role is more important than receiving a salary. External resources that provide one with security, a sense of home, and one's routines are important for the older persons. An optimal state of health and inner strength that gives a feeling of personal independence, well-being and harmony gives vitality. Factors which reduce vitality are aging which includes illness and a more restrictive lifestyle, and crises in the world or one's immediate environment, such as those that threaten the inner meaning and cause feelings of hopelessness or depression. Family problems, as well as mental strain, can cause a feeling of hopelessness and depression (Figure 2).

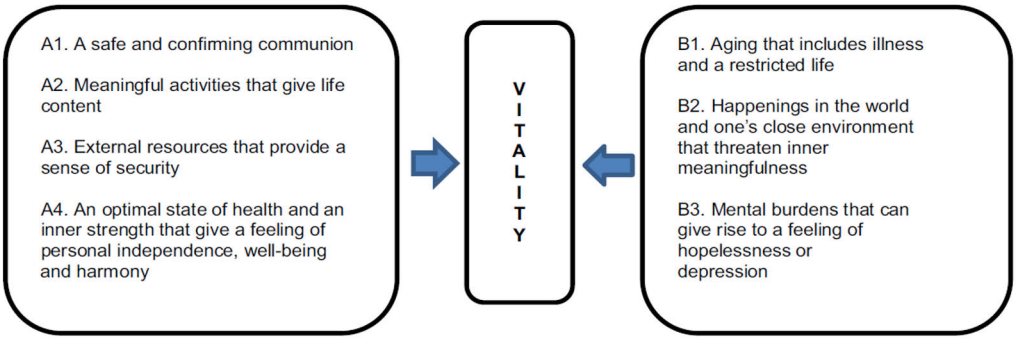

Figure 2. Participants' experiences of what positively and negatively influences their vitality, seen as themes

7.2 Sub-study 2

In the sub-study two qualitative analysis is used on the material. Results in the sub-study consist of five main categories of what gives vitality to continue working (Table 6): *a meaningful work, relationships and a work community, working conditions and benefits, opportunities to use knowledge and skills, personal values and own health.*

Table 6. External and internal health resources

External health resources	**Internal health resources**
a meaningful work	opportunities to use knowledge and skills
relationships and a work community	personal values and own health
working conditions and benefits	

External health resources

The older workers in health care who took part in the interview think that work gives meaning to life due to its content. According to the informants, a *meaningful work*, and feeling useful and needed, are the sources of vitality which increase their ability to continue at work. Helping others gives a sense of satisfaction and many of the informants believe that a life without work would feel empty. They receive affirmation from work by seeing satisfied patients; the work contribution is important when one can see results.

Good *relationships* and a feeling of being part of the work community provide vitality. Having fun with colleagues and seeing the results of teamwork strengthens the togetherness and the work community. Some may share both joy

and sadness with colleagues. Taking care of each other provides security, and trust increases well-being at work. Sick leave which is noted in the workgroup makes one feel valued at work. Feedback from patients, colleagues and supervisors is important, it gives a feeling of being essential and useful, and that one has a role in the team.

Routines and rhythm in the working day are experienced as positive. *Working conditions and benefits* are important and affect the willingness to work. A person's financial situation also affects how one thinks about continuing to work. Money and receiving enough retirement money are reasons to continue at work. According to the informants in this study, good leadership, a fair leader, an introduction to tasks and someone who has time to provide support in the tasks when needed, are sources of what influence how one copes with the work and how long one wants to continue working. A good working environment and an open work community support the work ability of older workers. Leadership creates the atmosphere of how to act in the workplace.

Internal health resources

The *opportunities to use experience and skills* and at the same time to learn something new gives vitality to continue working. According to the interviewees, it would feel like wasted resources if their knowledge and experience were not used. Interesting work, seeing and learning new things, and taking part in new research results are sources of vitality to continue working. One participant said, "when you know that you are good at work and have professional pride, it gives vitality". Getting new tasks and challenges encourages the desire to continue working.

Some individual factors that give strength to continue working are *values and attitudes*. Openness and a positive attitude to life provide the strength needed to work. Participants who work after retirement age believe that when there is an awareness that you can stop working and that it is your own choice if you continue to work, that is perceived as positive.

Based on the interviews with older workers in the health care context, plans to continue working seem to depend on both internal and external resources. The study revealed that external health resources exist in the work environment and the community, such as meaningful work, positive relationships in the work community, and working conditions and benefits. Internal factors are related to personal characteristics, such as personal health, a genuine desire to help others, to be needed and valuable, and personal values such as attitude to work and experiencing meaning in work.

Experiencing meaning in work as a source of vitality is clear in the second sub-study. By serving others and thus being useful and valuable, the work is perceived as meaningful and strengthens the vitality and willingness to continue working. The opportunity to utilize knowledge and experience is also a resource for vitality. According to the informants, they feel valuable through relationships with colleagues, and getting support from colleagues and supervisors is highly valued. Warm and positive relationships strengthen the work community and the willingness to continue working is strengthened. Sources of vitality affect work ability and when routines at work are well planned, it also has a positive effect.

7.3 Sub-study 3

The third sub-study was a review study "Workplace interventions that support older employees' health and work ability - a scoping review". Three main categories of interventions that were described in this sub-study were *health checks and counselling for workers at an individual level, interventions based on screening among employees, and improvements in the work environment or organization.*

Five studies were conducted in Europe, two in Japan and one in South Africa. Included in the eight studies were four in-depth reviews; participants' ages varied between 37 and 74 years. Participants' professions in the studies that were included were among others: office workers, newspaper company management, academic hospital management, intensive care workers, administrative personnel, executive workers and executive worker supervisors. In six of the studies both women and men were included, one study included only men, and one study only women. In two studies employees were older than 60 years old, in five studies employees were older than 40 years old, and in one study the mean age was 50,8 years, which included employees in an age range of 37 and 63 years old. Different research designs were used: a systematic review (1), narrative synthesis (1), statistical analyses of data (2), randomized controlled trial design (2) and others (2). During the charting of the content of the interventions that support older employees' health, three main categories based on similarities were identified: "health checks and counselling for employees on the individual level" (3), "interventions based on screenings" (3), and "improvements in work environment or organization" (3). One study included both intervention (WAI) and improvements in the work environment or organization (Koolhaas et al., 2010).

Positive changes in behaviour and minor health risks can be achieved through counselling and this, in turn, increases work ability. Measurements and screenings are good ways to follow up work ability and health status among employees. Training for supervisors and support from them seem to have positive effects on health outcomes and therefore increases work ability. To guarantee good results from the interventions, employers should focus on workers' health when workers are younger. Workplaces that promote workers' health by strengthening the resources of older workers encourage workers to live longer.

Ariyoshi (2009) led an intervention study in a workplace for women with symptoms of menopause. Personal consultations with specialists were performed. Kohro et al. (2008) examined an intervention related to a national campaign for all Japanese citizens, for the prevention of lifestyle-related diseases. This included workplace and health review programs (individual and group counselling) for workers, and health checks for retired workers.

Interventions based on screening were found in three studies. WAI is an instrument used in clinical occupational health care and research to assess work ability, e.g. via health checks and workplace visits (Ilmarinen, 2005). Costa et al. (2011) used WAI, intending to create a decision-making health maintenance system, to evaluate workers in the IT sector. Koolhaas et al. (2010) used WAI and a self-reported 12-point questionnaire to evaluate improvements in health-related outcomes. Rothberg et al. (2007) identified the possibility of a targeted examination program for aortic aneurysms using ultrasound screening.

In three studies, the interventions were performed to improve the work environment or organization that was examined. Training supervisors was an intervention used to extend staff participation in working life. Wagner et al. (2008) created a cognitive training program that was implemented and evaluated for middle-aged staff. Some interventions were made at both individual and organizational levels. Koolhaas et al. (2010) examined managers' ability to support employees by strengthening knowledge and skills and better utilization of the HR department and occupational health care.

Intervention in an organization was performed, where workplaces received financial support to implement vocational rehabilitation activities, intended to improve the physical environment (Cloostermans et al., 2015). Effects of interventions on older people's work ability can generally lead to positive behavioural changes, and health counselling can lead to fewer health risks. Kohro et al. (2008) noted that a national health program can raise public awareness but

believe that it takes at least 10 years before it is possible to evaluate the benefits in primary prevention. Strijk et al. (2013) noted that it is important that the participants are committed to the intervention study to achieve results.

Strijk et al.'s (2013) study on the yoga and gymnastics group showed, after 12 months, increased energy, but no significant difference was found in work engagement, productivity, or in sick leave between the intervention and control group in follow-up studies. Cloostermans et al. (2015) found that the risk of early retirement was almost twice as low in the group that received more financial support than the control group with less support. The interventions included individual training programs, workplace programs, personal trainer programs, weekly guided exercises, yoga classes, free fruit, advice and training, vocational programs for senior workers led by occupational physicians, and financial support to implement rehabilitative activities (Cloostermans et al., 2015).

Distinguishing menopausal symptoms and mental problems is not always easy. Ariyoshi (2009) considered that by implementing changes in the health system, pensions and deaths during professional careers as well as sick leave decreased among women who described symptoms due to menopause. Wagner et al. (2008) found that a cognitive training program is useful for patients with mild cognitive impairments: the intervention group showed improved results in memory tests and subjective memory performance and a significantly reduced level of fatigue. Most of Wagners et al. (2008) members of the study reported that they had better self-confidence at work after the course and felt more proficient in distancing themselves from work demands. Costa et al. (2011) consider that evaluation of work ability is elementary when it comes to creating age-friendly workplaces. It enables the identification of employees with weak working abilities earlier so that working conditions can be improved and the professional employee's professional career can be supported in their current work. They developed interventions based on WAI results and noticed that WAI is a useful tool to support work ability on an individual level.

Koolhaas et al. (2010) used and investigated a structured method, where employees could communicate with supervisors about their work environment, challenges, work performance as well as career opportunities. Support from colleagues, informal networks and superiors were seen as positive and training for supervisors reduced stereotypes, team conflicts and increased innovations. Rothberg et al. (2007) found that examination programs, such as screening for abdominal artery aneurysms, are a costly intervention but reduce morbidity and mortality.

Few studies on interventions concerning older workers are seen and Poscia et al. (2016) report that workplace health prevention activities for older workers are generally of poor quality. To guarantee good results, the employer should focus on the health of the workers and interventions should be made when the workers are younger. It should also be remembered that the employee's mental process concerning retirement, starts around the age of 55 (Koolhaas et al., 2010).

From a social perspective, workers' decreased work ability and early retirement result in higher costs for employers and inadequate labour force numbers. From an individual perspective, a good working life supports the older workers' health and work ability. Health promotion interventions are positive for older workers. Health checks and counselling for workers on an individual level can support older workers' work ability. Health campaigns that focus on the older workers' health and work ability can be costly, but early retirement due to poor work ability is even more expensive and is often a result of the worker's suffering. The regular follow-ups of employees' work ability through measurements and screening provide occupational health care with information by predicting risks for early retirement and this indicates that health counselling can reduce health risks. Interventions based on measurements and screenings also seemed to support the worker's work ability.

Occasional screenings seem to be an expensive way to collect health status data. Improvements in the work environment or organization seemed to support the older worker's work ability. The focus cannot be solely on the employee; also, management, and organizational changes, including personal consultations for workers seemed to be effective ways to extend participation in working life and to improve work ability for workers. The opportunity to talk to supervisors had a positive effect on health outcomes and increased work ability (Koolhaas et al., 2010). Other interventions required very long-term participation, which is often unrealistic for participants. According to Thorsen et al. (2012) work ability is the main reason for retirement plans for both genders.

Torp and Vinje (2014) also found that sustainable production depends on workers' health. Motivation and commitment to work also influence work ability. Many workers think of their functional limitations as part of normal aging. Steenstra et al. (2017) recommended that versatile interventions including health services, coordination of services and work modifications can be used to strengthen older employees' participation in work. Honkonen et al. (2018) found that work ability meetings can provide a forum to discuss workplace adjustments that support employees' remaining years in work, including e.g. work modifications, adjustments and vocational rehabilitation. Unfortunately, not all

employees who would benefit from age-related workplace adjustments believe that their needs are met (McMullin & Shuey, 2006). Studies on interventions related to the individual's resources (values, attitudes and motivation) did not arise in the study. The small selection of articles related to interventions tells us that there is a shortage and that research is needed in this area.

7.4 Interpretation of results

The key findings of the sub-studies are summarized in Table 7.

Table 7. A summary of results of sub-studies I-III

Sub-study	**I**	**II**	**III**
Research question	What positively and negatively affects the vitality of the older person?	What is giving vitality to older workers in health care to continue at work until retirement age and maybe even an extended working life?	What kind of interventions have been made to support older employees' health and what effects do these interventions have on older employees' work ability?
Result	A safe and confirming community, meaningful activities, an optimal state of health, and inner strength were important sources of vitality. Ageing that includes illness or a restricted life, happenings in the world and in one's close environment that threaten inner meaningfulness, and mental burdens that give rise to a feeling of hopelessness or depression decrease vitality.	Plans to continue working, depend on both internal and external resources. Internal health resources that affect vitality are opportunities to use knowledge and skills, personal values and own health. External health resources that promote vitality are meaningful work, relationships and work community, working conditions, and benefits.	Three intervention categories were discerned: health checks and counselling for employees on the individual level, interventions based on screenings, and improvements in the work environment or organization. Positive behavioral change and lowered health risks can be achieved through health counselling. Measurements and screenings comprise good ways to chart and follow up on employees' work ability and health status. Supervisor training and support from supervisors were seen to have a positive effect on health outcomes and increased work ability.

In the last phase of the entire research, the results of the sub-studies were interpreted and summarized. A hermeneutic approach was conducted when the results were interviewed together to create a more comprehensive picture of understanding the vitality for older persons and workers. The hermeneutic picture of understanding vitality is deepened in the Discussion chapter.

Health resources that support vitality and factors reducing vitality are summarized in Figure 3. The results of the thesis highlight the vitality sources for older persons and what gives vitality to older workers to continue at work until retirement age and maybe even an extended working life. The thesis also highlights what kind of interventions have been made to support older employees' health and what effects do these interventions have on older employees' work ability. There were not many intervention studies with a focus on older employees, and interventions that did include older employees had limited follow-up. The intervention studies did not include studies about values, attitudes, or motivation. A hermeneutic interpretation of the results is that meaningful work and a feeling of belonging to a community are health resources. Work, where one is helping others, strengthens vitality. The desire to help others may also be a personal value.

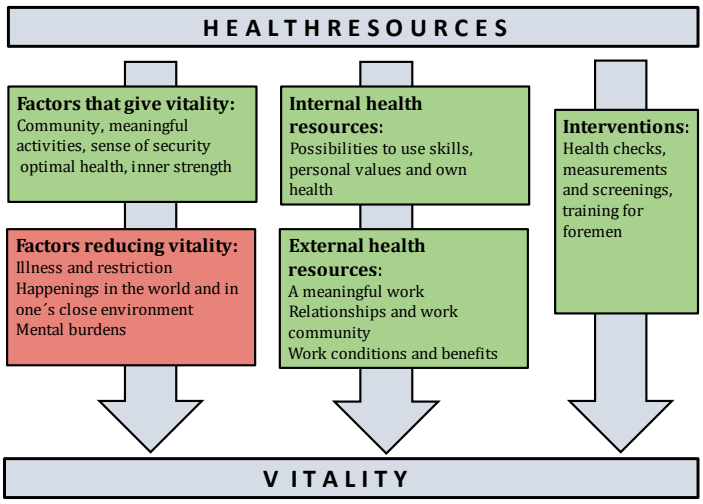

Figure 3. A hermeneutic understanding of older persons' health resources that support or reduce vitality.

8. Discussion

The present thesis aims to reach a new understanding of what gives vitality to older persons in general and in working life, and what gives the older worker vitality to continue to work and how their vitality can be supported. The thesis deepens the understanding of the older person's vitality. According to the theoretical framework, health and vitality are strongly linked together and vitality is the essence of health.

8.1 Vitality and older persons

The specific research question of the first sub-study was: What positively and negatively affects the vitality of the older person? Factors that give vitality to 65-75-year-old people are a safe and confirming communion, meaningful activities, optimal health as well as inner strength.

