

## **Translating health promotion knowledge to self-care: healthy eating and weight management for nurses.**

Holly Blake<sup>1,2</sup>

<sup>1</sup>School of Health Sciences, University of Nottingham, Nottingham, UK.

<sup>2</sup>NIHR Biomedical Research Centre, Nottingham, UK.

\*Author's Accepted Version.

### **Abstract**

Promoting health at work is a national public health priority. Nurses are educated in, and practice, health promotion but this knowledge does not always translate to self-care. There are high rates of overweight and obesity in nurses, with implications for their health and wellbeing and potentially patient care quality. Barriers to healthy eating exist at the individual and organisational level. Healthcare organisations and educational institutions should seek to address individual and structural barriers to healthy eating through providing education, challenging social norms, establishing workplace health programmes, policies and practices that support healthy behaviours.

### **Promoting health at work**

Health is defined here as a state of balance that an individual has achieved between themselves and their environment. This fluid definition of health assumes that a person is healthy if they get the most out of life that they can, irrespective of whether they have a disease or impairment (Sartorius, 2006). Health promotion is the process of enabling people to increase control over, and to improve, their health. While health promotion includes educating people about health and the factors that influence it, it goes beyond didactic health education by targeting not only individuals, but their environments (de Vries et al, 2018). Broadly, it is achieved by improving public health policies, creating supportive environments that contribute to better health (e.g., through incentivisation of healthy choices, and making unhealthy choices more difficult, such as through taxation or restricted access), strengthening social networks and enhancing health literacy (i.e., the ability of individuals to find, understand and use information and services to inform health-related decisions and actions). Promoting health is a dynamic process that occurs at the *micro* (individual), *meso* (organisational) and *macro* (national or international) level (de Vries et al, 2018). The *meso* level includes workplaces as 'settings' for health promotion. Promoting health through the workplace can include making changes to the physical environment to make healthy

behaviours an easier choice or using the workplace as setting through which to access groups of individuals to deliver health promotion interventions.

Promoting health in any workplace setting has been a national and international priority for many years. In 1986, at the first International Conference on Health Promotion, meeting in Ottawa in Canada, a charter for action was established to enable health for all people by the year 2000 and beyond. This charter stated that "Health is created and lived by people within the settings of their everyday life; where they learn, work, play, and love." Examples of 'settings' include schools and universities, worksites, hospitals, villages, and cities. Based on the Ottawa Charter, and subsequently, the World Health Organization strategy in 1980 of 'Health for All' (indicating the need to bring health within the reach of all populations), the 'Healthy Settings' movement was borne. With the rising prevalence of people living with ongoing chronic disease, it is still as relevant today, if not more so.

In the public sector, health and care professionals have made a collective commitment to the national Health and Work agenda, marked by the 2019 Healthcare Professionals' Consensus Statement on Health and Work (AOMRC, 2019), which was agreed by the Academy of Medical Royal Colleges, the Royal College of Nursing, and the Allied Health Professions Federation. This includes a statement for action to ensure that healthcare professionals understand (a) the relationship between work and health, in terms of the value of 'good work' (i.e., fulfilling work that provides job satisfaction and allows people to reach their potential) to health and wellbeing, (b) the long-term negative impacts of health-related worklessness (i.e., not being in employment due to their health) and (c) the need to work together to support others to remain in, and thrive at, work (e.g., engaging with other systems and stakeholders involved in supporting people who are not at work for health-related reasons, such as occupational health services). Importantly, this statement includes a call to action for healthcare professionals to "recognise their own role to support healthy and safe working environments, looking after their own health and wellbeing and those of their colleagues" (AOMRC, 2019).

### **Knowledge about health promotion doesn't always translate to self-care.**

Health promotion is a central part of the nursing role. In the UK it forms part of the current proficiencies for registered nurses, with a need for the nurse to understand and apply the aims and principles of health promotion, protection, and improvement, together with the prevention of ill health when engaging with people (NMC, 2018). However, a nurse's knowledge about health promotion may not always translate into self-care (Ross et al, 2017).

Obesity, for example, is a significant public health concern. It is a leading cause of death and is associated with the onset of many chronic diseases including type 2 diabetes, cardiovascular diseases, and cancers (Safaei et al, 2021) with a substantial economic burden (Tremmel et al, 2017). Statistics published by the UK Parliament taken from the 2021 Health Survey for England (a random cross-section of the adult population in England based on postcodes) shows that overweight and obesity are prevalent in England (25.9% obese, 64.3% overweight or obese) with rates continuing to rise (Baker, 2023). Notably, rates of overweight and obesity in nurses, are equivalent to, or higher than the general population. For example, analysis of nationally representative data from the Health Survey for England found high obesity prevalence among healthcare professionals in England (25.1%, compared to 25.9% of the general population in England: Baker, 2023), particularly among nurses and unregistered care workers (Kyle et al, 2017). Similarly, data from the Scottish Health Survey shows concerning levels of overweight and obesity among Scottish nurses (69.1%, compared to 67% of the general population in Scotland: Baker, 2023), with rates significantly higher for nurses than other healthcare professionals and those from non-health related occupations (Kyle et al, 2016).

