Is continuing professional development different for older nurses? A literature review exploring 5 conceptualisations of age

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Abstract
The nursing workforce is aging. When people age changes occur in biological, psychological and social functioning. Little is known about the effects of these changes on nurses’ continuing professional development (CPD). A literature review was conducted to investigate if older and younger nurses’ CPD differs, in what respect and which age-related factors might explain these differences. Given the limited research among nurses, also studies among workers in general were included. Five operationalisations of age were used: chronological, functional, psychosocial, organizational and life span age. The review revealed 26 relevant studies, examining age differences in motivation for, participation in and learning outcomes of CPD. In general older workers seemed less likely to participate in CPD, especially when considering formal CPD activities and workers in late career (older than 50/55 years). No clear age patterns were found for motivation and learning outcomes. Results were equivocal due to conceptual diversity. Reviewing the factors that influenced age differences, it seemed that psychosocial and organizational age were negatively associated with motivation for and participation in CPD. The effect of functional age and life span age were less studied and therefore less clear. This paper gives input for further research in this field.

Keywords
continuing professional development, age differences, nurses, older workers, review
1. Introduction

Continuing professional development (CPD) of nurses is considered to be increasingly necessary to keep abreast of rapid changes in patient care due to advancements in knowledge and technology (Atack 2003, Berings 2006, Gopee 2001). In addition, CPD is important for nurses’ job satisfaction and commitment (Berings 2006, Chien, Chou & Hung 2008). Lack of CPD influences nurses’ decisions to leave their profession (Hallin, Danielson 2008) and to retire early (Andrews, Manthorpe & Watson 2005)(Andrews, Manthorpe & Watson 2005, Armstrong-Stassen, Schlosser 2008).

Concurrently, the nursing workforce is growing older. In Dutch hospitals, the percentage of workers over 50 has grown from approximately 19% in 2003 to 27% in 2009 and is expected to grow to 36 - 39% in 2018 (Van der Windt, Van der Velde & Van der Kwartel 2009). This demographic trend applies to other western countries, such as the United Kingdom (Harris et al. 2010, Wray et al. 2009), Canada (Spinks, Moore 2007) and the United States (Stewart-Amidei 2006).

These two trends underscore the importance of understanding and managing CPD of older nurses. Employers, nurses associations and national health agencies, used to a workforce traditionally dominated by younger nurses (Palumbo et al. 2009), are challenged to develop CPD approaches geared towards the needs of all age groups (Andrews, Manthorpe & Watson 2005).

Few studies examined CPD of older nurses and even less studied differences with other age groups. In an attempt to fill this gap, this explorative paper examines in what respect CPD of older nurses differs from that of other age groups, and which age-related factors contribute to these differences. Given there is limited research on older nurses’ CPD, this paper also reviews the literature of age difference in CPD of workers in general. Before addressing the research questions, the concepts of CPD and age will be discussed.

2. Concept of continuing professional development

There seems to be little consensus on the definition of CPD in the human resource development and nursing literature. Several related concepts, such as continuing education and life-long learning are used interchangeably, sometimes with different meanings (Gopee 2001, Gallagher 2007). The American Nurses Association (ANA) defines CPD as “a life-long process of active participation by nurses in learning activities that assist in developing and maintaining their continuing competence, enhancing their professional practice, and supporting achievement of their career goals” (ANA 2011).

This definition encompasses different purposes of CPD. CPD can be as specific as skills training or as broad as personal development (Cooper 2009), can aim at retention of core skills or extension of nursing roles and career opportunities (Drey, Gould & Allan 2009). The definition fits with nurses’ perceptions of CPD as being important for enhancing service provision, maintaining safety for patients and themselves, and increasing career and personal opportunities (Gould, Drey & Berridge 2007). CPD benefits patient care, the organization and the individual (Nolan et al. 2000, Wood 1998).

Several studies show that nurses develop through a broad range of learning activities, varying from formalised courses to interactions with colleagues and other daily work experiences (Berings 2006, Eraut 2007, Estabrooks et al. 2005). Nevertheless, opinions vary on the learning activities that can be counted CPD.
Some confine it to formal courses, using it as a synonym for continuing education, while others use a broader perspective.

Discussion on the learning activities that can be considered CPD, is hindered by the lack of a widely accepted typology of learning activities. Often formal and informal learning are distinguished, with the first referring to intentionally planned learning in an educational setting and the latter to learning in a workplace environment. This distinction does not take into account that learning at the workplace can also be highly structured and designed to ensure the continuity of an organization (Billett 2006). Tynjäla (2008) distinguishes three modes of workplace learning: incidental and informal learning as a side effect of working, intentional and non-formal learning activities, and formal on- and off-the-job training. In this paper we will review literature focusing on all kinds of CPD activities.

3. Five operationalisations of age
There has been much debate on who is considered an ‘older worker’. Age seems to be a simple concept, but a closer look reveals that age can be conceptualised in many ways (Schalk et al. 2010). During their lives people do change in biological, psychological, and social functioning (Sterns, Miklos 1995). These three types of aging results in different approaches to conceptualise and operationalise age (Schalk et al. 2010, Sterns, Doverspike 1989). In a study on the (re)training of older adult Sterns and Doverspike (1989) distinguished five approaches. Recently, these have been used as a framework to study issues of aging and work (Schalk et al. 2010, De Lange et al. 2006, Kooij et al. 2008). We have used it (see figure 1) to review the literature on age differences in nurses’ CPD.

