Focus on sleep and older people

Introduction
On 5 June 2014, BBC News reported that researchers had identified the mechanism through which sleep improves memory and learning function (BBC News, 2014). The new research is a reminder of the benefits of healthy sleep patterns among older people. Long-term sleep loss can be associated with an increased risk of a number of adverse health outcomes including diabetes, heart disease, cardiovascular disease and stroke (Miller, Wright, & Cappucio, 2013).

This edition of the CARDI “Focus on . . .” series examines the issue of sleep among older people, looking at health issues, treatments and implications for policy and practice.
Key findings

- 12% of people aged 65 and over in the Republic of Ireland (ROI) have trouble falling asleep while 17% experience waking up too early (TILDA, 2011).

- The English Longitudinal Study on Ageing shows that long sleep duration (8 hours or more) increases with age (particularly among people aged 75+) while sleep disturbance reduces with age (Kumari, Green, & Nazroo, 2010).

- Research shows that long-term sleep loss can be associated with an increased risk of type-2 diabetes, coronary heart disease, cardiovascular disease and stroke. Sleep also has important effects on memory, co-ordination and executive functions (Miller, Wright, & Cappucio, 2013).

- A study of community-dwelling adults across Europe found that it is not ageing per se that reduces the ability to fall asleep, but underlying conditions that are more common in older populations (Dowson et al., 2008).

- Cognitive behavioural therapy has been shown to be a successful alternative treatment to medication for chronic insomnia (Robotham, 2011).

- The standards for nursing homes in either ROI or Northern Ireland (NI) do not contain any standard or guideline on sleep quality or sleep disturbance for residents (Health Information and Quality Authority, 2009) (Regulation and Quality Improvement Authority, 2008).

Understanding sleep disturbance

Sleep is necessary for good health at all stages of life. While in general some changes in sleep and sleep patterns are part of normal ageing, the need for restorative sleep is not dependent on age. Normal changes to sleep patterns should not cause personal dissatisfaction with quantity or quality of sleep (Dowson et al., 2008).

Changes to sleep patterns which affect quality of sleep or disrupt a normal sleep cycle are known as sleep disturbances. It is sleep disturbances that have an adverse effect on health and quality of life. While research on sleep has traditionally examined the effects of sleep quantity, a more recent distinction incorporates the effect of sleep quality. For example, the Irish Longitudinal Study on Ageing (TILDA) survey focused on sleep disturbance as opposed to the number of hours slept.
Figure 1 illustrates the factors which can cause sleep disturbance in older people, which can be behavioural, environmental, emotional, medical or related to medication. It is important to note that causes of sleep disturbance in older people tend to be multi-factorial (Kilgore, 2013).

Figure 1: Factors causing sleep disturbance in older people

Sources: Adapted from Kilgore (2013) / Li, Chang, & Porock (2014) / Arber et al. (2013)

In the UK *Psychiatric Morbidity Survey*, sleep problems were found to be strongly associated with socio-economic disadvantage, such as having a low income, lacking educational qualifications, living in poor housing and not being in paid employment (Arber et al., 2013). The stress and anxiety associated with living with the consequences of socio-economic disadvantage are likely to cause an increase in sleep problems – US research indicates that stress and worry is the most common cause of insomnia (National Sleep Foundation, 2013).
Sleep disruption data

TILDA included a question on sleep disruption – whether or not older adults had trouble falling asleep or were waking up too early. The findings indicate that ageing is not necessarily associated with poor or disrupted sleep as similar levels of sleep disruption were reported in all age groups. Figure 2 shows the incidence of sleep disruption by age group.

Figure 2: Sleep disruption by age group in ROI

TILDA results show that older adults suffering from depression have higher rates of sleep disruption than the general population. 33% of respondents with depression had trouble falling asleep, compared to 7% without depression. Similarly, 38% of respondents with depression had trouble with waking up too early compared to 12% with no depression (TILDA, 2011). This suggests that sleep disturbance is more strongly associated with secondary sleep disorders, i.e. disorders caused by other conditions indirectly inhibiting sleep, than with age. A study of community-dwelling older adults across Europe found that it is not ageing *per se* that reduces the ability to fall asleep, but underlying conditions that are more common in older populations (Dowson et al., 2008).
While no comparable data exist in NI, a 2001 study of adult men in NI aged 18-91 years old showed that 25% of the population had insomnia and 20% had excessive daytime sleepiness. Excessive daytime sleepiness was reported by 15% of people aged younger than 35, 24% of people aged 35-64 and 18% of people aged 65 or over (Nugent et al. 2001). A Boston College international study of sleep deprivation among children aged 9-10 showed that 62% of children of that age group in ROI taking maths and science tests were sleep deprived, well above the international average of 47% (BBC News, 2013).

The English Longitudinal Study on Ageing (ELSA) characterises poor sleep quality using three distinct measures: short sleep duration, long sleep duration and sleep disturbance. The findings show that long sleep duration (8 hours or more) increases with age while sleep disturbance reduces with age (Kumari, Green, & Nazroo, 2010). Figure 3 shows the percentage of men and women who were in the quartile of the ELSA study respondents who were most sleep disturbed. As can be seen, sleep disturbance does not increase by age but women are much more likely to be in the most sleep disturbed quartile than men.