Many other survey studies conducted in England have shown that a high proportion of registered and student nurses are overweight or obese, have low levels of physical activity, and eat an unhealthy diet, meaning they do not consume their '5-a-day' (government recommended daily fruit and vegetable intake) and eat foods high in fat and sugar daily (Austin et al, 2022; Blake et al, 2021; Blake et al, 2017; Blake and Patterson, 2015; Malik et al, 2011). Similar patterns have been identified in the United States (Ross et al, 2019). Notably, the high prevalence of overweight, obesity, and unhealthy diets observed in student populations (Austin et al, 2022; Blake et al, 2021; Blake et al, 2017) demonstrates that patterns of unhealthy behaviour, such as unhealthy diet and low levels of exercise, can be established early in the nursing career. This is likely exacerbated by low levels of knowledge relating to obesity risk in student nurses (Gormley et al, 2020). There are potential implications for care quality, since obesity and poor dietary habits in student nurses predicts negative attitudes towards, and low confidence in, health promotion practice (Blake et al, 2021). As registered nurses, poor diet and obesity can influence the willingness or ability to promote healthy eating to patients, and confidence in whether patients will heed healthy eating advice (Blake and Patterson, 2015). Interventions to support healthy eating and weight management are needed for nurses and may benefit from being established early in the nursing career. This may help to encourage a healthy nursing workforce for the future and contribute to engagement in high-quality health promotion practices at all career stages.

Importantly, dietary habits, physical activity, overweight and obesity are largely comparable between nurses and the general population, meaning they are not necessarily role models for the healthy behaviours they promote. There is a long-standing debate around whether nurses *should* be role models for health (Rush, 2005). However, Darch and colleagues (2019) highlight the national and international professional expectations for nurses to be healthy role models outlined by the International Council of Nurses and the UK Department of Health. The Nursing and Midwifery Council's (NMC, 2018) Code of Conduct emphasises the need for nurses to prioritise self-care; and this includes nursing students, and healthy behaviours such as diet and physical activity (Smart and Creighton, 2022). Multiple anonymous survey studies with registered and pre-registered nurses have suggested that their views align with these professional expectations, as participants across a range of studies believed they *should* be role models for health (e.g., Blake et al, 2017; Blake et al, 2015). Conversely, qualitative studies have shown that nurses and student nurses share the same struggles with their health as the rest of society and have diverse views about whether they should be healthy role models or mirror society (Darch et al, 2019). Other studies indicate that some nurses find the introduction of a professional expectation around personal behaviours unacceptable (Wills et al, 2019; Kelly et al, 2017).

Yet, nurses' beliefs about whether they should (or should not) be role models for health may influence the care they provide to their patients, and the way in which patients receive (and heed) their health promotion advice. Research conducted in England has shown that nurses who hold more positive attitudes towards being role models for health are more likely to have positive attitudes towards, and engage in, health promotion practice (Blake et al, 2021). Differences have also been identified between nurses of a healthy or unhealthy weight in their attitudes towards health promotion and their willingness to engage in health promotion practice.

Analysis of data from two survey studies showed that nurses who are overweight or obese are less likely to have positive attitudes towards health promotion practice compared to nurses of a healthy weight (Blake et al, 2021; Blake et al, 2017). There may be myriad reasons for this, although obese nurses have reported feeling less confident engaging in health promotion practice relating to diet or weight management. In a qualitative study by Wills and Kelly (2017), obese nurses reported that being obese made it more challenging for them to discuss weight-loss and healthy lifestyles with their patients (Wills and Kelly, 2017). Nurses who are obese report concerns that patients will not take their health advice seriously. For example, in an online survey conducted by Wills and colleagues (2019),

nurses reported that being obese makes the public less likely to trust their public health messages (Wills et al, 2019). Other survey data shows that nurses with a healthier diet and lower body mass index (BMI) report greater confidence that patients will heed their health promotion advice, compared to nurses who consume a less healthy diet and had a higher BMI (Blake et al, 2021).

### **What are the barriers and enablers of healthy eating at work?**

Before effective interventions can be implemented in the workplace, there is a need to understand the factors that help or hinder engagement in healthy eating. A recent systematic review examined the enablers and barriers related to healthy eating among nurses employed in hospital settings (Marko et al, 2022). The review included 29 studies (8024 nurses) of which 8 were qualitative, 18 were quantitative and 3 had a mixed-methods design.