Adapted from De Lange et al. (2006) and Kooij et al. (2008)

Figure 1 Conceptualisations of ‘older worker’ and possible indicators
Chronological age
This refers to one’s calendar age. The distinction between younger and older workers is frequently based on chronological age (Sterns, Miklos 1995). Although age in itself it is not a useful indicator of behavioural change (Kooij et al. 2008, Settersten, Mayer 1997), chronological age is convenient and used broadly. For instance, statutory regulations on retirement age and special provisions such as additional holidays, use chronological age to define the ‘older worker’ (Schalk et al. 2010).

The ‘older nurse’ is often conceptualized as being in their 40s, 50s and 60s (Buchan 1999, Fitzgerald 2007). In this life stage major changes occur in relevant work related functions (Ilmarinen 2001). The exact definition can differ depending on whether it refers to legal or government practices (Palumbo et al. 2009). Some define older nurses as aged 40/45 years and over, while others use 55 years as a demarcation.

Functional age
This construct recognizes that as chronological age increases individuals go through various biological and psychological changes (Sterns, Doverspike 1989), which may be reflected in health status, physical capacity and cognitive performance (Sterns, Miklos 1995, Kooij et al. 2008). Studying age differences in CPD, especially cognitive functioning seems to be relevant.

Older workers are often viewed as less able to learn than their younger colleagues (Gray, McGregor 2003). This seems to be supported by the results of a meta-analytic review of the relationship between age and job-related training (Kubeck et al. 1996). It revealed that older adults showed less mastery of training material, completed the final task more slowly, and took longer to complete the programme. These results should be interpreted with some caution. The outcome differences could also reflect pre-training differences instead of indicating that older adults learn less (Kubeck et al. 1996). Besides, laboratory samples showed larger age differences than field samples, probably implying that in real-world tasks the effects of practice and experience may counter age-related declines. Finally, learning at the workplace may allow older workers to compensate for less mastery of training material (Kubeck et al. 1996).

Research on cognitive ability shows that age differences in learning also depend on the content of the learning and the necessary cognitive abilities. A review of the literature showed that a decline in cognitive abilities is found when considering fluid intelligence (working memory, abstract reasoning, attention and processing novel information). In contrast, crystallized intellectual abilities, representing aspects of educational and experiential knowledge, showed increasing levels of performance into middle age and beyond (Kanfer, Ackerman 2004). Therefore, it might be relevant to make a distinction between learning in a radically different field and learning new skills within the expert domain of the experienced worker (Lahn 2003). Also Beier and Ackerman (2005) provided a more optimistic view on the relationship between learning and aging than often assumed. Their research showed that prior knowledge was an important predictor of knowledge acquisition for learning.

Psychosocial age
Psychosocial definitions of older workers include those based on social- and self-perceptions of the older worker (Sterns, Doverspike 1989, Kooij et al. 2008).

Social perception refers to expectations and norms of appropriate behaviour and characteristics for people at different ages (Schalk et al. 2010). A significant
amount of research has investigated the perceived attributes (or stereotypes) of older workers. Several reviews show that, although research results are equivocal, older workers are perceived as harder to train, less motivated to learn, inflexible and less able to keep up with technological changes (Sterns, Doverspike 1989, Kooij et al. 2008, Gray, McGregor 2003). Older workers are also perceived as having positive traits, such as having a strong work ethic, being conscientious, knowledgeable and having higher commitment (Sterns, Doverspike 1989, Kooij et al. 2008, Kanfer, Ackerman 2004).

Negative stereotypes of older workers leads to a paradox (Billett et al. 2011). Employers are increasingly in need of the service of older workers, but negative views about their performance and adaptability can lead to discriminatory managerial decisions (Kooij et al. 2008, Billett et al. 2011), such as providing less opportunity for training and development (Gray, McGregor 2003). Also economic considerations may influence managers’ decisions, when they assume that training an older worker is a poor investment as they will retire shortly (Gray, McGregor 2003, Billett et al. 2011). Paradoxically, social support are important for older workers’ participation in CPD (Liu, Courtenay & Valentine 2011).

Stereotypical views influence older workers’ learning and development intentions. Older workers confronted, in an experimental study, with negative stereotypic information were less motivated to learn and develop than workers confronted with positive stereotypic information (Gaillard, Desmette 2010). Self perception of age examines how old a person feels, with which age cohort one identifies and how old the person desires to be (Kooij et al. 2008, Settersten, Mayer 1997). In this view aging refers to a shift in time orientation. The Socioemotional selectivity theory (Carstensen, Isaacowitz & Charles 1999) claims that when people move through life their perception of time changes from time as open-ended to time as limited. They increasingly become aware that time is running out. This influences the selection of social goals. When aging people become mostly present-oriented and less concerned with the distant future.

