



## Original article

## Nurses, age, job demands and physical activity at work and at leisure: A cross-sectional study



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## ABSTRACT

**Background:** The nursing workforce is ageing and increased age and demands at work, can impact on physical activity levels in the workplace and at leisure. Research has shown that work physical activity, without activity at leisure, is insufficient to prolong well-being. This study investigated the physical activity levels of a sample of nurses and aimed to determine if age and job demands are associated with engaging in recommended physical activity levels at work and at leisure.

**Methods:** A cross-sectional study was conducted with data collected during 2016. Two-hundred and ten nurses participated in the study. Two validated instruments were used: the Copenhagen Psychosocial Questionnaire (quantitative and cognitive demands) and the International Physical Activity Questionnaire.

**Results:** Older nurses ( $\geq 40$ -years) were significantly less likely to report engaging in recommended physical activity levels at work than younger nurses [OR 0.47, 95% CI (0.25–0.88)  $p = 0.02$ ]. Nurses with high quantitative demands were over twice as likely to engage in recommended levels of physical activity at work and at leisure. Engaging in recommended levels of physical activity at work was not associated with leisure-time physical activity reports.

**Conclusion:** Initiatives need to be put in place to ensure older nurses can fulfil their nursing role within their capabilities. These could include offering personal physical activity education to both on and off-duty nurses. Assessment of ability and patient acuity may be necessary.

## 1. Background

Studies have shown nurses to walk up to five miles in a 10-h day-time shift with less physical activity recorded on night shifts and days off (Hendrich, Chow, Skierczynski, & Lu, 2008). However, despite this, nurses have been found to have less than adequate physical activity levels (Bakhshi, Fei, Murrells, & While, 2015). Further, physical activity at work, may not contribute the positive effect on health that activity at leisure can (Henwood, Tuckett, & Turner, 2012).

A body of work has emerged, over the last number of years, highlighting the difference between occupational physical activity and leisure-time physical activity and the beneficial effects these could bestow on health (Holtermann, Burr, et al., 2012; Holtermann, Hansen, Burr, Sogaard, & Sjøgaard, 2012). The research around occupational physical activity levels in relation to engaging in leisure-time physical activity varies. Low work physical activity was found to be associated with lower leisure-time activity by some scholars (Ekenga, Parks, Wilson, &

Sandler, 2015). Others found high occupational physical activity to result in less leisure-time activity (Holtermann, Marott, et al., 2012). Further and conversely, Lallukka et al. (2004) found physically strenuous work to be associated with increased leisure-time physical activity for women. Clear associations have been found for male workers between high work physical activity and increased risk of all-cause mortality but the associations are not so clear for females (Holtermann, Burr, et al., 2012). Workers reporting high strain jobs (high job demands and low job control) have been found to be more physically inactive (Kouvonen et al., 2013) but this seems to be driven by the control these workers have in their job rather than their job demands. Nonetheless, for a nursing workforce, high job demands but not job control was found to be associated with regular aerobic physical activity (Chin, Nam, & Lee, 2016).

Adults are recommended to get at least 30 min physical (moderate) activity on 5 days a week (150 min a week) (Department of Health, 2016). Although self-reports of activity levels by means of validated

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instruments are fraught with bias (recall bias, social desirability bias) they remain an important method of assessing physical activity. Nevertheless, subjective physical activity data can vary quite significantly from objective data (Prince et al., 2008; Yu et al., 2015). Previous work, using subjective measurements for physical activity levels in nurses, found higher average activity scores than that recommended (Kaewthummanukul, Brown, Weaver, & Thomas, 2006). However, other scholars found less, even insufficient physical activity levels for nurses (Albert, Butler, & Sorrell, 2014; Chin et al., 2016). These studies used different instruments for their measure of physical activity, perhaps resulting in different findings.

It has been widely acknowledged that inactivity increases with age (Hallal et al., 2012). A physically demanding job does not allow for a reduction in activity levels and older nurses feel challenged by the physical demands of their role (Clendon & Walker, 2013; Fragar & Depczynski, 2011). An association between physical workload and job strain has been shown previously, with nurses who work in accident and emergency and medical wards having higher levels of perceived stress from physical workload (McCarthy, Power, & Greiner, 2010). Other scholars found occupational factors to be significant contributors to physical inactivity and obesity for nurses (Chin et al., 2016). Therefore, the workplace of the nurse is important in relation to their perceived stress levels, physical inactivity and body mass index. Rotation to a less physically demanding area can positively impact on the older nurse's job satisfaction (Moseley, Jeffers, & Paterson, 2008), however this is not always possible.