Participants in the first sub-study mentioned that communion with others and relationships with mutual sharing give strength. Results showed that voluntary work can also fill this need of being needed. Meaningful activities, like cultural and physical activities, a home, health, mental resources, and religion constituted important sources of strength for older persons in the first sub-study. The finding is supported by earlier studies, suggesting that factors such as love and meaning in a person's life can meet one's most fundamental longing for a life in communion, and is therefore an important health resource for older (Fagerström, 2010). The lack of these decreased vitality. It is therefore important that healthcare professionals strengthen the vitality of older people during the aging process. By considering what positively and negatively affects the vitality of each individual i.e., having a person-centred approach, healthcare professionals can strengthen each older person's health resources and try to minimize and limit what negatively affects vitality.

The result of the first sub-study can be mirrored in the definition of existential health by WHO: that one feels hope, community, and meaning in life, which permits a sense of belonging whether spiritual, religious or political in nature (WHO, 2002, in Melder, 2012). One can find existential health despite experiencing something that adversely affects vitality. Communion with others and meaning in life are the sources of hope that increase strength to live, and this stimulates vitality, the core substance of health (Lindholm et al., 2005).

8.2 Vitality and older workers

The specific research questions of the second and third sub-study were "What is giving vitality to older workers in health care to continue at work until retirement age and maybe even an extended working life" (sub-study 2) and "What kind of interventions have been made to support older employees' health and what effects do these interventions have on older employees' work ability?" (sub-study 3). To have work, where the inner will to help others is met, and where one is able to use one's knowledge, are internal health resources, that strengthen vitality for older workers in health care. Vitality is also strengthened by external health resources, such as meaningful work, where one experiences the benefits of working in a professional atmosphere with good colleagues and supporting leadership. Promoting health in the workplace gives the older worker strength to work until retirement age and maybe even after the official retirement age. Meaningful work that calls for the use of one's knowledge and gives the feeling of being needed and of value to the patients/clients, strengthens vitality. This is supported by an earlier study, Hammarström et al. (2021), who suggest that being employed gives health-promoting experiences by increasing self-confidence and being appreciated at work among others. Also, for younger people, paid work has been found important for health and gives a feeling of becoming someone.

Interventions that have been done for older workers are in the third sub-study, categorized into individual health checks and counselling, interventions based on screenings, and improvements in the work environment or organization, like management training. The results suggest that leadership training on how to support older workers is needed. Individual health counselling and support from supervisors seem to have a positive effect on health outcomes and increase work ability (Cloostermans et al., 2015; Koolhaas et al., 2010). Also, Oakman et al. (2018) suggest interventions in the workplace might improve work ability. Measurement and health screenings, like health checks, include good ways to compile follow-ups on employees' work ability and health status, and interventions may be created based on the results (Costa et al., 2011). Screenings aim to find disease and risk factors for disease to reduce morbidity and mortality (Krogsbøll et al., 2012).

Good leadership can strengthen an older worker's health resources by considering the working environment, utilizing the knowledge of the older workforce, and promoting the feeling of belonging to and being a part of a whole. These findings are also made by an earlier study about the quality of the work community and workers' intention to retire (Neupane et al., 2022) which

suggests that the intention to retire is affected by the quality of the work community. Also, low equality and low flexibility at work are associated with retirement plans (Neupane et al., 2022).

Good relations with colleagues and a supportive manager promote the continuation of work amongst older workers. Low social support and a poor team climate may result in mental health problems and future work disability pensions (Sinokki, 2011). Dufva (2012) states that challenging work tasks, a supportive work atmosphere, and good leadership, among other things, promote the continuation of older workers in working life. On the other hand, there are workers in manual work fields and workers who experience low vitality and high fatigue and may suffer from extended working life. Interventions to improve vitality, flexible work arrangements and a supportive organizational atmosphere may improve work ability (Vanajan et al., 2021). Older workers may prefer early retirement because of lower vitality caused by sleep and psychological disorders (Vanajan et al., 2020). Previous research shows that poor personal health, low work satisfaction, high physical workload, and lower work ability affect when a person retires (Virtanen et al., 2017, Vanajan et al., 2020). Employers should therefore offer training, different work adaption models, and more flexibility for older workers. It is recommended that occupational health care and HR departments implement interventions, such as work ability meetings, and health campaigns, which support employees' work ability.

The result shows how important experiencing being part of a community is for one's vitality. After retirement, work-related and meaningful activities, like work and volunteer work provide sources of vitality. By helping other people, older persons help themselves to be physically and mentally active. Nyström (2014) states that through sharing chaos and suffering with another person, the human being can once again get in touch with his or her real health and vitality. Vitality consists of feeling valuable and needed and being able to live based on what makes sense (Mäkelä & Lindholm, 2006). The result supports previous studies that what gives life meaning strengthens human vitality (Lindholm, 1998, Fagerström, 2010).

The result may be mirrored in the work ability house (Ilmarinen, 2009, 2019). The first floor consists of health and the ability to function, and the second floor consists of professional competence. The third floor consists of values, attitudes and motivation, work and working conditions, and the fourth floor contains the work community, the organization, managerial work, and leadership. According to this model, the individual's work ability is also affected by occupational health care, family, relatives, and friends. In this thesis, it has been found that there is

vitality in humans. Vitality is the essence of health. What affects vitality exists both inside and outside of the human. As seen from the work ability house model, the result in this thesis means that the floors affect each other, the first floor affects the second and so on. The person's values and will to use knowledge and skills and the fact that it is possible to realize them at work is important for health and vitality. The opportunity to realize oneself and to feel useful strengthens vitality. An older worker may eventually be physically tired, but the inner existential health and experience of vitality give them the strength to continue working. The employer should be aware of how it can support older workers and focus more on how the meaningfulness of work can be supported by the organization and how the mental work environment and supportive organizational culture can be promoted. This is supported by another study about work motivation and occupational self-efficacy belief to continue working among ageing home care nurses: a mixed-methods study (Wallin, et al., 2022). They state that the results from the studied group show that the most important factors of work motivation are the meaningfulness of work, job satisfaction, social support, and work environment and organizational characteristics.

According to the results of this thesis, it can be concluded that meaningful work is likely to prolong a working career. Therefore, it should be investigated which tasks, roles and/or areas of responsibility in the workplace feel meaningful to the older worker. The work may be transformed and made more appropriate for the older workers' situations and work ability. New tasks or updated job descriptions and their impact on work ability and vitality need to be followed up by occupational health and management. It is recommended that employers work in close cooperation with occupational health and safety when promotive and preventive measures are developed. An optimal situation is that work promotes the older worker's vitality and thereby their health can be strengthened. External factors like work environment, economic benefits and other kinds of support from colleagues and supervisors also strengthen the vitality and the will to work until retirement and even after the achieved retirement age.

8.3 Future direction for promoting vitality

Health is defined as something more than the absence of disease and this is important for leaders to keep in mind when creating health promotions in the workplace (Torp, 2013). Also, Fagerström (2021) claims that health can be experienced despite illness, and health promotive work supports this starting point. Even if one is struggling with diseases, there might be a will to continue at

work if one's deeper needs and desires are met. Work affects health positively by giving meaning and context to the life. A salutogenic approach, that focuses on factors that support health and wellbeing, is needed in health care. This approach affects health positively and gives wellness and a sense of coherence, as a complement to the pathogenic approach (Fagerström, 2021). In occupational health care, it is valuable to focus on the worker's resources and capacity and for the employee and the supervisor to adjust the work when needed. The salutogenic model in health promotion should be a natural perspective. The courage to live and the meaningfulness of life are strengthened if a person feels appreciation and love in the community.

There is a labour shortage in many areas and especially in healthcare which has caused serious concern about who will take care of patients in the future. Having older workers with knowledge and experience to continue working, offers benefits to both society and the individual. As stated in the introduction, worse work ability for workers and taking retirement pension early results in high costs for employers and states and results in insufficient labour force figures (Finnish Centre for Pensions, 2020). The optimal situation for a person in working age would be that the work itself and its meaningfulness are a source of vitality. If work can satisfy a person's need for appreciation and meaning, then there seems to be a will to work. Older persons who find sources of vitality may achieve inner peace despite declining health, illnesses and suffering. Important values are achieved when one is needed by another and there is a feeling of belonging to a community both in the workplace and in one's private life.

8.4 Methodological considerations

The credibility of the thesis is examined based on the criteria regarding validity, reliability and transferability (Graneheim & Lundman, 2004, Graneheim et al., 2017). According to Graneheim & Lundman (2004) all decisions, choice of context and perspective, material and method affect credibility. Credibility means that the result should convince the reader that the result is reasonable (Henricson, 2012).

The results of the sub-studies in this thesis were discussed with other researchers at every stage of the analysis process, and the preunderstanding was considered. One could also let informants assess how consistent the interpretation is with their experiences or provide them with an opportunity to read the transcripts of the interviews (Henricson, 2012; Farrelly, 2013). In this thesis, this stage was not done with the respondents and therefore could have

led to some small changes in the interpretation of the material in the first and second sub-studies.

The second sub-study, the interview study with older workers in health care, is highly topical when there is a shortage of nurses and many of the nurses are approaching retirement. Interviews with older workers from different field could have given different results. The interviews were analysed with qualitative content analysis (Graneheim & Lundman, 2004). The material could have been even broader and administrative personnel and nurses could have been separated, although many ward nurses also participate in the clinical work. Meaning units and categories were discussed with supervisors to seek agreement and to discuss any other points of view. The sub-studies are made reliably and confidentially, as described in the methodological section.

The data analysis, material, and time of collection of materials are described in the three sub-studies and summarized in this thesis. If the studies were repeated today, there would probably be similar results, however, the respondents in the sub-studies would rarely respond in the same way again. New research is constantly arising that affects the research process in a review study. A slightly different choice of items in the third sub-study could have resulted in something else, but during the current study, these articles were the ones that responded to the keywords. Scoping reviews about intervention studies give a good overview of what has been researched and what is missing. In the third sub-study, the scoping review was used by Arksey and O'Malley (2005) and summarized by the Joanna Briggs Institute (Peters et al., 2015). The small number of articles related to intervention studies for older workers showed the current knowledge gap, whilst at the same time, highlighting the relevant existing studies.

When considering transferability and the extent to which the results of the study also apply to other environments and groups, the sub-studies of vitality in this thesis are considered to be older people at the end of their careers and after retirement. The strength of the first sub-study is that there is a large sample from different countries, with different languages and cultures. In the articles which are included in this thesis, there are more accurate explanations of the strengths and limitations of the three studies. The first sub-study was done several years ago. The material was large, and more than 2500 answers were analysed. Content analysis was a suitable method because the purpose was to make an inductive thematization. Deeper analyses could not be done because the answers in the questionnaire were quite short.

The research question affects credibility because it depends on how the data analysis and research processes answer the research question. The total material in this thesis was large and different methods have been used. In this thesis, the stages of the data analysis are tried to interpret the material as accurately as possible.

Hermeneutics is the classical discipline that deals with the art of understanding texts (Gadamer, 1997). In this thesis, survey responses and interview material were interpreted according to qualitative content analysis. A hermeneutic approach was also used in the compilation of the results from the sub-studies. The interpretation was made as carefully as possible with ethical research procedures and awareness of the preunderstanding.

The result of this thesis reveals an understanding of how the vitality of the older person can be supported. Occupational health personnel and management in workplaces can support the older worker's vitality. The thesis also provides health sciences with additional knowledge about vitality.

9. Conclusions and implications

According to the results of this study, it can be concluded that meaningful work is likely to prolong a working career. Meaningful activities that give life content, and meaningful work, where one has opportunities to use one's knowledge and skills, strengthen the vitality of the older person and worker. When thinking about how the results from the thesis can be applied, one should remember that in certain countries, the latest trend is to increase the retirement age. To achieve the goals, actions that promote work ability are needed. To support a longer working life, occupational health and the employer need to follow up on sick leave and give early support to maintain work ability for workers who have reduced work ability. An individual care plan and support for workers when returning to work after a long sick leave absence is also necessary. Occupational health, which can support and influence both on an individual and an organizational level, has a unique role in supporting workers' vitality and well-being in the workplace. Cooperation between the employer and occupational health is required to see results in wellbeing and work ability.

The results of articles concerning interventions for older workers show that a knowledge gap exists, because of the small number of articles. This indicates that more research is needed to fill this gap and research should also target younger workers. Training for leaders has significance when it comes to creating well-being in the workplace and well-being for workers. Leaders need to consider different stages of life, of which the older workers' working period is one. Employers could adapt the work according to the needs and wishes of the older workers, but how this could be done would need more research. Conditions in the workplace, such as tasks and the employer's attitude, also affect workers' opportunities for extending their working life. Research on how the nurse's working lives can be extended is highly topical due to the shortage of personnel in health care. From the second sub-study, there are some unanalysed interview answers on how employers and occupational health care can support older workers in health care, and this research material will be analysed in a new study in the future.

Research about vitality also serves the caring science theory and health research. Vitality is a part of health. The results can serve promotive and preventive health care in occupational health and elderly care. "Health promotion is the process of enabling people to increase control over and to improve their health." (Nutbeam & Kickbusch, 1998). There is a need to consider the factors that increase vitality in older persons, at work and when retired. Prevention is about contributing to

various things so that something does not happen. The goal is to avoid accidents and illnesses. Knowledge is needed about risk factors and how they can be eliminated. Factors that affect vitality negatively should be considered in preventive health care, and factors that strengthen vitality should be invested in.

10. Sammanfattning

Livskraft, hälsa och arbete- Äldre personers livskraftkällor

Introduktion

Idag är målet i många länder att höja pensionsåldern. Bristen på arbetskraft inom många områden blir större samtidigt som människans förväntade livslängd ökar. Därför behövs kunskap om hur man kan stödja äldre arbetstagare att orka i arbetslivet. Mellan år 2010 och 2030 kommer äldre arbetstagare att öka i EU. Därmed blir medelåldern på arbetskraften högre. Arbetstagarnas försämrade arbetsförmåga och tidiga pensioneringar resulterar i höga kostnader för arbetsgivare och staten samt leder till inadekvata arbetskraftssiffror (Finska pensionscentralen, 2020).

I de flesta EU länder är den officiella pensionsåldern 65 år. I många länder är pensionsåldern uppskattad i relation till den förväntade livslängden. I många EU länder har man som mål att höja den allmänna pensionsåldern och förebygga tidigt utträde från arbetslivet. För att garantera tillräckligt med arbetskraft i framtiden, bör arbetstagarna redan nu förlänga yrkeskarriären. Nedsatt arbetsförmåga och sjukpension (pension som beviljas om man varit arbetsoförmögen minst ett år p.g.a. sjukdom, skada eller handikapp men inte uppnått sin pensionsålder) utgör stora utgifter för samhället. Dessutom inverkar en försämrad arbetshälsa på människans eget välmående och välfärd i och med det lidande som sjukdomar medför samt en minskad inkomst. Största orsaken till sjukpension i Finland är psykiska sjukdomar och beteendestörningar, 33%. Problem i stöd- och rörelseorgan är näststörsta orsaken till sjukpension (32%). Mentala problemens andel har varit störst sen år 2000 (Pensionsskyddscentralen, 2022). I Finland har pensionsåldern stigit på grund av pensionsreformen (2017) och det har också skett en minskning av nya sjukpensioners antal. Finländarna gick i arbetspension ett halvt år senare år 2021 än år 2020 (Pensionsskyddscentralen, 2022). Befolkningens stigande ålder och samtidig brist på arbetskraft inom hälso-och sjukvården är ett växande problem. Samtidigt åldras också vårdpersonalen. Enligt Världshälsoorganisationen, WHO, behövs det omkring 40 miljoner nya arbeten inom hälso-sjukvården fram till år 2030. Även om denna tillväxt uppfylls kommer det att saknas 18 miljoner personer inom hälso-och sjukvård för att uppnå FN:s globala mål för hållbar utveckling särskilt i låg-och lägre medelinkomstländer (World Health Organization. Health Workforce – Data and statistics, 2022).

För att minska på problem med brist på arbetskraft har det gjorts många pensionsreformer med avsikt att förlänga arbetslivet i förhållande till uppskattad livslängd. Även om det har skett positiva förändringar finns det behov av att fokusera på äldre arbetstagares arbetsförmåga, och hur de kan fortsätta att arbeta till pension och kanske även efter uppnådd pensionsålder. I Finland är servicen som företagshälsovården erbjuder fastslagen i lagen (Finlex 1383/2001). Syftet med denna lag är att främja arbetstagarnas arbets-och funktionsförmåga. Detta blir en allt viktigare uppgift eftersom den arbetsföra befolkningens ålder stiger. Företagshälsovård bygger på en lång tradition i Finland, den första lagen föreskrev denna service och bekräftades 1978 och uppdaterad 2001 (Ilmarinen, 2005).