Self perception of age also seems to influence peoples’ preferences for activities that support their self-concept (Kooij et al. 2008). Aging workers try to protect their self-concept, avoiding development activities that make use of fluid intelligence and preferring activities that build upon their expertise (Kanfer, Ackerman 2004). In line with this, Morgenthaler (2009) suggests that returning to school might be intimidating for nurses as people do not like to be novices again after attaining recognition as a professional in their field.

Finally, one’s self perception of age is also likely to affect self-efficacy (Kooij et al. 2008), thereby affecting older workers’ participation in CPD (Maurer 2001). Maurer (2001) argues that various processes (including a decline in social support and an exposure to age stereotypes) might negatively affect older workers’ self confidence for learning and development.

Organisational age
Older workers have often spent a substantial amount of time in a job, and even more time in an organization (Sterns, Doverspike 1989). This approach recognizes this confounding of age and job or company tenure (Schalk et al. 2010, Sterns, Doverspike 1989). Organisational age may refer to tenure and career stage.

A longer work history can have two opposite effects. Work experience can lead to an increased level of expertise (Benner 1984), which might influence workers’ preference for certain CPD activities. Novice nurses benefited from formal training,
while more experienced nurses preferred work-based opportunities like dialogue with colleagues (Daley 1999). On the opposite longer tenure might lead to deterioration of knowledge and skills. Obsolescence can be expected to increase with age (Kooij et al. 2008).

In their career workers progress through different stages. Super (1984) proposed a sequence of career stages starting with trial (characterised by identifying interests, capabilities and fit between self and work), establishment (increasing commitment to career, career advancement and growth), maintenance (maintaining self-concept, hold onto accomplishments earlier achieved) and finally decline (developing new self-image independent of career success). It should be kept in mind that nowadays career paths often do not have a linear pattern anymore. People enter and exit different life arenas at different times (Lahn 2003).

It might be predicted that CPD needs will vary with career stage. At the beginning of a career workers might need support in identifying their interests and developing their capabilities. While in late career, after doing the same task for ten or twenty years, a concentration of experience might be a problem, making it difficult for workers to learn or to change jobs (Nauta, De Lange & Görtz 2010).

**Life span age**

This approach adds that behavioural change can occur at any point in the life cycle (Sterns, Doverspike 1989, Kooij et al. 2008). Many variables may impact the aging process, such as unique career and life changes, and individual health and stress-inducing events. A possible indicator of life span age is the individual's personal situation and situation at home (De Lange et al. 2006). Exploring possible barriers for nurses to pursue additional education Morgenthaler (2009) argues that the situation at home can be a significant barrier. Going to school might not be an option for nurses who have the responsibility for older parents, while also caring for their own families. The financial situation at home might be another barrier. The life span approach stresses that more individual differences exist as people grow older (Sterns, Dooverspike 1989).

**Comparing the five operationalisations**

An underlying continuum of these conceptualisations is that age can be a characteristic of the individual (e.g. calendar age), the environment (e.g. social age in the psychosocial approach), or the person-environment interaction (e.g. tenure in the organisational approach) (Schalk et al. 2010).

A critique on these five conceptualisations of age might be that they are mainly discussed on a theoretical level and that, to our knowledge, no studies have validated the different conceptualisations and their independence. The overlap between some conceptualisations complicates the description of possible indicators. Kooij et al. (2008), for instance, used ‘skills obsolescence’ as a possible indicator of organizational age, while others (Sterns, Miklos 1995, Sterns, Doverspike 1989) discussed it under the psychosocial approach. Similarly, career stage is an indicator of organizational age (Kooij et al. 2008), or of the life span approach (Sterns, Miklos 1995, Sterns, Doverspike 1989).

Despite these shortcomings we think this framework enhances the discussion and research on issues of age and CPD. It illustrates the multidimensional process of aging and shows that these issues can be studied from different angles. It gives reason to believe that CPD of older nurses differs from that of younger workers. We therefore explored the literature to examine whether CPD of older and younger
nurses is different, in what respect, and to study which age-related factors contribute to these differences.

4. Method
We aimed to answer the research questions by carrying out a literature review. The review process consisted of the following stages:

a) Formulation of inclusion and exclusion criteria
To be eligible for inclusion in this review publications must have reported:
- on age differences in CPD
- on an empirical study or meta-analysis in a peer-reviewed journal
- in the English language.
Publications were excluded when
- only a conference abstract was available
- reporting on one age group without examining age differences,
- having an experimental design with workers participating in non-work relevant learning
- reporting on differences between generations.
We have not limited our search to a specific time frame.

b) Development of a search strategy
To develop a search strategy appropriate to the aims of this review, the following considerations were made. (1) We expected relevant studies in the nursing field to be scarce, therefore we also searched on workers in general. (2) Research on age differences takes place from two points of views. Part of the researchers is interested in age differences in CPD, while others are mainly interested in CPD of older workers and examine whether this differs from younger workers. In order to identify studies from both view points, we searched on ‘nurses-age differences-CPD’ and on ‘older nurses-CPD’. (3) Various search terms and combinations of them were listed and pilot tested. After careful consideration of the consequences of removing potential search terms, we identified the most informative search terms (see figure 2).
c) **Identification of relevant publications**

Five databases were searched: PubMed, Web of science, Scopus, Psych info and Cinahl in December 2011. We focused on title, abstract and keywords. The abstracts of found publications were screened for relevancy. If the abstract did not give sufficient information, the full text was scanned.