![Figure 3: Percentage of men and women in the most sleep disturbed quartile in ELSA](image)

Source: (Kumari, Green, & Nazroo, 2010)
A 2013 panel survey conducted across Great Britain and NI showed that in NI, 31% of people only get between 5-6 hours of sleep per night, whilst 14% get under 5 hours of sleep per night (The Sleep Council, 2013). A study of a British cohort aged 45-90 years showed that there were 63% of men reporting that they had never experiencing difficulty falling asleep compared to 40% of women. Early awakening was the most common sleep complaint, reported by 12% of men and 15% of women (Leng, et al., 2014).

Sleep problems and health

Although there are around 90 distinct sleep disorders, according to the International Classification of Sleep Disorders, most are marked by one of these symptoms: excessive daytime sleepiness, difficulty initiating or maintaining sleep, or abnormal movements, behaviours, and sensations occurring during sleep (Colten & Altevogt, 2006).

Research shows that long-term sleep loss can be associated with an increased risk of type-2 diabetes, coronary heart disease, cardiovascular disease and stroke. Sleep also has important effects on memory, co-ordination and executive functions (Miller, Wright, & Cappucio, 2013). A European study on insomnia showed that the condition had a negative impact on quality of life, and the degree of impairment in quality of life was directly related to the severity of insomnia (Chevalier et al., 1999).

Among older people, untreated chronic sleep disturbance degrades quality of later life, inhibits recovery following illness and rehabilitation, and is an independent risk factor for falls and depression (Arber et al., 2013). A study from Taiwan indicates that for patients with non-apnoeic sleep disorders, the risk of cancer is increased, particularly liver and lung cancers (Hu, et al., 2013).

An article from NHS choices indicates that getting a poor amount of sleep on a regular basis puts people at risk of serious medical conditions including obesity, heart disease and diabetes. It also weakens the immune system and shortens life expectancy (NHS Choices, 2013). When a person sleeps less than seven hours a night there is a dose-response relationship between sleep loss and obesity: the shorter the sleep, the greater the obesity, as typically measured by body mass index (Colten & Altevogt, 2006).

Sleep in long-term residential care

Older people in long-term residential care face particularly acute problems with sleep – night-time insomnia, daytime sleepiness, abnormal sleep-wake patterns and other sleep problems are common in care homes. One study suggests that 67% of older adults in long-term care have difficulties sleeping. This is as a result of the increased incidence of chronic conditions causing sleep disturbance but can also be attributable in a smaller way to environmental factors such as increased noise and nursing care requirements at night time (Dowson et al., 2008).
Poor sleep in residential care have been shown to be associated with declining functional status, worse health-related quality of life, and greater depression (Kilgore, 2013). One study of residents in a US nursing home found that 71% were sleeping more than two hours during the day, and this was significantly associated with residents’ comorbidity, cognitive performance, activities of daily living and social involvement (Li, Chang, & Porock, 2014).

Both the physical environment and practices in care homes can affect residents’ sleep and night-time experience (Ellmers et al., 2013). In one randomised, controlled trial of residents in four Los Angeles area nursing homes, the group who received several lifestyle and environmental interventions experienced decreases in daytime sleeping and the duration of night-time awakenings. The intervention consisted of five consecutive days and nights of efforts to:

- Decrease time in bed during the day
- Give at least 30 minutes of daily sunlight exposure
- Increase physical activity
- Structure a bedtime routine between 20:00 and 22:00
- Minimise awakenings
- Decrease night-time noise and light in hallways and rooms

In addition to the decrease in daytime sleeping, residents who received the intervention were significantly more engaged in social and physical activities than others. The study participants were long-stay residents with significant co-morbidities and cognitive and functional impairments (Alessi et al., 2005).

Published in 2009, the Health Information and Quality Authority’s National Quality Standards for Residential Care Settings for Older People in Ireland govern the inspections of residential care facilities in ROI. The standards set out guidance for monitoring of patients who have been given sleep medications, but do not otherwise include any guidance on sleep quality for residents. The standards do note that routines, including meal-times and bed-times, should suit the resident’s expectations and preferences (Health Information and Quality Authority, 2009).

The Regulation and Quality Improvement Authority in NI performs a similar inspection function. Nursing Homes: Minimum Standards outlines the standards that nursing homes must adhere to on inspection. As in ROI, sleep quality or addressing sleep disturbance are not included in the standards for nursing homes in NI (Regulation and Quality Improvement Authority, 2008).
Alternatives to medication

There are concerns about some current treatment practices for poor sleep, e.g. the prescription of hypnotic drugs which increase confusion and falls among older people (Arber et al., 2013). It has been suggested that while 10% of the population in Great Britain suffers from insomnia, medication is the only treatment available on the NHS (Loughborough University, 2013).