Syftet med lagen är att arbetsgivaren, arbetstagarna och företagshälsovården tillsammans främjar 1) förebyggandet av sjukdomar och olycksfall i anslutning till eller som följd av arbetet, 2) hälsa och säkerhet i arbetet och arbetsmiljön, 3) arbetstagarnas hälsa och arbets- och funktionsförmåga i olika arbetslivsskeden, samt 4) verksamheten bland de anställda (Finlex/Ministry of Social Affairs and Health). Institutet för arbetshygien har gjort omfattande undersökningar om den åldrande arbetstagarens arbetsförmåga. Arbetsförmåga är en balansgång mellan personliga resurser och arbetet, även familjen och närstående inverkar på denna balansgång. Hälsosamma levnadsvanor och intressen stärker hälsan och funktionsförmågan (Ilmarinen, 2006). Det som däremot ännu är relativt outforskat är vad som ger livskraft för den äldre arbetstagaren att fortsätta i arbetslivet.

Denna avhandling görs ur ett caritativt vårdteoretiskt perspektiv. De vårdvetenskapliga utgångspunkterna för forskningen finns i kärnbegreppen hälsa och livskraft. Denna doktorsavhandlings syfte är att få en ny förståelse om äldre personers livskraft generellt och i arbetslivet och att utforska vad som ger den äldre arbetstagaren livskraft att fortsätta arbeta och hur deras livskraft kan stödjas. Avhandlingen ämnar berika den kliniskt tillämpade forskningen inom vårdvetenskapen. Genom att klargöra vad som stöder livskraften för den äldres arbetstagaren kan man stödja människan på individnivå, samtidigt som kunskapen kan gagna arbetsgivare och samhället. Avhandlingen består av tre publicerade artiklar. Den första artikeln beskriver vad som inverkar positivt och negativt på livskraften för den äldre människan (65- och 75-åringar). Den andra artikeln beskriver vad som ger livskraft för den äldre arbetstagaren (> 60 år) att fortsätta arbeta. Den tredje artikeln redogör för vilka interventioner som blivit gjorda på arbetsplatser för att stödja äldre arbetstagares hälsa och vilka effekter dessa interventioner haft på den äldre arbetstagarens arbetsförmåga.

Systematisk databassökning om livskraft inleddes i samband med första delstudien och därefter har sökningen gjorts flera gånger under åren 2016 - 2021. Sökningen är begränsad till år 2006 - 2022. Sökorden härrör sig till vitality, health, work ability, older worker, intervention, occupational health (livskraft, hälsa, arbetsförmåga, äldre arbetstagare, intervention, företagshälsovård).

Arbetsförmågan beskrivs som en balans mellan människans personliga resurser och arbetet. Dessa resurser består av hälsa och funktionella förmågor (fysiska, psykiska, sociala), utbildning, kompetens, värderingar, attityder och motivation. Arbetsförmågan är resultatet när individuella faktorer sätts i relation till arbetskrav (fysiska och psykiska), arbetsgemenskapen och organisationen samt arbetsmiljön (Ilmarinen, 2001, 2012). Arbetsförmågan kan bli utvärderad t.ex. via arbetsförmågeindex, AFM, som är utvecklad i Finland i början på 1980 av forskare från arbetshälsoinstitutet (Ilmarinen, 2009).

Sammanfattning av tidigare forskning

Framför allt hälsa och arbetsförmåga, personliga motiv, stöd utifrån samt stöd från arbetsgivare och företagshälsovård inverkar på hur länge man fortsätter i arbetslivet. Enligt tidigare forskning framkommer fem teman på om man vill fortsätta; eget hälsotillstånd, sociala kontakter, utmaningar, kompetens och belöning. Fortsatt arbete för arbetstagare över 63 år görs bland annat tack vare god hälsa, professionellt kunnande, utmanande arbete, stödjande arbetsatmosfär och gott ledarskap. Pensionering är en individuell process, en process som sker stegvis (Dufva, 2012). Att arbeta efter pension har ofta icke finansiella orsaker, utan beror på att arbetet ger en mening i livet och sociala kontakter. Detta upprätthåller hälsa för äldre arbetstagare (Nemoto et al., 2020). Arbetsförmågan har den största betydelsen för pensionsplaner eller vilja att fortsätta arbeta för både män och kvinnor (Thorsen et al., 2013). För att förlänga arbetslivet och stödja äldre arbetstagare behövs interventioner genomföras både av företagshälsovården och arbetsgivaren. Tidigare forskning beskriver de yttre orsakerna, till exempel vissa stödåtgärder från företagshälsovården och arbetsgivarna i form av interventioner, planer och åtgärder för den äldre arbetstagaren, som inverkar på fortsättning i arbetslivet. Däremot finns det inte mycket forskning om vad som kan öka en äldre persons inre energi och livskraft.

Teoretiskt perspektiv

De teoretiska utgångspunkterna utgörs av den syn på hälsa och livskraft som utvecklats inom den caritativa vårdteorin (Bergbom et al., 2022). I denna teori ses hälsa som mer än frånvaro av sjukdom (Eriksson, 2007; Fagerström, 2010). Människan ses i grunden som en enhet av kropp, själ och ande. Vårdandet förstås

som ett mänskligt fenomen. Enligt denna teori är kärlek, barmhärtighet, mänsklighet, medkänsla och en vårdande relation de grundläggande principerna. Världshälsoorganisationen (WHO) introducerade definitionen av hälsa 1948 som ”ett tillstånd av fullständigt fysiskt, mentalt och socialt välbefinnande och inte bara frånvaron av sjukdom eller handikapp” (WHO, 2014). Denna avhandlings utgångspunkt är att hälsa ses ur ett holistiskt, flerdimensionellt perspektiv, där hälsa är mer än frånvaro av sjukdom. WHO har också direktiv för arbetshälsa och hälsosamt åldrande (WHO, 2020, 2021). Hälsa kan upplevas trots sjukdom, och det salutogena perspektivet betonar hälsa och hur man kan stödja hälsan (Fagerström, 2021). Livskraft är den innersta dimensionen av hälsa (Bergbom et al., 2022). Livskraft har beskrivits i den caritativa vårdteorin som hälsans kärnsubstans och essens, livskraften är en kraft av energi, glädje och lust till livet (Lindholm et al, 2021).

Syfte och frågeställningar

Det övergripande syftet med avhandlingen är att få en ny förståelse om äldre personers livskraft generellt och i arbetslivet och att utforska vad som ger den äldre arbetstagaren livskraft att fortsätta arbeta och hur livskraften kan stödjas. Ökad kunskap inom detta område kan ge experter inom företagshälsovård, arbetsgivare och ledare djupare förståelse som uppmärksammar de äldre arbetstagarna och en djupare förståelse för vad som påverkar deras hälsa och arbetsförmåga.

De specifika forskningsfrågorna i delstudierna var:

• Vad inverkar på den äldres livskraft? (delstudie 1)

• Vad ger den äldre arbetstagaren inom vården livskraft att fortsätta arbeta? (delstudie 2)

• Vilka interventioner har gjorts för att stödja äldre arbetstagares hälsa och vilka effekter har dessa på den äldre arbetstagarens arbetsförmåga? (delstudie 3)

Metoder

I delstudierna har olika design och metoder använts. Ett hermeneutiskt tillvägagångssätt användes för att sammanföra och sammanställa resultaten. Datamaterialet i första delstudien består av enkätsvar och den andra delstudien är en kvalitativ semistrukturerad intervjustudie. Båda delstudierna tolkades med induktiv kvalitativ innehållsanalys som metod. Den tredje delstudien är en scoping review. Alla studier berör äldre personer eller äldre arbetstagare, hälsa och livskraft.

Delstudie ett har genomförts bland hemmaboende äldre och beskriver vad som ger livskraft och vad som kan inverka på den positivt eller negativt. Studien bygger på en tvärsnittsstudie och har en beskrivande och explorativ design. I delstudien analyserades 2579 svar på två öppna frågor om livskraft. Ett omfattande frågeformulär skickades till 4927 äldre personer i åldrarna 65 och 75 i Finland och Sverige.

Den andra delstudien besvarar frågan om vad som ger den äldre arbetstagaren livskraft att fortsätta arbeta. Den kvalitativa intervjustudien gjordes inom hälso- och sjukvården och beskriver vad som ger livskraft till äldre arbetstagare att fortsätta arbeta fram till pensionsåldern och kanske även förlänga sitt arbetsliv. Totalt 15 personer i åldern 59 - 65 år deltog i studien. Vid analysen av de första och andra delstudierna användes kvalitativ innehållsanalys

Delstudie tre ger svar på vilka interventioner som har gjorts för att bibehålla den äldre arbetstagarens hälsa och vilka effekter dessa interventioner har på den äldre arbetstagarens arbetsförmåga. En scoping review fokuserar på att ge en översikt över forskningslandskapet och den presenterar resultat och identifierar luckor i forskningen (Arksey & O'Malley, 2005). Studien fokuserar på vetenskapliga artiklar publicerade 2007 - 2019, i syfte att svara på följande frågor: 1) Vilken typ av interventioner har gjorts för att stödja äldre arbetstagares hälsa? 2) Vilka effekter har dessa interventioner på äldre arbetstagares arbetsförmåga? Totalt hittades 8 artiklar som uppfyllde inklusions- och exklusionskriterierna. De flesta deltagarna var mellan 50 - 55 år.

Resultat

Resultaten från de olika delstudierna presenteras i tabellen nedan. I den första delstudien presenteras svaren på vad som inverkar på den äldres livskraft positivt och negativt, andra delstudien svarar på vad som ger den äldre arbetstagaren inom vården livskraft att fortsätta arbeta. Tredje delstudien beskriver vilka interventioner har gjorts på arbetsplatsen för att stödja äldre arbetstagares hälsa och vilka är resultaten av dessa på arbetsförmågan.

Tabell 8. Sammanfattning av resultaten av delstudierna I-III

Delstudie	**I**	**II**	**III**
Forskningsfråga	Vad inverkar på den äldre människans livskraft?	Vad ger den äldre arbetstagaren inom hälso-och sjukvården livskraft att fortsätta arbeta?	Vilka interventioner har blivit gjorda på arbetsplatsen för att stödja äldre arbetstagares hälsa och vilka effekter har dessa interventioner på den äldre arbetstagarens arbetsförmåga?
Resultat	En trygg och bekräftande gemenskap, meningsfulla aktiviteter, ett optimalt hälsotillstånd och inre styrka är källor till livskraft. Ett begränsat liv, händelser i världen och i närmiljön som hotar den inre meningsfullheten och bördor som ger upphov till en känsla av hopplöshet eller depression hämmar livskraften.	Det som ger livskraft att fortsätta beror både på inre och yttre resurser. Inre hälsoresurser: livskraften påverkas av möjlighet att använda sina kunskaper, personliga värderingar och egen hälsa. Yttre hälsoresurser: ett meningsfullt arbete, relationer, arbetsgemenskap, arbetsvillkor och förmåner främjar livskraften.	Tre kategorier framkom: individuella hälsokontroller och rådgivning, mätningar och screening samt förbättringar i arbetsmiljön eller organisationen. Resultat visade att: minskade hälsorisker kan uppnås genom individuell hälsorådgivning. Mätningar och screeningar är bra sätt att kartlägga arbetstagares hälsotillstånd och arbetsförmåga. Ledarskapsutbildning och stöd från ledare visade positiv effekt på hälsa och arbetsförmåga.

I den första delstudien framkom att viktiga källor till livskraft är en trygg och bekräftande gemenskap, meningsfulla aktiviteter, ett optimalt hälsotillstånd och inre styrka. Det som hämmar livskraften är händelser i världen och i ens närmiljö som hotar inre meningsfullhet. Även bördor som ger upphov till känsla av hopplöshet eller depression samt sjukdom och ett begränsat liv hämmar den äldres livskraft. Deltagarna i första studien ansåg att det som inverkar positivt på livskraften är barn (50.7%), barnbarn (46.5%) partner (36.9%), intressen (20.5%), vänner (19.6%) och hälsa (18.5%). En trygg och bekräftande gemenskap samt den närmaste familjen är källor till livskraft. Känslan av att få

dela både glädje och sorg och att ha någon att hjälpa och att få hjälpa är viktigt i gemenskapen. Delande och stöd karakteriserar dessa relationer. Möjlighet att åldras med sin partner och att finnas till för barn och barnbarn gav deltagarna styrka. Förutom att ha en familj som bryr sig om en så är det minst lika viktigt att känna sig behövd och hjälpa till när familjen behöver hjälp. Relationer som bygger på ömsesidigt delande och gemenskap är en källa till livskraft.

Arbetsrelaterade aktiviteter i form av arbete och frivilligt arbete och behovet av att vara behövd och ha meningsfulla aktiviteter är också källor till livskraft för den äldre. Arbete ger mening och innehåll i vardagen. Arbete i denna åldersgrupp är ofta frivilligt och i form av obetalt arbete men ger trots detta en känsla av att vara behövd. Känslan av att vara nyttig och ha en roll är viktigare än lön. Genom att hjälpa andra personer hjälper de sig själva att vara fysiskt och psykiskt aktiva. Många deltagare nämnde att intressen som handarbete, vävning, god mat och dryck, kyrkligt liv, medlemskap i klubb eller förening samt lopptorg är faktorer som inverkar positivt på deras livskraft.

Enligt deltagarna i studien är sjukdom den mest vanliga orsaken (23.9%) som inverkar negativt på livskraften, följda av händelser i världen och i närmiljö (12.7%), ogynnsamma boendeförhållanden (9.5%) och familjeproblem (7.4%). Reducerande faktorer på livskraften är åldrande som innebär sjukdom och ett begränsat liv, kriser i världen eller i ens närmiljö, sådant som hotar den inre meningsfullheten och orsakar känsla av hopplöshet eller depression. Åldrande som innehåller illamående och begränsat liv i relation till fysiska faktorer och sämre fysisk hälsa inverkar mest negativt på livskraft.

I resultaten från den andra delstudien, med fokus på vad som ger äldre arbetstagare livskraft att fortsätta arbeta, framkom att både inre och yttre hälsoresurser påverkar livskraften. Inre hälsoresurser som påverka livskraften är möjligheter att använda sina kunskaper och färdigheter, personliga värderingar och den egna hälsan. Yttre hälsoresurser som främjar livskraft är ett meningsfullt arbete, relationer och arbetsgemenskap och arbetsmiljö samt förmåner.

Några individuella faktorer som ger livskraft att fortsätta i arbetet är värderingar och attityder. I svaren framkom att öppenhet och en positiv attityd till livet ger den styrka som behövs för att fortsätta arbeta. Friheten att själv bestämma om man vill fortsätta arbeta upplevs som positivt av de som uppnått sin pensionsålder. Informanterna påpekade att möjlighet att använda sin erfarenhet och samtidigt lära sig något nytt ger livskraft för att orka fortsätta arbeta. De

ansåg att om deras kunskaper inte används känns det som den kompetens de besitter inte utnyttjas.

Informanterna konstaterade att ett meningsfullt arbete, att känna sig nyttig och behövd ger livskraft att orka arbeta. Att hjälpa andra ger en känsla av tillfredställelse. Äldre arbetstagare inom vården ansåg att arbetet ger mening i livet p.g.a. dess innehåll. Många av informanterna nämnde att ett liv utan arbete skulle kännas tomt. De kände att de får bekräftelse av sitt arbete genom att se nöjda patienter, och deras arbetsinsats har betydelse. De ansåg att det är viktigt att man har ett intressant arbete som man är förbunden till, att få se och lära sig nytt samt att få ta del av nya forskningsresultat. Nya arbetsuppgifter och utmaningar stöder viljan att fortsätta arbeta.

Informanterna betonade att goda relationer och en känsla av att vara en del av arbetsgemenskapen inverkar positivt på livskraften. Att ha roligt med kollegor och att se resultat av teamarbete stärker samhörighet och arbetsgemenskapen. En del kunde dela både sorg och glädje med kolleger. Feedback från patienter, kolleger och förmän är viktig, det ger en känsla av att vara nödvändig och värdefull och att man har en roll i sitt team. Rutiner och en rytm i arbetsdagen erfars som positiva. Arbetsmiljön, förmåner, ett gott ledarskap, en rättvis förman, introduktion i uppgifter och någon som har tid att ge stöd när det behövs inverkar på hur länge man vill fortsätta i arbetet. En god arbetsmiljö och öppen kommunikation på arbetsplatsen stöder den äldres arbetsförmåga.