The search resulted in 786 unique publications, which were screened on relevancy. Of two possible relevant articles the full texts were not retrieved. Finally 26 articles met the inclusion criteria (figure 3 shows the flow chart of the review).
d) Critical analysis of the literature
The literature was reviewed using a self-devised review form. Of each study background information (research design, sample, country e.g.) and a short summary of the relevant findings were described. Then several questions were answered concerning 1) the examined age differences in CPD, and 2) the used operationalisation of age. Many studies used several indicators (e.g. tenure, marital status, calendar age), but an operationalisation of age was only marked when the study reported and analysed the results of these indicators.

Table 1 presents information on the studies found. As expected only a small number of studies (n=3) examined CPD for nurses. The others studied workers in other professions. Although not using a limiting time frame, relevant publications were only found in the years 2000-2012. Earlier studies did not met the inclusion criteria. All studies were of industrialized countries, most of Australia (n=6), United Kingdom (n=5) and the United States (n=5). Most studies (n=20) had a cross sectional design, some were longitudinal (n=2), quasi-experimental (n=1), phenomenographical (n=2) and meta-analytic (n=1). Some cross sectional studies used data from large general purpose surveys, such as the Labour Force Survey (UK), others used specific designed surveys.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Design</th>
<th>Data collection method</th>
<th>Sample</th>
<th>Country and profession</th>
<th>Age groups</th>
<th>Category</th>
<th>Operationalisations of age</th>
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</thead>
<tbody>
<tr>
<td>Lammintakanen (2012)</td>
<td>Cross sectional</td>
<td>survey</td>
<td>N= 653 (9 without age information)</td>
<td>Finland (6 hospital districts)</td>
<td>&lt;39, 40-50, ≥ 51</td>
<td>B</td>
<td>x</td>
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<tr>
<td>Tones (2010)</td>
<td>Cross sectional</td>
<td>survey</td>
<td>N = 110</td>
<td>Australia, private hospital employees</td>
<td>&lt;45, 45-55</td>
<td>A</td>
<td>x</td>
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<tr>
<td>Wray (2009)</td>
<td>Cross sectional</td>
<td>Postal survey</td>
<td>N= 510 (nurses and midwives)</td>
<td>United Kingdom</td>
<td>&lt; 50, ≥ 50</td>
<td>B</td>
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</tbody>
</table>

Studies fell in four categories: (A) motivation for CPD, (B) participation in CPD, (C) learning outcomes, (D) learning competence