While sleep disturbance tends to be caused by a number of factors and treatment focuses on underlying conditions, several new and developing treatments can be effective.

Cognitive behavioural therapy for insomnia

This therapy involves giving patients the tools and techniques to develop their own psychological approaches to sleep management. It aims to improve sleep habits and behaviours by identifying and changing the thoughts and the behaviours that are affecting the ability to allow the person to sleep or sleep well. The technique has met with some success in trials. For example, one UK study provided volunteers with six booklets by post, one for each week of the trial, which explained the principles of cognitive behavioural therapy and provided self-help techniques to improve sleep. A telephone hotline was made available, and the group which could avail of the cognitive behavioural therapy was shown to have improved sleep quality after the trial and three and six months later (Arber, 2010).

A UK joint initiative between the Loughborough University Clinical Sleep Research Unit (CSRU) and Nottinghamshire Healthcare is aiming to reduce prescriptions for sleeping tablets by improving access to cognitive behavioural therapy. GP services and local pharmacies are involved in the initiative whereby patients can get access to cognitive behavioural therapy as an alternative to medication (Loughborough University, 2013).

Light exposure

Sleep problems and decreased daytime alertness among older people may be caused in part by a dysfunction of the circadian body clock. Medication is currently the only option to treat these sleep disorders. However, research shows that administration of bright light has the ability to reduce sleep problems, and can also enhance daytime performance. The best means for older people to benefit from bright light is to maximise daylight exposure. This is true for older people living in the community, but also particularly true in residential care where staff should be ensuring that older residents are sufficiently exposed to daylight.

Ageing is accompanied by many changes within the eye including alterations in pupil size, lens transmission, and the number of retinal photoreceptors. Older people thus require more light than younger
people. If daylight exposure is not possible, the use of short wavelength blue light has shown some promise in treating sleep disorders, though further research is needed to determine the ideal conditions for exposure to the light (Arber, 2010).

**Assistive technologies**

Advances in areas such as telecare and telehealth may lead to widespread access for older people to sophisticated health monitoring and new technologies in the home for assisted living (Breen, 2013). Some of these assistive technologies may have applications in improving sleep quality for older people. In residential care, automatic lighting and remote monitoring can minimise disruption to the sleep of older people. In the community, smart home technology can adapt to the needs of older people and provide the optimal ambient conditions for sleep in terms of temperature, light and noise.

Smartphones and tablet apps can improve sleep patterns and sleep quality through guided meditation, sleep cycle trackers and alarms, or work in tandem with smart pedometers to track physical activity and sleep duration throughout the night (Burtchell, 2014). However, the use of smartphones, tablets and laptops before sleep has been associated with poorer sleep outcomes. It is thought that the bright light-emitting diodes that allow the use of mobile devices in dimly lit rooms can interfere with melatonin, a hormone that helps control the natural sleep-wake cycle (Mayo Clinic News Network, 2013).

**Policy on sleep issues**

Public health practitioners and other health care providers have not focused major attention on the importance of sleep to health (Perry, Patil, & Presley-Cantrell, 2013). It is important that sleep quality as a public health issue is promoted, increasing awareness to both the general public and health professionals of the importance of sleep (Miller, Wright, & Cappucio, 2013). The doctor-patient relationship is vital in ensuring that sleep disturbances are correctly diagnosed and treated. In a Europe-wide study, Chevalier et al. (1999) notes that individuals with severe insomnia also showed a higher level of healthcare consumption. Despite this, severe insomnia did not appear to feature prominently in the doctor-patient relationship (Chevalier, et al., 1999).

Similarly, a survey of sleep across the UK showed that just one in ten people had consulted their doctor about sleeping poorly, yet three times this number (31%) had taken medication in an attempt to relieve the problem (The Sleep Council, 2013). Health professionals need evidence-based information on the importance and benefits of sleep and to be able to recognise sleep problems in primary care. Given the indications on the success of cognitive behavioural therapy for insomnia, this treatment could be included in guidelines for health professionals and implemented as interventions (Robotham, 2011).
The UK National Child Development Study revealed that people reporting sleep disturbance at age 16 were also more likely to report sleep disturbance at age 42, suggesting that a pattern of insomnia early in life continues over several decades (Arber, 2010). With large numbers of children showing signs of sleep deprivation, the problem could be increasing and early intervention for those at risk may be the best approach to ensure better sleep quality later in life.

**Conclusion**

Sleep disturbance has a significant effect on the health of older people. Yet it is under-appreciated as a public health concern and does not feature heavily as part of the relationship between older people and health professionals. This is in part due to the fact that underlying conditions are often responsible for sleep disturbance. Raising awareness of the issues and implications among the general public, health professionals and residential care professionals is an important step. This could include guidelines on the use of cognitive behavioural therapy instead of medications where applicable. Ensuring sleep quality should also be part of the standards and guidelines for long term residential care for older people in NI and ROI. While changes in sleep patterns are normal as we age, the need for a healthy level of sleep is not dependant on age.

**Bibliography**


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