Den tredje delstudien undersökte vilka inventioner som gjorts för att stödja äldre arbetstagares hälsa och vilka effekter dessa interventioner har haft för den äldre arbetstagares arbetsförmåga. Tre huvudkategorier framkom ur denna scoping review. Hälsokontroller och rådgivning för arbetstagare på en individuell nivå kan stödja äldre arbetstagares arbetsförmåga. Hälsokampanjer som fokuserar på hälsa och arbetsförmåga för äldre arbetstagare kan vara kostsamma men tidig pension till följd av dålig arbetsförmåga är ännu dyrare och är ofta ett resultat av arbetstagarens lidande, värk och psykisk ohälsa.

De fortgående uppföljningarna av arbetstagarnas arbetsförmåga genom mätningar och screening förser företagshälsovården med information genom vilka man kan förutse risker för tidig pension och i studien framkom att hälsorådgivning kan minska hälsorisker. Det tar dock tid innan det är möjlighet att utvärdera fördelar av rådgivningen och därför krävs det att deltagarna förbundit sig att delta i interventionerna.

Interventioner baserade på mätningar och undersökningar visade sig också stödja arbetstagarens arbetsförmåga. Mätningar och screening är ett bra sätt att uppfölja arbetstagares arbetsförmåga och hälsostatus, en plan efter att resultaten är analyserade är ändå nödvändig, annars går viktigt data om intet. Interventioner baserade på screening fanns i tre studier. AFM (arbetsförmågeindexet) är ett instrument som används i den kliniska företagshälsovården för att bedöma arbetsförmåga i samband med hälsokontroller och arbetsplatsbesök och inom forskning (Ilmarinen, 2005).

Ledarutbildning och stöd från förmän påvisade positiv effekt på hälsa och arbetsförmåga. I tre studier gjordes interventionerna för att förbättra arbetsmiljön eller organisationen som man undersökte. Att utbilda förmän var en intervention som användes för att förlänga personalens deltagande i arbetslivet. Stöd från kollegor, informella nätverk och förmän ansågs som positiva och skolning för ledare minskade stereotyper, team konflikter och ökade innovationer.

Enligt resultaten av delstudierna kan man dra slutsatsen att ett meningsfullt arbete sannolikt kommer att förlänga människors arbetskarriär. Meningsfulla aktiviteter som ger livet innehåll och ett meningsfullt arbete där man har möjligheter att använda sina kunskaper och färdigheter stärker den äldre arbetstagarens livskraft. För att stödja ett längre arbetsliv behöver företagshälsovården och arbetsgivaren följa upp sjukskrivningar och ge tidigt stöd för att upprätthålla arbetsförmågan för arbetstagare som har nedsatt arbetsförmåga. En individuell vårdplan och stöd för arbetstagaren vid återgång till arbetet efter en lång sjukskrivning är också nödvändigt. Företagshälsovården som kan påverka både på individ- och organisationsnivå har en unik roll i att stödja arbetstagarens livskraft och välbefinnande på arbetsplatsen. Samarbete mellan arbetsgivare och företagshälsovård krävs för att se resultat i välmående och arbetsförmåga. Resultaten av artiklar om interventioner för äldre arbetstagare visar att det finns en kunskapslucka på grund av den ringa mängden artiklar. Detta tyder på att det behövs mer forskning för att fylla denna lucka och forskning bör även rikta sig till yngre arbetstagare.

Ledarskapsutbildning har betydelse när det gäller att skapa välbefinnande på arbetsplatsen och välbefinnande för arbetstagare. Ledare bör också ta hänsyn till olika skeden i livet, varav de äldre arbetstagarnas arbetsperiod är ett skede. Förhållandena på arbetsplatsen, såsom arbetsuppgifter och arbetsgivarens attityd påverkar också arbetstagarnas möjligheter att förlänga arbetslivet. Forskning om hur vårdarnas arbetsliv kan förlängas är högaktuell på grund av den rådande bristen på personal. Forskning om livskraft berikar också

vårdvetenskapliga teorin och hälsoforskning. Resultaten kan utnyttjas i förebyggande hälsovård inom företagshälsovård och äldreomsorg. Faktorer som påverkar livskraften negativt och faktorer som stärker livskraften bör beaktas i promotiva och preventiva hälso-och sjukvården för äldre personer.

Nyckelord: livskraft, äldre arbetstagare, hälsointervention, arbetsförmåga, kvalitativt närmelsesätt, interventioner, scoping review, hälsovetenskap, vårdvetenskap, företagshälsovård

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Söderbacka, T., Nyström, L., & Fagerström, L. (2017). Older persons' experiences of what influences their vitality–a study of 65-and 75-year-olds in Finland and Sweden. *Scandinavian Journal of Caring Sciences*, *31*(2), 378-387.

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Older persons' experiences of what influences their vitality – a study of 65- and 75-year-olds in Finland and Sweden

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Older persons' experiences of what influences their vitality – a study of 65- and 75-year-olds in Finland and Sweden

Throughout the world, life expectancy has noticeably increased during the past decade, and health promotive initiatives for older persons will therefore become ever more important. During the past few years, interest in what constitutes the source of health for human beings has markedly increased in health science research. An interesting and relatively unresearched domain is what provides older persons the strength and energy to look forward and what positively or negatively influences older persons' vitality. The aim of the study was to explore and describe older persons' vitality and their subjective experiences of what influences their vitality, despite disease and suffering. The study has an explorative and descriptive design. A comprehensive questionnaire including two open-ended questions about vitality was sent to 4927 older persons aged 65 and 75, and a total of 2579 responded to the open-ended questions. Qualitative content analyses were used. A safe and confirming communion, meaningful activities, an optimal state of health and an inner strength were important sources of vitality. Ageing that includes illness or a restricted life, happenings in the world and in one's close environment that threaten inner meaningfulness, and mental burdens that give rise to a feeling of hopelessness or depression decrease vitality. Vitality is an important health resource for 65- and 75-year-olds in that it influences a person's longing for life, love and meaning. Accordingly, it is of fundamental importance that Registered Nurses and other healthcare personnel strengthen older persons' vitality during the ageing process. By taking into consideration that which positively vs. negatively affects the vitality of each unique person, healthcare personnel can strengthen each older person's health resources and attempt to minimise and limit what negatively influences said person's vitality.

Keywords: survey designs, qualitative approaches.

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Introduction

Throughout the world, life expectancy has noticeably improved, and during the past century, and a half average life expectancy in many industrial countries has increased from just below 50 years in 1861 to about 80 years today (1). As life expectancy increases, societies can expect a simultaneous increase in the need for care facilities, and health promotive and disease preventive initiatives for older persons will become ever more important. In health science research, interest in human beings' source of health has recently increased markedly, largely because of Antonovsky's salutogenic research on human beings' health resources and what might positively influence health, wellness and sense of coherence (2, 3). Recent research has shown that a person's attitude towards life (life orientation), such as positive thinking or positive disposition in relation to crises and life in general, positively effects his/her adaptability, achievements, recovery and need for care (4–6).

Vitality is considered the essence of health and can be described using the concepts 'life energy', 'inner strength' and 'inner health resource' (7–9). In care, it is possible to meet older persons with positive approaches to life: persons who because of their vitality defy adversity and have the strength to continue living, despite illness and suffering (9). However, it is also possible to meet older persons who struggle with both vitality and adversity. It is therefore important to understand how vitality among older persons can be strengthened and supported. That which provides the strength and energy to look forward and which can positively or negatively influence older persons' vitality is a relatively unresearched domain (9).

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More knowledge is needed to ensure that carers are capable of strengthening older persons' experiences of health and supporting their capacities to live independent lives.

In Finland, the Finnish word *sisu* is used to express a fundamental, psychological competence that enables extraordinary action and empowers individuals to overcome a physically or mentally challenging situation (10). The word can be translated into English as will, determination, perseverance or rational action in the face of adversity and as such can be understood as an expression of vitality.

Expressions of vitality as a research domain were investigated in a multidisciplinary Nordic research project, the Gerontological Regional Database (GERDA) project, where the main purpose was to develop knowledge of 'good ageing' (11). Our aim with this actual study was to expand knowledge of older persons' vitality and their subjective experiences of what influences their vitality. One assumption is that older persons, who have a long life behind them, can possess knowledge of the importance of vitality and the central sources of vitality.

Literature review

Vitality is a relatively unresearched phenomenon when considered from a health science perspective. Based on a database search using the search word 'vitality', we ascertained that an unambiguous definition of the term does not exist. Our database search yielded publications on traditional Chinese philosophy and the tradition of yoga (12). Also, concepts such as spirituality, mindfulness, personal and inner development, astrology and holism were seen, representing additional concepts that describe existential and transcendental expressions used in the literature and research as synonyms for vitality. Various forms of culture, such as music, the visual arts, poetry or film, can also be understood as expressions of and/or sources of vitality (9). Closely related concepts include life, energy, health and positive life orientation, and their importance is especially seen when they are activated during disease/illness, crises or suffering (6, 8, 9, 13).

In Eriksson's caring theory, vitality is described as a profound longing and the innermost movement, which gives rise to an experience of desire/lust and suffering (7). Eriksson maintains that a human being's vitality and courage to face life is hidden in his/her experience of dignity and own holiness. To experience this holiness, a human being must be in contact with his/her innermost essence, spirituality and religiousness. 'Becoming' in health and suffering presupposes that a human being has the strength and courage for reconciliation and renewal (14).

According to Tillich (15; a philosophical theologian), a person's longing for life, love and meaning constitutes a fundamental ontological longing. This longing is expressed as a deep desire for communion and meaningfulness in life and also as an existential anxiety about death, lovelessness and meaninglessness. Tillich (15) also maintains that human beings continuously strive to fulfil these deep desires. To be a person entails, consequently, to long for and strive towards life, love and meaning and not allow one's inner anxiety over 'not being' to constitute a threat, that is to say to not allow anxiety related to guilt and condemnation, emptiness and meaninglessness or fate and death to take over. The longing for life, love and meaning as well as how such has been fulfilled influences a person's vitality (7, 9).

A person's life energy and life strength are tied to death (3, 13). Death influences and shapes life, and death as an end point gives contentment. One supposition is that the sources that can fulfil a person's longing for life, love and meaning, both in his/her own life and environment, become important health resources that give vitality (9). That which gives life meaning strengthens a person's vitality (13). A person's vitality, subsequently, is tangential to profound existential questions about life, love and meaning and the experience of health as an entity, harmony and well-being. To be able to live a meaningful life in communion gives zest for life and vitality, allowing the strength to be able to positively look ahead to emerge.

In recent research, there is a clear link between positive life orientation, older persons' need for healthcare services and mortality (6). Positive life orientation can thus be understood as a health resource, and vitality is assumed to be a fundamental condition for a positive basic attitude in life (8–10). To be capable of focusing on the lighter side of a situation and shape reality from this can be seen as an expression of positive life orientation (cf. 5). In another study, researchers found that communion with others and a feeling of meaningfulness gave patients vitality, and vitality emerged as the innermost substance of health and health's innermost movement (16). In a study by Strandmark (17), vitality emerged as a balance between self-image and own worth, ability to recover and zest for life. Spirituality can bolster vitality in that it gives a sense of security and transcendence.

Those sources that in a person's own life or environment fulfil his/her most profound needs, that is, longings, can become important health resources (8–10, 13). Vitality is thus comprised not only of a person's own strength and inner resources but also external health resources that exist in his/her surroundings. These sources of strength, which act as health resources, even contribute

to a person being able to meet adversity in life with a positive life orientation.

Aim

The aim of the study was to explore and describe older persons' vitality and their subjective experiences of what influences their vitality.

Methods

Study design

The study has a descriptive and exploratory design and took the form of a cross-sectional survey.

Setting, participants and data collection

This study was a part of the GERDA research project, which was carried out in September and November 2005 in Finland and Sweden. In our study, we focused on persons aged 65 and 75, born in 1930 and 1940, respectively, residing in Ostrobothnia, Finland (18 municipalities/173 000 inhabitants), or Västerbotten, Sweden (15 municipalities/255 000 inhabitants). While the two regions included in the study share several common structural features, including cultural characteristics and historical bonds, noticeable differences do exist between the regions such as differing linguistic conditions (18).

The study's total sample consisted of all persons aged 65 and 75 residing in less populous municipalities. The study's random sample consisted of every second inhabitant in the most populous town in Ostrobothnia and every third inhabitant residing in the two most populous towns in Västerbotten. The Finnish and Swedish governments' civil registry lists were used to conduct the randomisation. A comprehensive questionnaire, developed by the GERDA project's multidisciplinary research group and pilot-tested before use (11), was used. The questionnaire included 84 questions (15 pages) about general health, health problems and living conditions and two open-ended questions on vitality: 'Name a few things that give you vitality' and 'Name a few things that negatively influence your vitality'. In total, we sent out 4927 questionnaires along with a follow-up questionnaire after 4 weeks, and after reminders, we obtained a total response rate of 68.4% (n = 3370). From the 3370 responses received, there were 2579 responses (76.5% of the received responses; 57.3% women and 42.7% men) to the two open-ended questions on vitality, which were investigated in this study. Three language groups were seen in the sample: two from Finland (Finnish-speaking Finns, 17.7%; Swedish-speaking Finns, 27.4%) and one from Sweden (Swedish-speaking Swedes, 54.9%). With regard to participants' marital status, 73% were married or had a partner, 6.6% were divorced, 4.6% were single, and 15.3% were widowed.

Data analysis

The methods used for data analysis included qualitative manifest content analysis and, because of the large amount of data, initial quantitative analysis of the questionnaire responses (19). The manifest content analysis was inspired by Graneheim and Lundman (20). In the first step, we transcribed and complied all answers into one document (about 80 pages). In the second step, we read through all answers and coded those answers with similar content. We then quantitatively counted all answers given a code. In the third step, we carefully read through all sentences that described the codes given in step two. Emanating from our understanding of the meaning-bearing content, we sorted the codes into subcategories based on similarities and dissimilarities in content (See Tables 1 and 2) and also calculated the subcategories quantitatively. We sorted those subcategories pertaining to the same phenomenon into categories: participants' subjective experiences of what positively or negatively influences their vitality (See Figs 1 and 2). In the fourth step, we developed those categories with similar content into themes (See Fig. 3).

Ethical considerations

The regional committees for medical and health research ethics in Ostrobothnia, Finland, and Västerbotten, Sweden, granted ethical approval for the study. In the study, we adhered to standard research ethical principles (21). By answering the questionnaire, the participants gave their informed consent to participate in the study. We

Table 1 Factors that positively influenced vitality

	n	%
Children	1308	50.7
Grandchildren	1199	46.5
Partner	952	36.9
Interests	529	20.5
Friends	505	19.6
Health (lack of illness)	478	18.5
Religion	381	14.8
Mental resources	341	13.2
Nature	246	9.5
Family	171	6.6
Home	98	3.8
Financial security	52	2.0
Work	43	1.7
Physical functional ability	20	0.8
Other	47	1.8

Table 2 Factors that negatively influenced vitality

	n	%
Illness	616	23.9
Happenings in the world and close environment	328	12.7
Adverse living conditions	246	9.5
Family problems	190	7.4
Pain	143	5.5
Diminished physical health	126	4.9
Life crisis/conflicts	101	3.9
Ageing	79	3.1
Worry	69	2.7
Loneliness	64	2.5
Diminished mental health	49	1.9
Vision	24	0.9
Hearing	18	0.7
Other	74	2.9

guaranteed anonymity and protection of identity in the cover letter sent out with the survey.

Results

The qualitative analysis of the responses yielded 15 factors (seen as subcategories) that positively influenced participants' strength to live, that is, factors that positively influenced vitality (See Table 1). Participants mentioned children (50.7%), grandchildren (46.5%) or partner (36.9%) in about half of the open-ended answers. Participants mentioned interests (20.5%), friends (19.6%) or health (18.5%) in about one-fifth of the open-ended answers. We analysed and sorted the positive subcategories into categories and then sorted the categories into four themes (A1–A4; See Fig. 3).

The factors that negatively influenced participants' strength to live were sorted into 14 subcategories (See Table 2). Participants mentioned illness (23.9%) most often as the factor negatively influencing vitality, followed by happenings in the world and close environment (12.7%), adverse living conditions (9.5%) and family problems (7.4%). We analysed and sorted the negative subcategories into categories and then sorted the categories into three themes (B1–B3; See Fig. 3).

A safe and confirming communion

Participants frequently described care (solicitude) for their closest family members as a source of vitality. The participants considered children and grandchildren to be positive sources of strength. Many responses referred to a partner (husband/wife) or other family members as sources of vitality, for example 'To be able to grow old with [my] wife, to be there, when children and grandchildren come to visit'.