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<tr>
<th>Authors</th>
<th>Design</th>
<th>Data collection method</th>
<th>Sample</th>
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<th>Age groups</th>
<th>Category</th>
<th>Operationalisation of age</th>
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<tbody>
<tr>
<td>Berg (2008)</td>
<td>Cross sectional</td>
<td>Online survey</td>
<td>N=125</td>
<td>5listerv of professionals working in field of learning and performance improvement</td>
<td>Average age 42.36 SD 10.02</td>
<td>B</td>
<td>x</td>
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<tr>
<td>Cully (2000)</td>
<td>Cross sectional</td>
<td>Data from 3 surveys between 1989-1993 Australian Bureau of Statistics of training and education and other sources</td>
<td>Not reported</td>
<td>Australia, diverse sectors &amp; jobs</td>
<td>Different age groups</td>
<td>B</td>
<td>x</td>
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<tr>
<td>Study</td>
<td>Design</td>
<td>Methodology</td>
<td>Sample Size</td>
<td>Country, Sector &amp; Professions</td>
<td>Age Range</td>
<td>Grade</td>
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<tr>
<td>De Lange et al. (2010)</td>
<td>3 wave, 3 years longitudinal study</td>
<td>Survey</td>
<td>N=1742 (T1) N=1473 (T3)</td>
<td>Netherlands, various sectors &amp; professions</td>
<td>≤30, 31-44, ≥45</td>
<td>A x x x</td>
<td></td>
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<tr>
<td>Delgoulet (2002)</td>
<td>Quasi-experimental design</td>
<td>Survey, video-observation, written knowledge tests</td>
<td>N=43</td>
<td>France, maintenance operators railway</td>
<td>25-49 ≤38, ≥39</td>
<td>C x x</td>
<td></td>
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<tr>
<td>Felstead (2010)</td>
<td>Cross sectional</td>
<td>Data from 5 surveys between 1986-2006: Social change and economic life initiative, Employment in Britain</td>
<td>N=22,000</td>
<td>UK, Diverse sectors, and jobs</td>
<td>20-34, 35-49, 50-60 (one survey 61-65)</td>
<td>A, B, C x x x</td>
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<tr>
<td>Kyndt (2011)</td>
<td>Cross sectional</td>
<td>Survey</td>
<td>N=628</td>
<td>Belgium, public health sector, diverse jobs</td>
<td>&lt;45, ≥45</td>
<td>A x x x</td>
<td></td>
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<tr>
<td>Maurer (2003)</td>
<td>3 wave, 13 month longitudinal study</td>
<td>Survey</td>
<td>N=1395 (T1) N=800 (T3)</td>
<td>USA, diverse sectors, diverse jobs</td>
<td>Mean age 43.87, SD 10.75</td>
<td>A, B x x x x</td>
<td></td>
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<tr>
<td>Maurer (2010)</td>
<td>Cross sectional</td>
<td>Survey</td>
<td>N=906</td>
<td>USA, telecommunications company, managerial jobs</td>
<td>Mean age 43.21 (SD 7.95)</td>
<td>D x x x</td>
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<tr>
<td>Newton (2006)</td>
<td>Cross sectional</td>
<td>Data from Labour force survey (Spring 2004) &amp; National adult learning survey 2002, and qualitative interviews</td>
<td>Not reported</td>
<td>UK</td>
<td>Grouped in 5 years</td>
<td>B x x</td>
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<tr>
<td>Ng (2008)</td>
<td>Meta-analysis</td>
<td>380 empirical studies, 438 samples</td>
<td></td>
<td></td>
<td>&lt;30, 31-35, 36-40,&gt;40</td>
<td>C x</td>
<td></td>
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<tr>
<td>Paloniemi (2006)</td>
<td>Phenomenographical</td>
<td>Group and individual interviews</td>
<td>16 interviews N=43</td>
<td>Finland, employees from SME’s</td>
<td>Mean age 41</td>
<td>A x x</td>
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<tr>
<td>Pillay (2003)</td>
<td>Phenomenographical</td>
<td>Interviews</td>
<td>N = 53</td>
<td>Australia, diverse jobs in medical service and transport industry</td>
<td>&lt;40 (n=16), &gt;40 (n=39)</td>
<td>A x</td>
<td></td>
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<tr>
<td>Pillay (2006)</td>
<td>Cross sectional</td>
<td>Survey</td>
<td>N=397</td>
<td>Australia, diverse jobs of local government councils</td>
<td>≤40, &gt;40</td>
<td>A x x</td>
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<tr>
<td>Schmidt (2009)</td>
<td>Cross sectional</td>
<td>Survey</td>
<td>N=301</td>
<td>US &amp; Canada, call centre services, diverse jobs</td>
<td>57% between 20-35 years</td>
<td>C x x</td>
<td></td>
</tr>
<tr>
<td>Schulz (2010)</td>
<td>Cross sectional</td>
<td>Online survey</td>
<td>N=470</td>
<td>Germany, Mail order company; diverse jobs</td>
<td>17-35, 36-50, 51-65, Mean age 38.7</td>
<td>D x x x</td>
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<tr>
<td>Study</td>
<td>Design</td>
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<tr>
<td>Thangavelu (2011)</td>
<td>Cross-sectional</td>
<td>Data from Singapore Labour Force survey 2004</td>
<td>98% of 2400</td>
<td></td>
<td>Singapore</td>
<td></td>
<td>Diverse sectors &amp; jobs</td>
</tr>
<tr>
<td>Tones (2008)</td>
<td>Cross-sectional</td>
<td>Survey</td>
<td>N= 113 (1 case deleted=112)</td>
<td></td>
<td>Australia</td>
<td></td>
<td>Government employees, different jobs (blue and white collar)</td>
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<td>Tones (2011)</td>
<td>Cross-sectional</td>
<td>Survey</td>
<td>N = 137</td>
<td></td>
<td>Australia</td>
<td></td>
<td>Local government employees (professional/managerial jobs)</td>
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<tr>
<td>Van Vianen (2011)</td>
<td>Cross-sectional</td>
<td>Survey</td>
<td>Employees: n=208, supervisors n=30</td>
<td></td>
<td>Netherlands</td>
<td></td>
<td>Diverse jobs in public city council</td>
</tr>
</tbody>
</table>

1 Studies fell in four categories: (A) motivation for CPD, (B) participation in CPD, (C) learning outcomes and (D) learning competence.
5. Results

The literature was examined to identify which issues on CPD and age differences are studied and which operationalisations of age are used. Table 1 shows that studies examined age differences in motivation for CPD (n=11), participation in CPD activities (n=12) and learning outcomes (n=4). Other studies (n=2) focused on learning competence, which seems related to cognitive abilities and will therefore be described as part of functional age.

5.1 Age differences in motivation, participation and learning outcomes

Age differences in motivation
Older workers are often seen as less willing to learn than younger workers. This seemed support by Van Vianen et al. (2011). On average, older workers were less willing to invest in learning and training than younger workers. This was, however, studied in particular situation. Workers’ motivation was defined as the attitude towards a request from the organization to participate in learning and training activities. Also Pillay (2006) found that older workers were less willing to improve their working skills and qualification compared to younger workers, but the effect sizes were low.

A longitudinal study seemed to contradict the supposed motivational difference between younger and older workers (De Lange et al. 2009). It revealed that older workers (≥ 45) reported lower motivation to learn than middle-aged workers (31-44), but not compared to younger workers (≤ 31). Middle-aged workers reported significantly more learning-related behaviour than both young and older workers.