Little is known about any difference in the age groups of nurses and their physical activity levels at work or leisure. This issue is gaining more importance with our population of ageing nurses. Figures in 2010 showed 20% of the nursing/midwifery workforce in Ireland were in the 50–59 year age bracket (Irish Nurses and Midwives Organisation, 2010). A national survey of nurses working in medical and surgical wards in acute hospitals reported 32% of respondents were < 30 years of age, 44% were 30–39 and 25% were 40–59 with 1% over 60 years of age (Scott et al., 2013). Details from the Nursing and Midwifery Board of Ireland (2016) show only 38% of those on the Active Register (of nurses and midwives) are under 40 years of age with over half (53%) forty to fifty-nine years old. This implies that our nursing workforce is older. Exploring the association between nurses' age and demands at work is particularly important if a healthy workforce is going to be maintained.

There is a need to examine the demands on the worker particularly in relation to the amount of work they need to complete and the decisions and skills required for this work. This needs to be examined in relation to both work and leisure-time physical activity levels because of recent evidence showing a clear difference between engaging in these and cardiovascular disease (Li, Loerbroks, & Angerer, 2013). The use of the Copenhagen Psychosocial Questionnaire (Kristensen, Hannerz, Hogh, & Borg, 2005) which reflects today's work environment will allow a clearer picture to be obtained by differentiating between quantitative demands (amount of work to be done) and cognitive demands. Physical activity levels do not always determine ability to conduct physical work. However, previous researchers have postulated that the discrepancy between the nurse's physical capability and their physical job demands grows with age and have found musculoskeletal disorders in middle-aged nurses (35–44 years) due to physical job demands (Heiden, Weigl, Angerer, & Müller, 2013). This could result in a premature degenerative process which may impact on the nurse's physical activity levels at work and leisure. Physical activity at work has been defined by some researchers as walking and heavy lifting and this classification of physical activity was found to be associated with risk of lower back pain (Heuch, Heuch, Hagen, & Zwart, 2017). For the purpose of this present study, physical activity levels included activities that take moderate or hard physical effort and make the nurse breathe somewhat or much harder than normal (IPAQ Research Committee, 2005).

Work physical activity alone is inadequate to prolong well-being; engagement with leisure-time physical activity is necessary (Henwood et al., 2012; Li et al., 2013). There is a paucity of research relating to older nurses and engagement with work and leisure-time physical activity separately. Additionally, research addressing how today's job demands (quantitative and cognitive demands) relate to activity levels at work and leisure is lacking and findings are inconsistent when available. Therefore, the purpose of the present paper is three-fold. Firstly; to investigate the physical activity levels of a sample of nurses at work and at leisure; secondly to determine if age and/or perceived job demands are associated with physical activity levels at work and at leisure and thirdly; determine if engaging in recommended physical activity levels at work resulted in lower activity levels at leisure. Recommended physical activity levels at work are defined as 150 min a week and this was motivated by previous research on health professionals (Kovacheva & Tsen, 2018). Recommended leisure-time physical activity levels were defined similarly. The hypotheses of the study were:

**Hypothesis 1.** Older nurses ( $\geq 40$ -years) engaged in less than recommended physical activity levels at work and at leisure than their younger counterparts.

**Hypothesis 2.** Nurses who reported high quantitative demands engaged in recommended levels of physical activity at work but had less than recommended leisure-time physical activity.

**Hypothesis 3.** Nurses who reported high cognitive demands had less than recommended levels of physical activity at work but engaged in recommended leisure-time physical activity levels.

**Hypothesis 4.** Nurses with recommended work physical activity levels had less than recommended leisure-time physical activity levels.

Firstly, we established the age and job demands of our nurses and then how those factors were associated with work and leisure physical activity levels separately. This is an important consideration with our ageing nurses and for healthcare organisations who need to plan for the safe working conditions and maintenance of high quality practice.

## 2. Methods

### 2.1. Design

A cross-sectional study was conducted with a sample of qualified nurses recruited from two hospitals in the Southern part of Ireland. The sample was representative of qualified nurses within the target population. Data were collected during 2016. A two-stage sampling approach was taken. The first stage involved the selection of different work areas within two teaching hospitals. The work areas included were; medical, surgical, medical/surgical, paediatrics, emergency departments, intensive care, coronary care, operating theatre, outpatient department and other (care of the elderly and orthopaedics). The second stage involved the random selection of a sample of nurses from each of these work areas.

### 2.2. Respondents

Nurses were randomly selected from the nursing off-duty (work roster) using a random generator application. The sample included staff nurses (registered nurses), junior nurse managers (Clinical Nurse Managers 1 (CNM1s)) and senior nurse managers (Clinical Nurse Managers 2 (CNM2s), Clinical Nurse Managers 3 (CNM3s)). All qualified nurses working part or full-time were eligible to be included in the sample. In total 300 nurses were invited to participate in the study. This sample size was seen to be representative of nurses working in the teaching hospitals although data on total numbers of nurses working in the sampled hospitals were not available. A response rate of 70% was obtained ( $n = 210$ ) however only  $n = 203$  of the returned

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