Participants mentioned the experience of personal communion with family and friends as also being important, and this gave the participants the strength to continue living. The reasons given for why family gave the strength to live included that participants could share both sorrow and joy and that there was someone to help and who cared. Intimacy, sharing and support characterised these relationships. To be able to grow old with one's partner and be there for one's children and grandchildren gave participants strength. In addition to family who care, it was at least equally important for participants to feel useful and to help their family when help was needed: 'I feel that I am needed for my husband, children, grandchildren and my 91-year-old mother who is still alive'. Those relationships that were built on mutual sharing and communion were a source of strength. A person receives confirmation through relationships and through the 'meeting' with an other, where both giving and taking occur. Relationships can also contain love as a source of strength: the reciprocation of to love and be loved.

Meaningful activities that give life content

Participants described work-related activities in terms of work and voluntary participation, and their responses often conveyed a need to feel needed and have meaningful activities. Work gave meaning and content to everyday life. As one participant stated, 'That I am healthy, can control my own life, am needed as an extra resource at work after retirement, am able to spend time with children and grandchildren, friends and travel'. Work at this age is often voluntary or takes the form of unpaid volunteer (charity) work, and a sense of being needed, being useful and/or having a role were more important than remuneration. By helping others, older persons also help themselves by keeping themselves both physically and mentally active: 'To be able to help persons, small repairs, and so forth, that gives me vitality'.

Many participants mentioned interests such as needlework, carpentry, good food and drink, church life, membership in clubs/associations, auctions or flea markets as factors that positively influence their vitality. 'I have work and can stay until [I am] 68 and then everything fun, trips, and so on if [my] health allows'. Others often mentioned interests including, in particular, summer cottages, music, sports or travel. Reasonably good health was frequently mentioned as a condition for an active life. Interests in the form of physical activities also gave vitality, such as exercise, driving a motorcycle, sailing, fishing or elk hunting. Cultural activities such as enjoying music, watching television, reading, enjoying art, travelling, going to the theatre, singing in a choir, dancing or going to educational classes also gave vitality. Nature and the seasons of the year were often named as

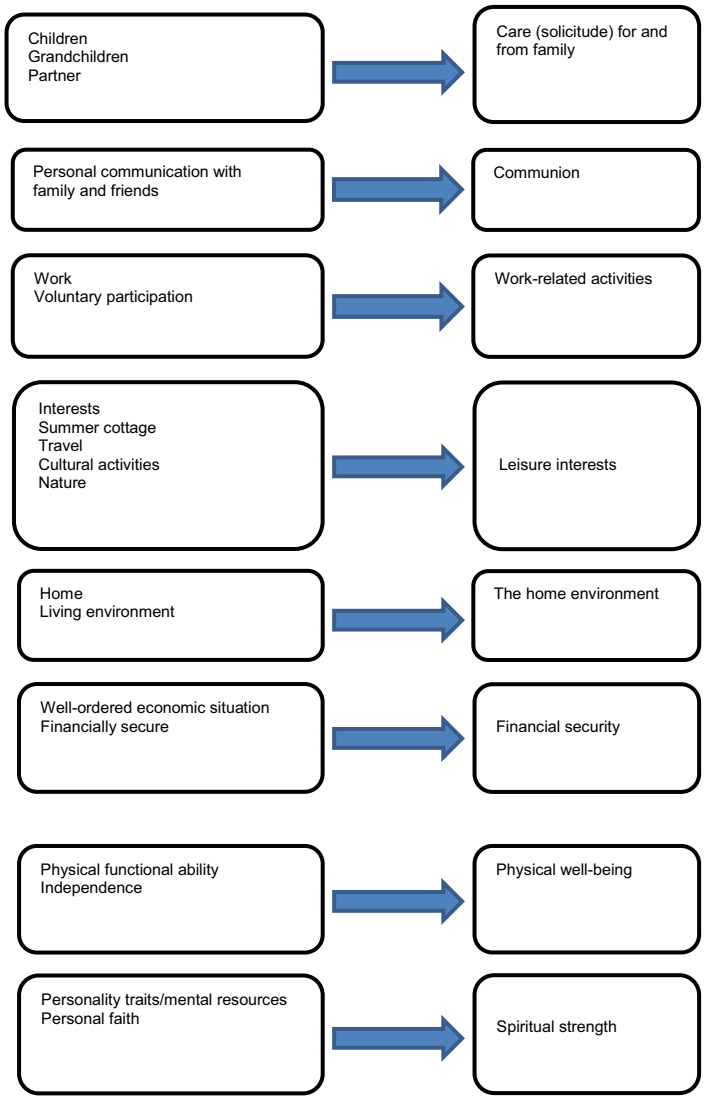

Figure 1 Participants' experiences of what positively influences their vitality, subcategories and categories.

sources of strength in everyday life. Even seasonal changes, with attendant shifts in weather, were felt to be positive. Some participants considered experiences in or with nature to be spiritual. Gardens, walks through the woods and fauna gave participants strength in daily life. 'The seasons, nature, the sun, the sea, flowers, the woods and fields, a breeze, the garden, [the] view of the lake, the mountains give me vitality'.

External resources that provide a sense of security

A homey feeling and own routines were important for the participants. Participants considered being able to live at home so valuable that they even mentioned home services and cleaning help as indirect sources of vitality. The home living environment was a sanctuary for both the corporal and spiritual body, where participants took sustenance and rested. Participants considered integrity to be important. 'To be able to wake up in [my] own bed in [my] own home gives strength'. Many participants associated their home with independence and being able to make decisions in regard to their own daily life. Knowing that it was possible to take care of oneself was a source of strength and a pride: 'That I can remain living in my home and manage without help from society'.

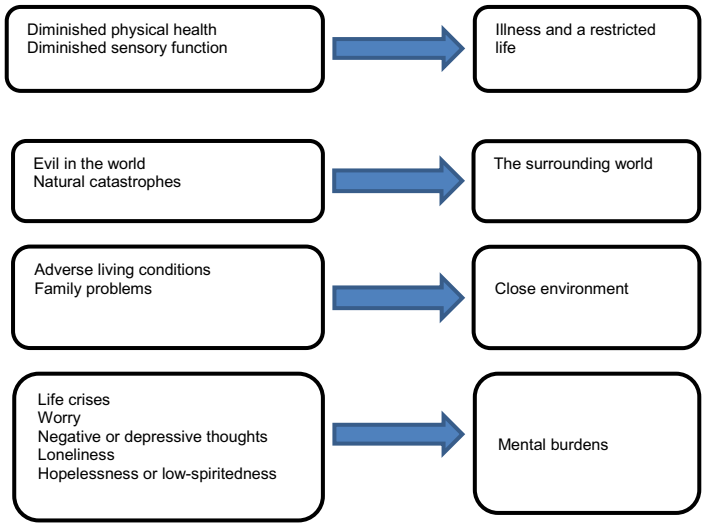

Figure 2 Participants' experiences of what negatively influences their vitality, subcategories and categories.

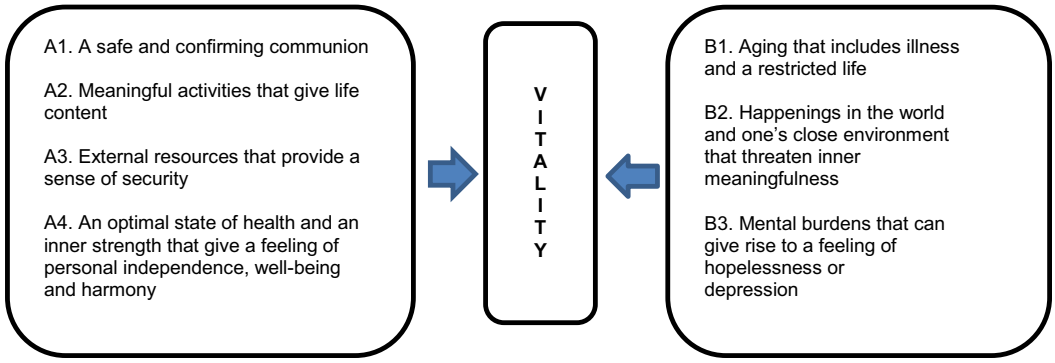

Figure 3 Participants' experiences of what positively or negatively influences their vitality, seen as themes.

Many participants mentioned that a well-ordered economic situation (financial security) gave them a sense of security and a feeling of independence. At this advanced age, it is possible to enjoy life's little luxuries if one's health and financial situation allow for it. To still save and plan purchases could also contribute to vitality: 'Health, quality of life, save and try to look forward'. To have something to look forward to and anticipate, whether an activity, a trip or a purchase, was a source of inspiration even for those of an advanced age. At the same time, participants demonstrated pride in having managed their life so that they could now enjoy themselves and were financially secure. One participant's answer summarised this theme's categories succinctly: 'Own bed, beautiful home, freedom to do what you want, my house, manage [alone], financial security, ordered finances, a cup of coffee, a hot bath, food and medicine'.

An optimal state of health and an inner strength that give a feeling of personal independence, well-being and harmony

Participants described physical well-being in relation to vitality in terms of a good physical functional ability. Participants experienced a reasonably good physical functional ability as being a prerequisite for an independent life. Independence was important for many participants, because everyday life could with greater likeliness be lived as one oneself desired: 'My mobility, be able to travel as one wants'.

Participants' responses revealed that surviving a period of illness can be turned into a sense of vitality and that after surviving they can feel grateful and stronger. Several participants mentioned that the knowledge that they had survived adversity and illness gave them the strength to continue living.

The participants described different personality traits as an expression of spiritual strength, for example: a positive approach to life, optimism, a sense of humor, good self-esteem, social skills, *sisu*, curiosity, belief in own will power, believe in oneself and one's possibilities, peace of mind, joyfulness, zest for life, personal life energy.

For many participants, personal faith comprised a source of strength for coping in everyday life. Faith gave everyday life content and meaning: 'Belief in God's solicitude'. Prayer, faith in God, reading the Bible and participating in Church life gave vitality: 'To leave everything in God's care'. A belief in life after death gave hope for an existence after this world, security and strength and gave participants the sense that life is something more than what we see and experience in the here and now. Participants also expressed an appreciation for fellowship within the church community and a communion with God as positive factors.

Ageing that includes illness and a restricted life

In relation to the physical factors associated with vitality, participants experienced diminished physical health as the most negative. The vitality of many participants was also influenced by disease-related health problems such as fatigue, ebbing strength, pain or depression. 'That the body is not capable of what the soul wants, if you are healthy you are happy'. One participant noted that even though one might have an illness, that one in general still leads a good life.

Many participants considered the physical changes and decline associated with ageing (diminished sensory function) to be natural but felt that such negatively influenced their vitality. The presence of disease or anxiety over the possibility of becoming ill, difficulties in sleeping and declining physical and mental capabilities were all mentioned as factors that negatively influenced vitality.

Happenings in the world and one's close environment that threaten inner meaningfulness

Societal and social factors that negatively influenced vitality included experiences that there were problems in the surrounding world, adverse living conditions or family problems. Participants related that factors such as natural catastrophes, evil in the world, unpleasant events, nonchalance, the situation in the world, war, injustices, unkind persons, jealousy, negative news or conflicts as negatively influencing vitality. 'People's envy and ill will, wars and natural disasters'. 'What is going on in the world today and our inability to feel empathy for future generations'.

Adverse living conditions threatened inner meaningfulness, such as economic troubles, housing, small pension, long distances, stress or a decline in the quality of care services for older persons. 'Decline in healthcare services and care for the elderly'. 'Devaluation of the elderly and handicapped'. Participants also experienced that family problems could negatively affect their vitality. 'My husband's alcohol problems' 'Unkind persons, jealousy, conflicts'.

Mental burdens that can give rise to a feeling of hopelessness or depression

A life crisis caused sadness and influenced mental health. The death of a husband or wife after a long marriage was for many participants a great sadness that negatively influenced their own vitality. General worry, both for larger and smaller things such as the quality of care services for older persons, also influenced vitality: 'Worry about not getting the care needed if illness occurs'.

Worry prompted by changes in life could lead to negative and depressive thoughts that weakened participants' vitality, for example a marriage crisis, the deaths of family or friends, conflicts in relationships, retirement, changes to the care system, deterioration of memory, fatigue or loneliness.

Discussion

Reflections on method

The material was comprehensive in the sense that slightly more than 2500 older persons have written down their experiences of what positively influences their vitality vs. what negatively influences their vitality. In that there were no standardised instruments or questions about vitality, two open-ended questions were developed and included in the questionnaire under the guidance of the GERDA research project leadership group.

We considered content analysis a suitable method, because it is recommended for use with relatively new research areas. Nevertheless, because the participants' answers were often relatively short, deeper analysis was not possible. A computer software program such as N-Vivo could provide a solution to this problem. The study's sample is representative for older persons aged between 65 and 75 in the actual regions. At the end of the analysis process, saturation of the material was obtained and no differences were seen between the included regions or age groups. The study results are therefore assessed as being trustworthy, and the results can be generalised for older persons aged between 65 and 75 in the actual regions.

Reflections on the findings

Contextual factors such as society and living environment influence older persons' experiences of their health and

well-being (11). Previous analyses of the GERDA project's data have shown that some differences do exist between the three included language groups regarding life orientation, zest for life, social networks and sense of security (8, 22, 23). Nyqvist et al. (24) found that Swedish speakers in Finland possess more structural and cognitive social capital than Finnish speakers and that social capital might to some extent explain the health differences seen between these two language groups. Continued research is needed, including an investigation of the importance of cultural factors on vitality and whether this study's results are applicable to the oldest old citizens in the actual regions. Based on the theory of gerotranscendence, one supposition is that the factors for vitality can change with age (cf. 9). Nevertheless, the themes in this study describe those factors in the lives of persons aged 65 and 75 that we assume are important in relation to vitality, zest for life and meaningfulness in life: communion, meaningful activities, a sense of security and health.

In our analysis of the participants' responses, we saw that communion is not merely a one-sided relationship; it is reciprocal and it is at least as important for older persons to feel needed and of use to their loved ones. This is supported by the results of another study of the same sample group's life orientation, which showed that older persons who live together with someone else were more satisfied with their life, experienced less loneliness and felt more needed (8). Earlier longitudinal studies of older persons' life orientation, a related area of research that is tangential to vitality, have shown that, above all, the experience of feeling needed positively influences life expectancy and need for institutional care (6). Korhonen et al. (25) noted that social contacts could protect older persons against chronic disease or the risk of dying prematurely. Nieminen et al.'s (26) research has shown that social participation and networks are associated with health behaviours such as smoking, alcohol use, physical activity, vegetable consumption and sleep. Human beings need a clear task or mission; they need to serve others and thereby preserve their feeling of being useful and valuable, even if they no longer have a professional role. The experience of not being involved or needed can be experienced as unpleasant, and this influences older persons' vitality (27).

For the majority of older persons, living in one's own home is the most desired form of living and children, grandchildren and family provide daily support (cf. 28). Hokkanen et al. (29), having studied the resources of older persons living in their own homes, also determined that the desire to continue to live at home and thereby control one's life and the ability to maintain social contacts and continue with important activities were the most important resources for older persons living at home.

In the participants' responses, we see that the various dimensions of health give strength in daily life and that illness negatively influences older persons' vitality. Previous research has shown that a person's physical condition influences life satisfaction (30). Health is important for independence, and studies of older persons have shown that the experience of independence is associated with the experience of good health (31).

The participants in this actual study worried about various happenings in the world and in their close environment. Worry about future generations and worry about who would care for them when care is needed also concerned the participants. Throughout the world, older persons face elevated risks related to violence, crime, civil conflicts, drug-related violence or even abuse (32, 33). In many countries, today economic discussions are taking place, where the financial possibilities for the continuation of state-funded social welfare and healthcare are being debated, which can lead to a sense of insecurity (cf. 22).

Many participants mentioned that mental burdens and crises had negatively affected their vitality, whereas others highlighted that adversity and crises had strengthened their personality. For some, adversity strengthened their fighting spirit and resolve, which perhaps in the long run strengthens vitality. The participants' experiences of being strengthened through adversity can be related to concepts such as sense of mastery, inner strength and *sisu*. Pearlin and Schooler (34) have pointed out the importance of having control in one's life and having the sense that life is manageable. A clear association has been found between low sense of mastery, feelings of depression and overall health. Boman et al. (35) found that inner strength might also have a protective effect against depression. We therefore suppose that adversity strengthens a person's sense of mastery and inner strength, thereby strengthening his/her self-esteem and belief in life as a bearing force.