According to lifespan theories people can strive for different goals during their lives, influenced by a reciprocal interaction between the individual and the environment. Based on these ideas Tones et al. developed a Learning and development survey to investigate workers’ selection of learning and development goals, opportunities for and constraints to learning and development at work. This survey was tested with different demographic variables in three studies (Tones, Pillay 2008, Tones, Pillay & Fraser 2010, Tones, Pillay & Kelly 2011). A study among local government workers found that older workers were less engaged in learning and development goals than younger workers (Tones, Pillay 2008). Unexpectedly, a study among nurses revealed that goals associated with decreased career involvement were linked with younger workers (Tones, Pillay & Fraser 2010). It was suggested that a large proportion of the nurses work part time, probably balancing career and family life (Tones, Pillay & Fraser 2010).

Age differences in participation
Older workers are also seen as undertaking less CPD activities than younger workers. This was contradicted by Greller (2006). Investigating hours spent on professional development, he found that people in late career were committed to invest in their development. Not age, but career motivation was associated with the hours invested. Two other studies showed that older workers participated even more in CPD activities than younger workers, especially in informal learning activities (Berg, Youn 2008, Lammintakanen, Kivinen 2012).

Most studies, however, confirmed the idea that participation in CPD decreases with age. A survey of employment experiences of older nurses in the United Kingdom showed that 73% of the sample aged 50 and over had not accessed any CPD.
activities in the last 2 years compared with 27% of the under-50, with women experiencing greater barriers than men (Wray et al. 2007). Also in other professions the incidence of training declined with age (Felstead 2010, Thangavelu et al. 2011, Urwin 2006).

Studies distinguishing middle-age and older workers, or mid and late career, showed more nuanced results. Participation rates of 45 - 54 years olds in CPD activities were not substantially lower than that of younger cohorts, while participation rates of workers above 54 years were much lower (Cully et al. 2000). Other studies reported similar results for workers above 50 years (Simpson, Greller & Stroh 2002, Taylor, Urwin 2001).

Younger and older workers could also differ in the type of CPD activity they undertook. Older workers were more likely to undertake short training courses of less than one week’s duration (Urwin 2006), or activities that develop focused occupational skills (Simpson, Greller & Stroh 2002). The youngest nurses participated least in information meetings, had less appraisals, while they participated slightly more in inservice training programs and mentoring than their older colleagues (Lammintakanen, Kivinen 2012).

Age differences in learning outcomes
The value of the same development activity may vary from person to person (Simpson, Greller & Stroh 2002).

Schmidt et al. (2009) examined learning outcomes at the level of job training satisfaction, which is workers’ feelings about the job training they received as a whole (not a single course or training programme). They found no significant correlation between age and job training satisfaction. Job tenure or experience on the job, did relate to satisfaction. Workers in the first year of employment were more satisfied than workers with a longer tenure.

In another study workers who received training, rated its impact on performance as high, but these ratings fell a little with age. For older workers training was less likely to result in a pay increase or more enjoyment of their work (Felstead 2010).

In a meta-analysis of the relationship of age to ten dimensions of job performance Ng and Feldman (2008) examined learning outcomes at the level of training performance. They found that the training performance of older workers was slightly lower than that of younger workers. It should be noted that only studies with posttraining scores on performance were included and a large proportion of the studies were on technology training (Ng, Feldman 2008).

5.2 Factors influencing age differences
The studies used different approaches to study age differences in CPD.

1) Chronological age
All studies used a chronological age approach. In order to compare results most studies divided the sample of participants in groups organised by calendar age. Some studies roughly divided the sample in two groups: older and younger workers, using a demarcation somewhere between 38 and 50 years. Others made a distinction in three (using a middle-aged group) or in more groups. Not all studies used the term older worker or mature aged worker, but used calendar age as a demarcation between workers in first and second half of career (Kyndt et al. 2011), or late career (Greller 2006).
Although all studies used calendar age as a variable, only one reported on the direct relation between chronological age and participation in CPD. Urwin (2006) argued that, when viewed from the employers’ perspective, it was not age per se, but the time an individual has left at the organization that explains the differential treatment of older workers. Raising retirement age might influence employer support for older workers. Chronological age and participation in CPD are therefore linked through the legal regulations on retirement.

2) **Functional age**
In this approach differences between younger and older workers are defined by their cognitive abilities. Three studies examined functional age, one in relation to motivation and participation in CPD (Maurer, Weiss & Barbeite 2003) and two in relation to learning competence (Maurer, Weiss 2010, Schulz, Stamov Roßnagel 2010), a concept that seems to include cognitive abilities.

CPD requires that workers possess learning competencies, which involve various dimensions (Maurer, Weiss 2010, Schulz, Stamov Roßnagel 2010). Workers should have the ability to learn new things (cognitive dimension). They should be able to recognize their strengths and weaknesses, to use strategies for planning, self-regulation and evaluation of the learning progress (metacognitive dimension). Finally it involves a learning orientation and inner work standards (motivational dimension) (Maurer, Weiss 2010, Schulz, Stamov Roßnagel 2010).

Examining learning competencies in informal workplace learning Schulz and Roßnagel (2010) found that success of informal learning was independent of age. They suggested that, while other research (Kubeck et al. 1996, Ng, Feldman 2008) found negative age differences for formal learning, ageing does not necessarily lead to a decline in informal learning competence.

In a longitudinal study among eight hundred workers a model of workers’ involvement in work-related learning and development was tested (Maurer, Weiss & Barbeite 2003). The study provided a detailed treatment of age differences and measured the effects of various age, individual, situational and motivational variables. Older workers reported feeling less cognitively able and having lower perceptions of themselves as possessing learning qualities, but this did not handicap them in overall involvement.

3) **Psychosocial age**
Fourteen studies examined indicators of psychosocial age.

**Social support**
Age differences in participation in CPD might be caused by employers who, possessing stereotypical assumptions about older workers, do not offer older and younger workers the same opportunities (Newton 2006). This seemed to be supported by Taylor and Urwin (2001) who concluded that lower incidence of vocational education and training among older workers can mainly be attributed to employer decision making. Also Tones et al. (2008) found that workers over 45 years reported fewer opportunities for learning and development at work, with a stronger effect for blue collar than for white collar workers.

Labour economic models suggest that older workers are less likely than younger workers to receive employer’s support when making human capital investments (Simpson, Greller & Stroh 2002). High costs, related to productivity loss during training, and the expected short pay-back period lead to these lower investments. Addressing this hypothesis Simpson et al. (2002) found no significant
differences. Older and younger workers received the same support. It should be noted that the results were for workers who participated in some developmental activity (Simpson, Greller & Stroh 2002). In line with these results, De Lange et al. (2009) did not find significantly lower levels of supervisory support for older workers than for the other age groups.

Surprisingly, three studies reported lower levels of employer support for younger workers. Younger workers reported more employers’ reluctance to offer training (Felstead 2010), more experiences of injustice in terms of CPD (Lammintakanen, Kivinen 2012) and perceived less organizational support (Pillay, Kelly & Tones 2006) than older workers.

**Self perception**

In the earlier described longitudinal study Maurer et al. (2003) used two alternative age measures: subjective age (how old an individual perceives him- or herself) and perceived relative age (the perceived age of an individual compared with others in the workplace in terms of how they look, feel and act). Perceived age, and not subjective age, proved to be distinguishable from chronological age. Perceived relative age was negatively related to work support. Maurer et al. (2003) suggested that being older in a young group might lead to less support and encouragement, and pleaded for attention in the workplace to employees' relative age and not just chronological age.

Aging workers they try to protect their self-concept (Kanfer, Ackerman 2004). Therefore, some learning activities might lead to greater anxiety for older workers, when they perceive a gap between their capabilities and the requirements of the learning activity, depending on what is at stake for them (Delgoulet, Marquié 2002). Studying a vocational training course Delgoulet and Marquié found that the older the trainee, the greater the state (context-related) anxiety related to the training content. This anxiety had no significant effect on the performance of older trainees as measured by two tests.

Finally, workers’ motivation for CPD depends on their beliefs about the malleability of human abilities. Van Vianen et al. (2011) found that these beliefs moderated the relationship between age and training and development willingness. Age was negatively related to training and development willingness for workers who believed that human abilities are fixed rather than incremental.

4) **Organisational age**

Thirteen studies examined indicators of organisational age: career stage and tenure. Tenure and chronological age seemed to be highly interrelated. Both Maurer et al. (2003) and Van Vianen et al. (2011) reported that age effects, when controlled for tenure were no longer significant.

More years of experience appeared to relate to motivation for and participation in CPD. Accumulating skills and experience negatively influenced the perceived need for CPD (Felstead 2010, Cully et al. 2000). Older workers perceived a training deficit to be of less consequence in terms of requirements of the job and the enhancement of the prospects of promotion, than for those aged less than 50 years (Felstead 2010). Kyndt (2011) showed that for experienced workers the feeling they had learned enough caused a barrier for participating in CPD, while less experienced workers were more stimulated by professional and personal development, they wanted to learn, to progress in their job and were curious.

On the other hand, work experience was also reported to be helpful in focusing on relevant information, understanding theoretical knowledge, and maintaining and
increasing one’s learning motivation (Paloniemi 2006). More experienced workers might increasingly recognize the need to learn and develop new skills and knowledge (Maurer, Weiss 2010).

Also career stage seemed to be of influence. De Lange et al. (2009) suggested that older workers might have a reduced time perspective, have reached the highest position in the organisation, and do not have options for job transfer, resulting in lower learning-related behaviour.

5) Life-span age
Several studies included indicators of life-span as a variable, such as care giving duties due to having children or other care-needing persons at home (De Lange et al. 2009) and marital status (Maurer, Weiss & Barbeite 2003). Only three studies reported findings on the relationship between family situation and CPD. One study showed that married women with children were less likely to participate in training programmes, but these results were not significant (Thangavelu et al. 2011). In a study on stimulating and prohibiting reasons for participation in learning activities, Kyndt et al. (2011) found that younger workers (<45 years) are discouraged by the required investments (e.g. distance, costs, time) of learning activities. They suggested that younger workers are more likely to have younger children, reducing their amount of spare time (Kyndt et al. 2011).