Researchers have verified the association between optimism, coping and health in several studies (36). Personality has been described in terms of a person's enduring and pervasive personal motivation, emotion, interpersonal style, attitudes and behaviour. Key personality traits can be considered and defined as a person's consistent pattern of thoughts, feelings and actions over time and as those traits that characterise the person during his/her adult life (37). The participants in this actual study support such a definition when they emphasised the importance of personality and mental resources in regard to vitality. The personal resources mentioned in this study included being accepting of life's realities, being independent, maintaining a sense of humor, being joyful and having life experience.

A relatively large number of responses also included factors associated with faith and religion, which gave the impression that participants had a sense of security and a belief they could manage. Based on this, we assume that spirituality is connected to subjective health and

experienced life quality. The participants' responses can be seen in the light of the World Health Organization's definition of existential health: that one feels meaning, hope and communion and possesses an overall sense of unity with one's surroundings, whether spiritual, religious or political in nature (38). In this study, participants described spiritual strength as a way to 'rebound' after adversity and a way to feel joy in life. Factors that negatively influence vitality often comprise a threat to one's existential health. To find existential health despite experiencing something that negatively affects one's vitality requires a becoming. According to Eriksson (7), becoming is a reconciliation that results in human beings finding peace and becoming aware of their inner holiness. Vitality exists in each person's innermost room. When an older person derives strength from external sources, this also affects his/her inner vitality and he/she finds inner peace and satisfaction.

A supportive communion with family and friends, a sense of being useful, physical or cultural activities that provide meaning, a secure home and living environment, a well-ordered economic situation and physical well-being, mental resources and religion comprised important sources of strength for the participants in this study. The absence or shortage of these factors had a clear, negative affect. One supposition is that these factors mitigate the threat of nonbeing and fulfil human beings' longing for life, love and meaning. This study's results indicate that those factors in a person's life that can meet his/her most fundamental longing for life, love and meaning also strengthen his/her vitality. We suggest therefore the need for more research to investigate the connection between vitality, human beings' fundamental needs and existential health.

Conclusions and implications for clinical practice

Vitality can be understood as an important health resource. By taking into consideration that which positively vs. negatively affects the vitality of each unique person, Registered Nurses and other healthcare personnel can strengthen the person's vitality: in other words strengthen an older person's health resources and attempt to minimise and limit that which negatively influences vitality. By increasing our knowledge of what influences older persons' vitality, it is possible to improve their life situation so that vitality can be maintained despite the ageing process and setbacks in life.

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Author contributions

T. Söderbacka and L. Fagerström were responsible for the study conception, the design of the manuscript and for the drafting of the manuscript. The GERDA project group performed the data collection, and T. Söderbacka, L. Fagerström and L. Nyström performed the data analysis. L. Fagerström and L. Nyström made critical revisions of the article.

Ethical approval

The study was approved by the Ethics Committee of the Medical Faculty, Umeå University (§99-326) and by the local Research Ethics Committee of Vaasa Central Hospital.

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EMPIRICAL STUDIES

What is giving vitality to continue at work? A qualitative study of older health professionals' vitality sources

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Abstract

Background and aim: Vitality is described as 'life energy', 'inner strength' and 'inner health resource' and is the essence of health. Especially during the ageing process, it is of fundamental importance that an individual's health resources are strengthened to support work ability. The need for health services increases as the population ages and meanwhile the workforce in health care is also ageing. The aim of the study was to explore what is giving vitality to older workers in health care to continue at work until retirement age and maybe even an extended working life.

Informants, methodology and methods: A qualitative interview study was conducted. A total of 15 people aged 59–65 participated in the study, all of them working in the health care sector. Five participants were administrative personnel and ten were nurses. One man and fourteen women took part in the study. Qualitative content analyses were used.

Findings: The results show that meaningful work, possibilities to use one's knowledge, relationships and work community are promoting vitality. Vitality is affected by work conditions, benefits, personal values and own health.

Conclusion: Plans about continuing at work seem to depend on both external and internal reasons. Knowledge of what influences older employees' vitality resources makes it possible to improve their work situation so that vitality and work ability can be maintained by occupational health and employers despite the ageing process.

KEYWORDS

continue to work, health care, older worker, vitality, work ability

INTRODUCTION

Ageing of people and, therefore, workforce shortage is a growing problem in health care in the European Region. The need for health services increases as the population ages, meanwhile the workforce in health care is also ageing [1]. Globally, there should be around 40 million new health sector jobs by 2030, and even with this growth, there will be a lack of 18 million health workers to achieve the UN Sustainable Development Goals (SDGs) particularly in low- and lower-middle-income countries [1].

To reduce the general shortage of labour in many countries, in Finland, for example, there has been retirement reforms to extend working lives linking to life expectancy. Some positive results are already being seen in extending careers [2]. Today we know that by improving a person's physical health and well-being [3], working conditions [4], focusing on the balance between work challenges and person's health [5] and leadership [6], the retirement age may be postponed [3–6]. Even if there have been positive changes, there is a need to focus even more on the older workers' workability and what could promote their will to continue to work until retirement age and maybe even longer.

A person's willingness to continue working may be affected by other personal factors or work-related factors that may have an impact on her/his energy, overall vitality and zest for life. The theoretical framework of the actual study is about vitality as 'life energy', 'inner strength' and 'inner health resource' [7, 8]. Sources that in a person's own life or environment fulfil his/her most profound needs and desires can become important health resources [8]. If a person's vitality is a fundamental condition for a positive basic attitude in life [7, 8], the vitality will also affect the attitude to work. Can vitality resources that affect workability be found at work, and could external circumstances at work be resources for vitality? Therefore, the aim of this qualitative study is to explore what is giving vitality to older workers in health care to continue at work until retirement age and maybe even an extended working life.

BACKGROUND

The purpose of the Occupational Health Care Act (1383/2001) in Finland is to promote the prevention of work-related illnesses and accidents; the healthiness and safety of the work and the working environment; the health, working capacity and functional capacity of employees at the different stages of their working careers; and the functioning of the workplace community. This requires a joint effort by employers, employees and occupational health care providers [9]. The current increased ageing of the workforce is giving the occupational health care a significant task.

According to Finnish Institute of Occupational Health, individual work ability is a process of human resources in relation to work [10]. Health and functional capacities (physical, mental and social), education, competence, values, attitudes and motivation can be described as human resources. Workability is the outcome when these individual factors meet the work demands (physical and mental), work community and management and work environment. When focusing on older workers, 55 years or older is a common age criterion [10]. In the actual study, an older worker is >60 years old. Earlier studies show that reasons to continue to work may be achievements such as autonomy, training, transfer of skills and relevant roles in work teams [11]. In addition, economic advantages, an interesting work and flexible working time influence, are inducement to continue at work [12].

Intentions to retire early do not only depend on personal and organisational variables but also on processes related to ageing at the workplace. Early retirement intentions are more likely when older workers identify themselves with age-related persons [13]. A low physical activity correlates with an increased risk of early retirement, and therefore, physical activity should be promoted at workplaces [14]. Physically demanding work does not improve physical capacity among older workers. To lighten workload among older workers, it is necessary to reduce work demands according to their psychical capacity and/or to maintain their psychical capacity [15]. Andersen et al. [5] states that physically demanding work is a risk factor for disability pension among older female workers in eldercare. The risk for disability retirement increases in case of dissatisfaction with well-being and work life [16].

Older workers, who have a will to engage in development activities and get development opportunities from their work, are more likely to be committed to their workplace [17]. It should be in everyone's interest to make the best use of employees of all ages and to manage employees individually and highlight capacities. Continuation at work over age 63 is promoted by, among other things, good health, professional know-how, challenging work, supportive work atmosphere and good leadership. Retirement is an individual conversion, a process advancing in stages [6]. Older workers should be seen as a valuable resource. Older workers continue to be willing to be well trained and to be able to enhance companies' performance. The knowledge and expertise that older workers possess deserves awareness from organisations and to be maintained by encouragement and training [18]. Health-care interventions are needed to support older workers' working ability and improvements in work conditions [3]. According to Merkel, Ruokolainen and Holman, the health-care sector tends to focus on younger employees instead of ageing workers, even if both employees and employers could benefit from focusing on ageing workers [19]. Work can be therapeutic and improve quality of life and well-being. Work is beneficial for the physical and mental health and well-being, and unemployment connects with less psychical and mental health and well-being [20].

THEORETICAL PERSPECTIVE

According to Oxford Dictionary [21], vitality is like the state of being strong and active; energy and the power giving continuance of life present in all living things (Table 1). In this study, vitality is understood how it is described by Fagerström as a core concept in caring science [22]. Vitality is understood as not only a human being's own strength and inner resource but something that is also affected by external health resources that exist in one's surroundings [7]. Vitality is described by different sources in Table 1 and additionally as following:

Sources that in a person's own life or environment fulfil his/her most profound needs, that is to say, desires can become important health resources [8]. Human beings are not only driven by external benefits but also by deeper needs, wishes and desires, such as desire of life, love and meaning [22]. As human beings, we are longing for love and confirmation, and to experience that life is meaningful. Most often, we want to live for as long as possible, and try to avoid death by all means. A safe and confirming communion, meaningful activities, an optimal state of health and an inner strength are important sources of vitality [7]. Vitality is understood as the health's inner core and thereby it affects work ability. Through understanding what the human's internal and external health resources are, can vitality be strengthened. In occupational health care, a deeper understanding of vitality may promote workers' work ability.

We found previous studies that have focused on which factors at a workplace promote workability, how can workability be supported by leadership, risk factors for retirement, etc. However, we found very scarce knowledge about what work-related factors could have an impact on a person's vitality and thereby on the willingness to continue working until or past retirement age. Are there sources in the work and/or at a workplace that gives energy and could strengthen the person's vitality? Could a person's deeper needs and desires be met by the work and by continuing working? Due to the increased need of health-care workers, these particular professionals were seen as crucial for the actual study.

AIM

The aim of this qualitative study was to describe what is giving vitality to older workers in health care to continue at work until retirement age and maybe even an extended working life.

METHODS

Participants (p. 1–15), data collection and data analyses

This qualitative study was made in Ostrobothnia, Finland (in European Region), in January–February 2019. One municipal and one private health organisations were contacted. The HR department sent out the information letter about the study to the personnel through a hospital's intranet and a letter was sent to a small private health station. It is not known exactly how many potential persons the information was reached. Employees over 60 years old were invited to participate in the study and sign up directly to researcher (N.N.). Participation deadline was until the end of January, 2019. A total of 15 employees from the health-care sector signed up and were interviewed.

One person younger than 60 (59 years) asked for to participate and was allowed. Participants made a written informed consent for participating by e-mail or by a form. Of the participants, one person came from the private sector and totally fourteen from the public sector. Five participants were administrative personnel (two head nurses and three working with administration, like ward secretary, an important link in the care process), with an average age in this group of 60,4 years. Ten people were nursing personnel, with an average age in this group of 62,2 years. One man and fourteen women took part in the study. Average work experience from the current job was 31,6 years for nurses and 36,4 for administration personal. Two nurses of the fifteen participants were working after their official retirement age and three of them planned to work after official retirement age.

Interviews were conducted according to their own wishes, at the personnel's work place or at the University campus. Researcher (N.N.) performed the interviews

TABLE 1 Description of vitality by different sources

Oxford dictionary	Merriam-Webster	Chinese philosophy	Caring sciences, authors
Vitality is like the state of being strong and active; energy and the power giving continuance of life, present in all living things	Vitality is capacity to live and develop and also physical or mental vigor especially when highly developed	The very nature of existence, and the natural world exhibits consistent patterns that can be observed and followed, cyclical patterns based on interaction between polar forces	Vitality is described as 'life energy', 'inner strength' and 'inner health resource' and is the essence of health

during January–February 2019. The semi-structured interviews lasted about 60 min, and they were recorded and transcribed verbatim. Background and interviews questions were conducted about working career and retirement age. Most of the participants planned to work until 64–65 years. Some of the participants already used this possibility to work part-time. Researcher (N.N) booked 1 h for each interview. The interviews were recorded and transcribed. The question that was analysed in this study was: What is giving vitality and strength to continue at work? Some background questions were asked about working career and retirement age. Also questions about support for work ability during the last years of work were treated.

Interviews were analysed through qualitative content analysis with an inductive approach by identifying meaning units, followed by condensing, coding and abstraction into subcategories to classify the results later into categories [23]. First the researcher (N.N.) analysed and sorted the material into fourteen subcategories and together with the two other researchers the subcategories were sorted into five categories. Sorting was made manually. When sorting the material, it was checked that the subcategory was included in only one category. Opinions of the researcher were discussed from different point of views before the categories were compiled.

Ethical considerations

The research has been planned, conducted and reported in accordance with guidelines for the responsible conduct of research [24]. The interviews have been performed in accordance with good scientific practice. Information about confidentiality was emphasised, including the anonymity and participant's right to interrupt the interview if wished. Ethical permission was requested and granted by Åbo Akademi University. Research permit applications were sent to HR departments of the organisations and were granted.

FINDINGS

The qualitative analysis of the interviews consisted of the following five main categories (Table 2): *a meaningful work*, *opportunities to use knowledge and skills*, *relationships and a work community*, *work conditions and benefits*, *personal values and own health*.

TABLE 2 External and internal health resources

External health resources	Internal health resources
A meaningful work	Opportunities to use knowledge and skills
Relationships and a work community	Personal values and own health
Work conditions and benefits	

A meaningful work

Participants expressed that work gives meaning to life because of its content. The informants stated that meaningful work, to feel useful and needed, gives vitality to continue to work.

'When seeing patients are getting better and leave the hospital, then you feel like yes..., and particularly with very challenging patients, then you really feel: we did it well' (p. 15). *Helping others gives* a sense of *satisfaction*. 'It is the job itself, and the result of it, not money, but the results we achieve with patients to be rehabilitated' (p. 2). Many of the informants mentioned that a life without work would be empty. They found that they also received confirmation in their work through satisfied patients, that their effort makes sense. 'that you have enough job, and that you feel yourself valued at work, that is very important' (p. 10). They expressed that they wish to see the results of their work, for example, grateful patients.

Opportunities to use knowledge and skills

The informants stated that having the possibility to use one's experience and at the same time learn something new give vitality to continue at work. They found that if one's professionalism is not applied, it feels like waste of resources. 'I educated myself for quite long, and now I want to take advantage of it, as long as possible, and actually, I like to work. I think I would feel emptiness, if just being at home' (p. 3). They considered that interest and commitment for work; to see and learn new things as well as gain new knowledge is of importance. 'Of course, this is interesting' (p. 14). 'There are all the time new research findings and this is not a job where everything is static with same tasks every day' (p. 4). The informants experience that awareness of being good at work and to have occupational pride gives vitality. Some of them also found that receiving new tasks and challenges encourages the will to continue at work. 'I have got the opportunity from my employer to develop myself and I have been offered new tasks during my working career' (p. 13).

Relationships and a work community

The informants emphasised that good relationships and a feeling of being a part of the work community gives

vitality. To not only have fun with colleagues and to laugh but also to see results from teamwork strengthen the community and affinity. Some of the participants could share both sorrow and joy with the colleagues. 'The patients and of course colleagues, all this social life at work' (p. 6). They noted that taking care of each other, having a feeling of safety and trust brings well-being at work. Sometimes a positive feeling of being 'like a little family' (p. 5) at the work place was experienced during the work carrier. 'We talk about everything, if I am feeling sad, if I have had a bad sleep, I might say that I am not feeling good today' (p. 10). Some of the informants mentioned that when colleagues notice an absence, they feel valued at work. 'That if you had a day off, someone is saying: how nice to have you back' (p. 10). Feedback from patients, colleagues and supervisors is important, then they feel valued and useful and that one has a role in the team.

Work conditions and benefits

The informants mentioned that routines and a rhythm in the working day are experienced positively. The workplace and work conditions are important and affects the energy to work. Some of the informants mentioned that economic situations force or encourage them to continue to work and stated that working for money is a reason for continuing one's work. 'I want a sufficient retirement money' (p. 3). The informants maintained that a good leadership, a fair supervisor, introduction to tasks and someone who has time to support, gives vitality to work. 'We have always had good leaders, always a good head nurse, who has led us with a positive manner' (p. 7). The informants stated that it is the leadership that creates the atmosphere, and how one acts at work place. They maintained that a good work environment and an open atmosphere support the work ability for older workers.

Personal values and own health

Some individual factors that are giving strength to continue at work are thoughts like values and attitudes: 'Work is a way of living' and 'one is brought up to work' (p. 1). They found that openness and a positive attitude to life give the strength that is needed for work. 'I have quite a positive life orientation, I think that is very important' (p. 12). 'One should not dig into trouble, rather trying to see the possibilities' (p. 1). The informants who worked after retirement age stated that when there is a mental awareness that one can stop working and that it is one's own choice, this freedom enhances to work even after retirement age.

DISCUSSION

The aim of this study was to explore what is giving vitality to older workers in health care to continue at work until retirement age and maybe even an extended working life. Based on the interviews with older workers in health care, plans about continuing at work seem to depend on both external and internal health resources (Table 2). In our study, external health resources were found in the work environment and community, such as a meaningful work, positive relationships in the work community and work conditions and benefits. Internal factors were related to the person him-/herself, like personal health, a genuine will to help other people and to be needed and valued, personal values like attitude to work and the experience of meaningfulness at workplace.

Experiences of meaningfulness in work appeared clearly in the analysing process and meaningfulness seem to have two dimensions, that is, the work itself not only was meaningful but also the work seem to promote a feeling of meaningfulness in overall life. According to the interviews, participants wanted to have a meaningful work, by serving others and thereby be useful and valuable they experienced that the work was meaningful, and that strengthened their vitality and as a consequence they wanted to continue working. In addition, the opportunity to utilise their knowledge and experiences was seen as a vitality resource. Wärnå found in a study about workers and vitality that pride is the backbone of health, pride strengthens the health at work and that pride is also related to human dignity [25]. When one is competent for the work, and gets positive feedback from the patients, the dignity is confirmed and the vitality is strengthened. Also, Donoso et al. [26] suggest that emotional demands from the nursing profession have positive effects on motivation and well-being. All job demands do not have negative effects on workers' well-being. Emotional job demands can be a challenge for nurses, which promotes motivation and well-being [26].

Participants expressed clearly that through relationships with colleagues, one gets the feeling of being valued. Getting support from colleagues and supervisors was highly appreciated. According to our results, positive and warm relationships in the work community are strengthening the person's vitality and will to continue working despite high age. Vitality resources affect workability and when external circumstances at work are well managed, work also gives vitality. Challenging work, supportive work atmosphere and good leadership among others promote continuation at work for older workers [6]. Even personal values and health affect the will to continue at work. The participants in this study found that openness and a positive attitude to life give the strength that

is needed for work. Earlier studies show that the risk for disability retirement increases in a case of dissatisfaction with well-being [16], while health problems and, therefore, low physical activity is one risk factor for early exit from employment through disability retirement [14].

The reality, however, is that many older workers have a chronic disease [27]. Changes in working conditions for workers with chronic diseases influence the exit from working life. These workers working lives might be extended if the working conditions could be adjusted to their needs [27]. Mänty et al. [4] suggest that physical health functions of ageing employees may be maintained by promoting improvement of working conditions. A good physical and mental work environment that supports and motivates older workers is necessary to sustain the workforce. Torp [28] suggests that to create workplace health promotion, leaders need to understand that health is defined as something more than the absence of disease. There might be a will to continue at work if one's deeper needs and desires are met, despite struggling with diseases. Supervisors and occupational health professionals should thereby strengthen workers' awareness of benefits to continue at work. Work gives also meaning and context in life, and thereby affects health positively. The pathogenic approach in health care needs to be supplemented with a salutogenic approach, what might positively influence health, wellness and sense of coherence [22, 29]. In occupational health care, the salutogenic model in health promotion should be a natural perspective to focus on worker's resources and capacity and together with the employee and the supervisor adjust the work when needed.

Based on our study, we assume that vitality resources are found at work. As previously defined vitality is also capacity to live and develop, and vitality is like the state of being strong and active [21]. Our study's results indicate that central external health resources for a person's vitality were found at workplace, and that a person's internal health resources could be strengthened by working, and thereby the vitality if the work is meaningful and gives you a feeling of being valued. Being loved and confirmed by doing a meaningful work and good relationships at work strengthen vitality. A safe and confirming communion, meaningful activities, an optimal state of health and an inner strength are important sources of vitality [7]. Also, Lindholm et al. [30] state that communion with others and meaning in life are the sources of hope that increase strength to live and this stimulate vitality, the core substance of health.

The courage to live and meaningfulness in life are strengthened when a person feels confirmation and love in the community [22]. If the work can promote the satisfaction of person's longing for life, love and meaning, then there seem to be a willingness to work. Important values are realised when one is needed for another and there is a feeling of belonging to the work community.

Strengths: The focus group in this study is relevant because ageing of people and, therefore, workforce shortage is a growing problem in health care. Limitations: There were some limitations in the study process. In order to strengthen the focus of the study, it could have been limited to cover only practical nurses. Fifteen persons are a small group to make general conclusions. Further research could include also younger health workers and their vitality resources because the work demands and lack of nurses in the future is a challenging combination.

CONCLUSION

Vitality is the essence of health, and thereby we suggest that a good working life for older workers needs attention. For the informants in this study, a meaningful work and feeling of being useful and valuable are central vitality resources to continue at work. The results show that there are dimensions of work where one experiences meaningfulness, confirmation and feels more alive due to the possibility to use one's competence. Continued research on health resources, both at work and outside work, which are important for a person's vitality is necessary because of the increased need of health-care workers is combined with an ageing workforce.

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CONFLICTS OF INTERESTS

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

AUTHOR CONTRIBUTION

T. Söderbacka was responsible for data collection, the design of the manuscript and for the drafting of the manuscript. T. Söderbacka, L. Fagerström and L. Nyholm performed the data analysis. L. Fagerström and L. Nyholm made critical revisions of the article.

ETHICAL APPROVAL

The study was approved by the Ethics Committee of Åbo Akademi and by the local Research Ethics Committee of Vaasa Central Hospital.

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III

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Workplace interventions that support older employees' health and work ability - a scoping review

Tina Söderbacka*, Linda Nyholm and Lisbeth Fagerström

Abstract

Background: The aim of this study was to examine workplace interventions that support older employees' health and work ability and the effect of these interventions.

Methods: We used a scoping review, a type of a systematic literature review in which selected published academic articles and grey literature reports are included, to answer the following questions: 1) What kind of interventions have been made to support older employees' health? and 2) What effects do these interventions have on older employees' work ability? The scoping review framework proposed by Arksey and O'Malley and summarized by the Joanna Briggs Institute was used. Four key concepts comprised the basis for the research: health, intervention, older employee and work ability. A total of 8 articles were found to meet the inclusion and exclusion criteria. The study was limited to published academic articles between 2007 and 2019. Participant age varied between 37 and 74 years (overall average age 50–55) and workplaces comprised the intervention settings.

Results: Three main intervention categories were discerned: health checks and counselling for employees on the individual level, interventions based on screenings, and improvements in work environment or organization. Positive behavioral change and lowered health risks can be achieved through health counselling, which increases work ability. Measurements and screenings comprise good ways to chart and follow-up on employees' work ability and health status. Supervisor training and support from supervisors were seen to have a positive effect on health outcomes and increased work ability.

Conclusions: To guarantee good results, employers should focus on employees' health and interventions should occur when employees are younger than the studied group. The small number of articles related to intervention studies for the age group studied here indicate that a knowledge gap exists. We maintain that workplaces that promote employees' health by strengthening older employees' vitality can encourage employees to have longer careers.

Keywords: Health, Intervention, Older employee, Work ability, Scoping review

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Background

Between 2010 and 2030, the number of older employees in the European Union (EU) will increase, with the group aged 55–64 years estimated to expand by about 16.2%. Consequently, the mean age of the labor force will rise [1]. Employees' decreased work ability and/or early work retirement results in high costs for employers and governments alike and leads to inadequate workforce numbers [1]. It is important to support older employees' health and work ability, both from societal and individual perspectives.

Chronic health problems are related to decreased work ability and lower productivity at work [2]. In Finland in 2018, for example, the average retirement age was 61.3 years and the most common reason for early retirement was muscular-skeletal system problems (33%) and the second most common reason was mental problems (31%). Depression is the main single cause for retirement on a disability pension in Finland [1]. In most EU countries the official retirement age is 65 years, but Spain, Denmark, Germany and France have decided to raise this to 67 years while Great Britain and Ireland have raised this to 68 years [1]. In many countries, for example Finland and Denmark, retirement age is linked to estimated life expectancy [1]. Most EU countries have sought to increase the average/official retirement age and prevent early workforce exits. To guarantee future adequate workforce numbers, employees should already now considerably extend their working careers.

According to Kuoppala, Lamminpää and Husman [3] health promotion is valuable for employees' well-being and work ability, and they describe health promotion as a process that increases employees' control of health-related factors and thereby health. Older employees face a number of age-related physical and psychological changes. Between the ages of 40–65 muscle strength declines; by 65 there is a 10–25% decline in muscular capacity compared to the highest capacity [4]. Workplace health promotion should encompass employees' physical and psychosocial environments [3]. Crawford et al. [4] suggest that occupational health interventions can reduce the risk of early workforce retirement. Job resources, including the possibility to utilize one's strengths and potential, impact work engagement, which in turn has a positive influence on health [5]. Oakman et al. also suggest that workplace interventions can improve work ability [6].

From the older individual's perspective, a good working life supports health and work ability [7]. Worsened health has a negative impact on well-being and welfare, because illness results in suffering and decreased income. The maintenance of health, competencies and skills are important motives for prolonging workforce participation and social contacts, financial reward, appreciation and even challenges at work comprise reasons for continuing working [7]. While some research has been conducted, there is a need to summarize the research results available. A scoping review provides an overview through which researchers can disseminate findings and identify knowledge gaps. Therefore, the aim of this study was to examine workplace interventions that support older employees' health and work ability and the effect of these interventions.

In Finland, the services that occupational health care should provide are delineated by law [8]. The stated purpose of these services is to promote employees' work ability and functioning, which given the current increased aging of the workforce is a significant task. There is a long tradition behind occupational health care services in Finland, as the first law stipulating these services was confirmed in 1978 [9] and updated in 2001 [10]. In this study, the core elements of occupational health care interventions implemented to support older employees' health and work ability are defined as: older employee (55 years or older), health, intervention and work ability. When focusing on older employees' work ability, 55 years or older is a common age criterion; in the EU countries an aging worker is defined as 55–64 years of age [10]. The World Health Organization (1946) defines *health* as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Health is more than a lack of illness; it is understood as a human being's doing, being and becoming, where the human being's health resources constitute strong foundations [11]. In this study, *intervention* is defined as an action to improve the work ability of older employees and positively influence, i.e., prolong, workforce participation. *Work ability* here is defined as the balance between work and individual resources [12]. Work ability can be evaluated using the Work Ability Index (WAI), which was developed in Finland in the early 1980s by researchers from the Finnish Institute of Occupational Health [8]. Ilmarinen [8] describes work ability as a house with four floors. The first floor consists of health and functional capacity, which are the basics of work ability. The second floor consists of knowledge and skills, which are a part of work ability. The third floor consists of human resources, comprising values, attitudes and motivation. The fourth floor consists of work, comprising work conditions, contents and demands, community and organization, supervisory work and management. According to Ilmarinen, situated in the immediate surroundings of the "work ability house" are the organizations that support work, such as occupational health care, family and close community, e.g., relatives and friends [8].

Methods

This study is a scoping review, an increasingly popular method in health sciences used to summarize and synthesize health evidence, and is useful method when charting what is known about a subject. While a scoping review is a type of systematic literature review, its focus is to provide an overview of the research landscape, disseminate findings and identify gaps in the research rather than provide a synthesis or meta-analysis of findings or evaluate research quality [13–15]. A scoping review may therefore draw upon data from any type of research evidence or methodology, and allows researchers to generate findings that can complement clinical trial results [13–15]. Here this method is used to reveal various sources of information, including primary research studies, systematic reviews, meta-analyses and guidelines together with grey literature (materials and research produced by organizations outside of the academic publishing). In the scoping review framework proposed by Arksey and O'Malley [13] and summarized by the Joanna Briggs Institute [14], a six-stage approach to conducting such a review is outlined: (1) identify the research question; (2) identify relevant literature; (3) select the literature; (4) chart the data; (5) collate, summarize and report results; and (6) consultation (stage six is optional and was not used in this review). A scoping review has a broader scope than a systematic review and the purpose of the scoping review is to identify knowledge gaps [16].

Stage one: identify the research question

Four key concepts comprised the basis for the research: *health, intervention, older employee, work ability*. A two-part research question was developed:

1) What kind of interventions have been implemented to support older employees' health?

2) Which effects do these interventions have on older employees' work ability?

Stage two: identify relevant studies

In the identification stage: an initial search for articles published between 2007 and early 2019 was conducted in PubMed and EBSCO (Academic Search Premier, CINAHL, PsycArticles and PsycINFO), using the following search terms and with a focus on older employees: "health", "intervention" and "older employee". This initial search resulted in 27 articles from EBSCO and 33,121 from PubMed. In the screening stage: due to the large number of research publications found in PubMed, a second search of PubMed occurred, limited to articles not older than twelve years and with the inclusion of an additional search term, "work ability". This yielded 607 articles, equating to 634 articles from the first and second database searches. Through other sources (Google Scholar) a further 76 articles were found. No identification of duplicates through RefWorks were found. Of the 710 articles found through the aforementioned searches, title and abstract screening revealed 656 articles that were not relevant, and of the remaining 54 articles a further 20 were excluded. In the eligibility stage these 34 articles were analyzed, resulting in 26 articles being excluded because they were not sufficiently relevant for the study. In the inclusion stage a total of 8 articles were selected for inclusion in accordance with the inclusion criteria. The study selection process is described in a PRISMA flow diagram (see Fig. 1).

Stage three: select the literature

The 710 articles resulting from the first database, second database and Google Scholar searches were screened for relevance by the first author (TS), who was in turn monitored by the second author (LN). At first only titles and abstracts were reviewed, then full-text articles were assessed, with all study authors thereafter agreeing on which articles were eligible for inclusion. Articles meeting the following were included: presentations of health-supporting interventions predominantly designed for older employees in workplaces. Although this eliminated interventions related to younger employees, it was crucial to achieving a focused search consistent with the study aim. While some of the studies included also encompassed younger participants, all of the studies focused on interventions that prolong workforce participation. The overall average participant age ranged from 50 to 55 years. All three authors together discussed any discrepancies related to inclusion and exclusion. In total, eight studies were included for further in-depth review.

Stage four: chart the data

The scoping review selection process is shown in Fig. 1. The aim of this study was to examine workplace interventions that support older employees' health and work ability and the effect of these interventions thus our literature charting emphasized the basic characteristics of each of the articles selected. A data extraction framework was created to present the data in a comprehensive way, including characteristics such as: author, year of publication, origin, aim/purpose, methods, participants, intervention, outcome and key findings (Table 1). The content of the interventions in the included studies was also charted, with regard to similarities and differences. The data in the framework was completed and cross-checked by all authors.