6. Discussion
This study reviewed the literature to examine whether CPD of older and younger nurses is different and in what respect. The first finding is that to date research on age differences in CPD is limited in the nursing field, as well as among workers in general. We found 26 relevant empirical studies, reporting on age differences in motivation, participation and learning outcomes. The available evidence showed equivocal results. In general older workers seemed less likely to participate in CPD, especially when considering formal CPD activities and workers in late career (older than 50/55 years). No clear age pattern were found for motivation and learning outcomes.

Research on age differences in CPD showed to be conceptual diverse. Several studies examined a broad concept of CPD, while others examined specific learning activities. However, age and work experience might influence preference for certain learning activities. This could be a reason why studies examining primarily informal learning (Berg, Youn 2008, Lammintakanen, Kivinen 2012) found a positive correlation between age and participation, while others examining more formal forms of CPD (Felstead 2010, Thangavelu et al. 2011) found a negative correlation. At first glance these findings might seem contradicting, closer scrutiny reveal that it might reflect age differences in preferred learning activities.

An important finding was that more nuanced results were found when distinguishing at least three age groups and not just younger and older workers. The results give reason to believe that mid career may be quite different from late career (Simpson, Greller & Stroh 2002, Ng, Feldman 2008).

A second aim of the study was to disclose the factors contributing to these age differences. The framework was helpful as it illustrated that age differences in CPD are studied from different angles. The results showed that all studies used chronological age as a variable. Besides, age differences were mostly studied from a psychosocial (14 studies) and an organizational perspective (12 studies). Psychosocial age and organizational age seemed to be negatively associated with
motivation for and participation in CPD. This is in line with Maurer et al. (2003) concluded that age negatively affected various individual and situational variables that help to enable or predispose a worker for CPD.

Less studies examined indicators of functional (3 studies) and life span age (3 studies). The effect of functional age was therefore less clear. Research on age and cognitive abilities focused yet mainly at formal modes of learning and less at informal workplace learning (Schulz, Stamov Roßnagel 2010). Also the effect of life span age was less clear. It seemed that home situation can be a barrier for especially younger workers to participate in CPD.

When interpreting the results, three limitations should be considered. First, the limited number of empirical studies, the diversity in study populations, and the often used methodology relying on self-reports limit the possibility to draw strong conclusions.

Second, it should be realized that cultural differences between countries may complicate comparison of the results. Especially social perceptions of older workers might be culturally influenced, and CPD opportunities for older workers in Northern European countries might be better than in other industrialized countries (Billett et al. 2011).

Finally, as we were interested in age differences, we examined group-level differences between workers at one age and workers at another age. We were not studying the ageing process, that is the intra-individual changes that occur over time. Therefore, it is not possible to disentangle cohort-effects from age-differences. Age-differences in CPD found nowadays do not have to be found in the future. The gap between younger and older workers was shown to have become smaller over the years (Felstead 2010, Cully et al. 2000). Increasing attention to lifelong learning skills in education, growing attention to CPD by workers and employers and the shift of the retirement age might reduce this gap even more in the future.

Despite these limitations the strength of this study is that it is one of the first reviews of age differences in CPD. By using five operationalisations of age a comprehensive overview of age-related issues in CPD is given and gaps in current research could be identified. This gives input for a research agenda for future studies on age differences in CPD.

Suggestions for further research
Further research in the nursing field is needed. We found only a limited number of relevant studies on CPD of nurses. And although it will be difficult not to recognize the relevance of the findings of studies on other workers, more research on age differences in nurses’ CPD is needed to be able to better adapt CPD approaches to their needs.

Besides, additional research using a longitudinal design is necessary. It will give more insight in intra-individual differences; does the motivation for, participation in and learning outcomes of CPD change when nurses grow older? The present studies only suggest that there are differences, but it can not be inferred if these are caused by cohort effects or the aging process.

More research is also needed on learning outcomes. Only four studies focused on this issues. Research on age differences in learning outcomes seems to be limited to experimental or laboratory designs where workers do not learn real-work tasks. Assessing learning outcomes in CPD, in the professional context of workers, might give a more accurate view on whether older nurses learn as much as younger
nurses in CPD activities. In line with this, additional attention should be given to the effects of cognitive aging on CPD.

Finally, additional research is needed on the effects of home situation on participation in CPD. Only three studies focused on life span age. Particularly for nurses, of which the majority is woman and might have care duties at home, the home situation might influence participation in CPD.

In line with others (Sterns, Doverspike 1989, De Lange et al. 2009) we find lifespan theoretical perspectives particularly useful to guide further research on age differences in CPD. These theories recognise both inner changes (e.g. biological and psychological) as well as the effects of external forces on individuals and groups (e.g. sociological changes for cohorts) (Kanfer, Ackerman 2004). They emphasize individual differences in aging. A relevant theory might be the Socioemotional selectivity theory (Carstensen, Isaacowitz & Charles 1999), which posits that the changing perception of time influences the selection of social goals. Also relevant might be the Selection, Optimization and Compensation (SOC) theory (Baltes, Staudinger & Lindenberger 1999), which underlines differences in the way people allocate resources to various goals of development across the life span.

According to these theories workers may have different motives in different phases of their lives. Knowing these motives might help to better support workers in their learning and development during different phases of their lives and careers.

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