Results

Of the eight studies included for in-depth review, five were conducted in Europe, two in Japan and one in South Africa. Participant age varied between 37 and 74

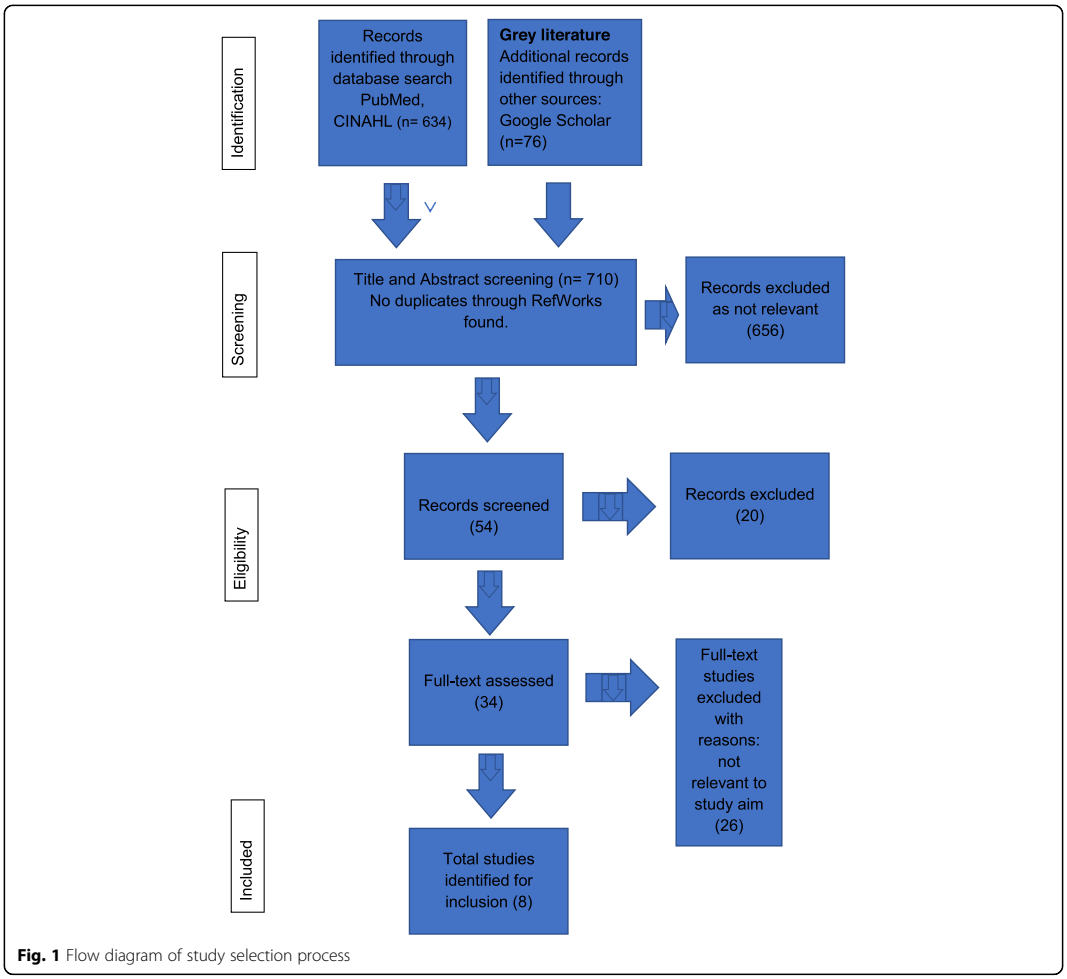

Fig. 1 Flow diagram of study selection process

years and workplaces comprised the intervention settings. While in many cases participant profession was not revealed, those included were, among others: office workers, newspaper company management, academic hospital management, intensive care workers, administrative personnel, executive workers and executive worker supervisors. Both women and men were included in all but two studies; one study included only men another only women. Two studies targeted older employees (> 60 years), five studies targeted ageing employees (> 40 years) and one study included employees in a wide age range between 37 and 63 years of age, however the mean age was 50,8 years. A diverse range of research designs were seen: systematic review (1), narrative synthesis (1), statistical analyses of data (2), randomized controlled trial design (2) and others (2).

During the charting of the content of the interventions that support older employees' health, three main categories based on similarities were identified: "health checks and counselling for employees on the individual level", "interventions based on screenings", and "improvements in work environment or organization". We also present below the effects of interventions on older employees' work ability in general as seen in the included studies.

Health checks and counselling for employees on the individual level

In three studies there were interventions with a focus on the individual level, with health checks and counselling interventions. Strijk et al. [22] conducted a six-month intervention study aimed at changing employees'

Table 1 Comprehensive classification of included articles

Author, Year of publication, Origin	Aim/Purpose	Methods	Participants	Intervention	Outcome and key findings
Ariyoshi (2009) [17], Japan	To evaluate the impact of interventions for menopausal symptoms among employees.	Evaluation included surveys of current employees or former employees with symptoms of menopause and case studies of three women. Interviews with women in their 40s and 50s.	Employees at a newspaper company, employees with symptoms of menopause and case studies of three women.	Development of women's health management support system, gynecologic check-ups, consultation with the occupational health nurse and occupational physician, etc.	Comparisons before and after implementing changes in the health system revealed that the number of women describing symptoms of menopause decreased from 5 to 0. The number of women retiring or dying while still employed also decreased as well as the number of sick leaves. Interventions for menopause, such as mental health interventions, require specific human resources and systemic support.
Cloostermans et al. (2015) [18], Netherlands	To summarize literature on the effects of interventions for ageing workers that address retirement, work ability and work productivity.	A systematic review of four studies.	Workers aged > 40.	Individual (e.g. exercise) programs, workplace programs, personal coach, weekly guided exercise, yoga sessions, free fruit, counselling and education, occupational program for ageing workers by occupational physician, financial support to implement rehabilitation activities.	Limited evidence for a favorable effect on early retirement was found. Workers in the intervention group took later retirement than those in the control group. The risk of early retirement in the plant that received more financial support was about twice as low as the plant with less support.
Costa et al. (2011) [19], Portugal	Goal of creating a decision-making framework oriented toward the maintenance of the health and working ability of aged computer workers.	Assessment of work ability.	Fifty IT workers, mean age 50,8 years old (37–63 years) participated in this study.	Work Ability Index (WAI).	78% of participants had good or excellent work ability and only 2% poor work ability. This study confirms that work ability decreases in workers alongside aging. The evaluation of work ability was elementary to ensuring an age-friendly workplace. The WAI was used to evaluate work ability. The results can help with the early identification of employees with weak work ability, helping to improve working conditions and support the continued working career of workers at their current job.
Kohro et al. (2008) [20], Japan	To screen individuals who are likely to develop lifestyle related diseases and provide early intervention programs.	Review/follow-up study.	Workplace employees and elderly people (65–74 years), all citizens in Japan.	Health campaigns, health checks, counselling intervention. Nationwide program may raise public awareness.	Intervention programs with short follow-up periods are successful regarding cardiovascular risks, but general clinical benefits are observed first about 10 years after intervention.
Koolhaas et al. (2010) [21], Netherlands	To evaluate the process and effectiveness of the intervention compared with care as usual. Research on workplace health promotion.	Cluster- randomized controlled trial design with a 1-year follow-up.	Workers aged 45 years and older; n = workers from intensive care, administration, personnel, executive workers and department supervisors.	Measurements at 3, 6 and 12 months using WAI (work ability), self-reported 12-Item Short Form Health Survey (SF-12; vitality), QQ-method (productivity).	The primary outcomes are work ability, vitality and productivity. The intervention offers a structured method for workers to communicate with their supervisor about their work environment, barriers to work performance and career opportunities.

Table 1 Comprehensive classification of included articles *(Continued)*

Author, Year of publication, Origin	Aim/Purpose	Methods	Participants	Intervention	Outcome and key findings
Strijk et al. (2013) [22], Netherlands	A worksite lifestyle intervention to improve lifestyle behaviors, to keep older workers vital and thereby prolong their labor participation.	A randomized controlled trial design.	367 workers from two academic hospitals. Age ≥ 45 years	6-month intervention: weekly guided group sessions (one yoga, one workout) plus weekly session (aerobic exercise). Individual coach visits aimed at changing workers' lifestyle behavior. Free fruit provided at guided sessions.	No significant differences in vitality, work engagement, productivity or sick leave were seen between the intervention and control group workers after either 6- or 12-month follow-up. Yoga and workout subgroup analyses showed a 12-month favorable effect on work-related vitality. Implementation of worksite yoga facilities could be a useful strategy to promote vitality-related work outcomes, but only if high compliance can be maximized.
Veller et al. (2007) [23], South Africa	To assess the feasibility and affordability of a targeted screening program for abdominal aortic aneurysms in a group of employer-based medical schemes.	Database review and data extraction, member enrolment by mail. Ultrasound screening.	207 males, 60–65 years. Advice to consult the doctor if they were smoking or had a cardiovascul-ar disease.	Ultrasound screening.	Screening and findings, type and cost of interventions recommended by provider. Screening for abdominal aortic aneurysms reduces morbidity and mortality but at a significant cost; costly intervention.
Wagner et al. (2008) [24], Germany	The effect of cognitive-training programs.	A cognitive-training program was implemented and evaluated.	Middle-aged employees ($n = 33$), 50–59 years, were included in the study at the Psychosomatic Clinic Bad Neustadt.	Training sessions 7×60–90 min, behavioral analysis, behavioral therapy.	Memory performance of the intervention group improved significantly between intake and discharge. A cognitive-training program is useful and effective in patients with mild cognitive impairment.

lifestyles, where employees participated in weekly guided yoga and group workout and aerobic exercise sessions. Ariyoshi [17] conducted an intervention study for women with menopausal symptoms among employees at a newspaper company, where individual consultations with specialists were seen. Kohro et al. [20] investigated an intervention connected to a national health campaign for all Japanese citizens for the prevention of lifestyle-related diseases, including a workplace health check-up program (including individual and group counselling) for employees and a health check-up program for pensioned individuals.

Interventions based on screenings

In three studies there were interventions based on screenings. The WAI is an instrument used in clinical occupational health and research to assess work ability during health examinations and workplace surveys [10]. Costa et al. [19] used the WAI, with the goal of creating a decision-making health-maintenance framework, to assess employees in the IT sector. Koolhaas et al. [21] used the WAI and self-reported 12-Item Short Form Health Survey (SF-12) to evaluate improvements in health-related outcomes versus care as usual. Veller et al. [23] assessed the feasibility of a targeted screening program for abdominal aortic aneurysms, including ultrasound screening.

Improvements in work environment or organization

In three studies, there were interventions in which attempts to improve the work environment or organization were investigated. Training supervisors was one intervention used to attempt to prolong workforce participation. Wagner et al. [24] created a cognitive-training program that was implemented on and evaluated by middle-aged employees. Some interventions targeted both the individual and organizational levels. Koolhaas et al. investigated supervisors' ability to support employees in taking necessary action by enhancing knowledge and competence and better utilization of human resource professionals and occupational health care [21]. In Cloostermans et al.'s [18] systematic review of literature in which the effects of interventions for aging were addressed, a study by Goine et al. [25] was included. An organizational intervention occurred, where workplaces received financial support to implement vocational rehabilitation activities, intended for the improvement of the physical environment [25].

Effects of interventions on older employees' work ability in general

Positive behavioral change and lowered health risks can be achieved through health counselling. Kohro et al. [20] found that a nationwide health program may raise public awareness and emphasize that it takes at least 10 years before it is possible to evaluate the benefits of primary prevention. Strijk et al. [22] found that strong participant commitment is necessary, at least regarding yoga as a way to promote vitality at work for aging employees. While in Strijk et al.'s study yoga and workout subgroup analyses showed a 12-month favorable effect on work-related vitality, no significant differences were found in work engagement, productivity or sick leave between the intervention and control group after either 6- or 12-month follow-up [22]. Cloostermans et al. [18] found that the risk for early retirement in the group that received more financial support was about twice as low as the control group with less support. The interventions included individual (e.g., exercise) programs, workplace programs, a personal coach, weekly guided exercise, yoga sessions, free fruit, counselling and education, an occupational program for ageing employees lead by occupational physician, and financial support to implement rehabilitation activities [18]. Differentiating between menopausal disorders and mental health issues is not always easy, and Ariyoshi et al. [17] saw that by implementing changes to the health system, women describing symptoms of menopause, retiring or dying while still employed, and sick leaves decreased.

Wagner et al. [24] found that a cognitive-training program is useful for patients with mild cognitive impairment; the intervention group showed increased results in memory tests and in subjective memory performance and a significantly reduced level of exhaustion. Most of Wagner et al.'s study participants reported that they had better self-confidence in the workplace after training and felt more able to distance themselves from the demands of their jobs [24]. Costa et al. [19] established that the evaluation of work ability is elementary to creating age-friendly workplaces and that the possible identification of employees with weak work ability earlier can improve working conditions and support the continued working career of workers in their current job. They developed interventions based on WAI results (engineering, organizational and training) and found that while the WAI is a useful tool in helping prevent impairments to work for employees on the individual level, there was nonetheless a decrease in the employees' work ability.

Koolhaas et al. [21] utilized and investigated a structured method whereby employees could communicate with supervisors about their work environment, barriers to work performance and career opportunities. Support from colleagues, informal networking and superiors was seen to be positive, and supervisor training reduced stereotypes, team conflicts and enhanced innovations [21]. Veller et al. [23] found that screening programs, like screening for abdominal aortic aneurysms are costly interventions, but reduce morbidity and mortality [23].

Discussion

The aim of this study was to examine the workplace interventions that support older employees' health and work ability and the effect of these interventions. Few studies on such interventions in relation to older employees are seen, and Poscia et al. [26] report that workplace health promotion actions for older employees are generally of poor quality. To guarantee good results, employers should focus on employee health and interventions should occur when employees are younger. One should also remember that employees' own mental processes regarding retirement, starting about age 55, are important [21]. From a societal perspective, employees' decreased work ability and/or early work retirement results in high costs for employers and inadequate workforce numbers, while from an individual perspective a good working life supports older employees' health and work ability. We discerned three main categories based on similarities and found that health promotion interventions are positive for older employees.

Health checks and counselling for employees on the individual level can support older employees' work ability. Health campaigns that focus on the health and work ability of older employees might be costly, but early retirement due to poor work ability is even more expensive and is often the result of employees suffering from pain or mental illness. The continuous follow-up of employees' work ability through measurements and screenings provide occupational health care services with information through which to predict risks for early retirement, and we saw that health counselling can lower health risks. Interventions based on measurements and screenings were also seen to support older employees' work ability. While measurements and screenings comprise good ways to chart and follow-up on employees' work ability and health status, a plan whereby results are analyzed is nonetheless necessary, because otherwise important data are wasted. Casual screenings appear to be an expensive way of collecting health status data.

Improvements in work environment or organization were even seen to support older employees' work ability. Possibility to communicate with supervisors was seen to have a positive effect on health outcomes and increased work ability [21]. Other interventions required very long-term study participation, which is often not realistic for participants. It seems that by influencing management and the workplace it is possible to prolong workforce participation. Focus cannot merely be placed on the employee; also, management and organizational changes, including personal consultation for employees seemed to be effective ways to prolong workforce participation and promote better employee working ability.

While ageism and a lack of recognition, development possibilities and predictability are associated with older male employees' plans for early retirement, work ability is seen to have the strongest association with retirement plans for both genders [27]. Interventions that focuses on management changes and employee support are important, but employees' work ability is the main resource. Also, Torp and Vinje [28] find that sustainable production is based on workers' health. Motivation and engagement in work also influences work ability [28].

Many employees consider their functional limitations to be a part of normal aging. Steenstra et al. [29] recommend that multi-component interventions including health service, coordination of services and work modifications could be used to strengthen older employees' work participation. Honkonen et al. find that work ability meetings could provide a forum to discuss workplace adjustments that support employees in remaining at work, including, e.g., work modifications, adjustments and vocational rehabilitation [30]. Unfortunately, not all employees who would benefit from age-related workplace adjustments find that their needs are being met [31].

We used a scoping review to reveal and describe published main studies related to a topic of interest. We found too few intervention studies in which a focus on older employees was included, and that proper documentation and follow-up was lacking for those interventions that did include older employees. Interventions related to human resources (values, attitudes and motivation) were also not seen. Thus, given such a knowledge gap, we suggest that further, deeper research be undertaken. We found that a scoping review is a useful method when charting knowledge. The strength of the study is that the results can be applied to management and occupational health care in practice. One limitation is that, because in some of the included articles the description of the study method used was ambiguous, it was difficult to categorize the articles. Also, the inclusion and exclusion criteria resulted in a somewhat limited sample size.

Conclusions

We can conclude based on the results of this scoping review that some positive results are seen from the interventions, though the samples were relatively limited. To guarantee good results employers should focus on employees' health, and our recommendation is that interventions should occur when employees are younger than the groups studied here. On an individual level, health checks and counselling for employees can support older employees work ability. Screenings provide occupational health care services and management with information through which to predict risks for early retirement. On an organisational level, improvements in work environment were also seen to support older employees work

ability. The small number of articles related to intervention studies for older employees indicate that a knowledge gap exists, and further research is needed.

The small number of articles related to intervention studies for older employees indicate that a knowledge gap exists, despite that an ageing population is a challenge for societies throughout the world. We therefore recommend that occupational health and human resources departments implement interventions, such as health campaigns, that promote employees' work ability as the foundation for their work.

Abbreviations

WAI : Work Ability Index, page 5.

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Authors' contributions

TS was the principal investigator. This study is a part of a doctoral dissertation (TS). TS designed the study, conducted the search, extracted the data, and analyzed the data. LN acted as a second reviewer. LN and LF provided feedback and assisted in the review of the final manuscript. LN and LF served as TS's graduate supervisor. All authors read and approved the final manuscript before submission.

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Availability of data and materials

The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

Ethics approval and consent to participate

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Consent for publication

Not applicable.

Competing interests

The authors declare they have no competing interests.

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