Marko and colleagues classified the key enablers and barriers as (a) *environmental* (e.g., accessibility and proximity of healthy versus unhealthy foods, perceived high cost of healthy foods, and a lack of storage and preparation facilities); (b) *organisational* (e.g., enablers were roster planning to establish routines around meals and workplace health promotion programmes, barriers were shift work, inconsistent rosters and high work demands); (c) *interpersonal* (e.g., an enabler was supportive networks, barriers were work culture such as social norms of celebrations and gifts of food from patients), and (d) *intrapersonal* (e.g., barriers included stress and fatigue, personal values, beliefs, attitudes, and individual characteristics, with enablers also including attitudes and individual characteristics) (Marko et al, 2022). Factors at the environmental, organisational, inter-, and intrapersonal level may all interact. Consider the challenges of healthy eating for a busy nurse, working nights and long shifts, with low personal motivation for healthy eating, easy access to unhealthy foods, and influenced by powerful social norms to consume unhealthy food items with colleagues.

An important consideration is that, across different countries and settings, nurses identify many more barriers to healthy eating at work than enablers (Nicholls et al, 2017; Uchendu et al, 2020). These barriers can be challenging to overcome. Perhaps even more challenging for novice nurses who are newly adapting to working in the clinical environment and have been found to experience difficulties in engaging in, or maintaining, healthy behaviours at the same time (Han et al, 2019). This demonstrates the need for healthcare employers to make healthy choices an easier option, for their current workforce and future generations.

### **What interventions could help?**

A five year before-and-after evaluation showed that a workplace wellness programme targeting NHS staff, including health campaigns, health promotion activities and access to exercise facilities, increased the proportion of staff reporting positive dietary habits (e.g., 5-a-day), increased physical activity levels, and reduced sickness absence (e.g., Blake et al, 2013). With an overall sickness absence rate (ratio between the number of cases of sick leave and the number of employees) in England of 5.5% in the NHS (and 5.9% for nurses), any reduction in sickness absence associated with workplace health intervention could potentially generate significant cost savings for the NHS. There is less published evidence focusing specifically on healthy eating or weight management interventions for nurses (Torquati et al, 2017; Stanulewicz et al, 2019). A systematic review including 136 studies reporting on lifestyle health promotion interventions for nurses (Stanulewicz et al, 2019) found that only nine of these studies targeted healthy eating. These interventions included education about nutrition or healthy eating (online or face-to-face), skills building (e.g., cooking classes), behavioural strategies (e.g., monitoring dietary habits and exercise, goal setting, creating self-care or action plans), or the provision of physical resources (e.g., water bottle, sandwich box, healthy cookbook).

Several interventions adopted more than one approach, and some interventions focused on both exercise and diet. Most of the interventions led to improved self-reported dietary habits or nutritional intake, although tools used to measure these varied. However, there were only two randomised controlled trials, and the other studies had no comparison group, so the pool of evidence was drawn from studies with methodological limitations. More recently, international studies indicate that providing healthy meals to nurses during their working hours can improve dietary intake (Denmark: Leedo et al, 2017), and that weight loss may be achieved with mobile app-based weight management coaching (Singapore: Lim et al, 2022). However, there remain few high-quality research studies in this area, limited evidence from the UK, and it is still not well established 'what works', 'for whom', and 'in what' nursing job roles and healthcare workplace contexts.

There are useful resources available to help nurses reflect on, and access support for, their own health and wellbeing. For example, in a book entitled "Health and Wellbeing for Nurses and Midwives" (Blake and Stacey, 2023) targeting readership at all stages of the nursing career, Wills (2023) describes the well-established barriers to healthy eating for nurses, such as the social and physical environment, long working hours, and shift work. A systematic review and meta-analysis (including 11 studies from America, Europe and Australia and a total of 74,651 nurses) found that shift work plays a significant role in the development of obesity among nurses (Zhang et al, 2020).

With rising levels of obesity in nurses, addressing the barriers that shift work presents to dietary habits is a significant factor. Wills' (2023) chapter includes a case study from Nottingham University Hospitals NHS Trust in the UK details the implementation of a 12-week in-house weight management programme for employees, delivered as part of a whole trust workplace wellness programme. This is an example of 'good practice' rather than research evidence, but many NHS staff, including nurses, who engaged with this workplace weight management intervention lost over 5% of their body weight. Kyle (2023) advocates the importance of nurses being physically active to manage and prevent rising rates of obesity. Fiona McQueen, a former chief nursing officer for Scotland, provides a personal case study describing how her own efforts to become more physically active were a catalyst to engaging nurses across the nation in a walking initiative called the 'Step Count Challenge', achieved through peer support, shared stories, and camaraderie. A summary of approaches to improving healthy eating and weight management in nurses is shown in Figure 1.

## **Conclusions**

The health and wellbeing of the nursing workforce is vital to the future of health and care services, yet many nurses experience barriers to making healthy lifestyle choices. Education and training may enhance nurses' knowledge and positive attitudes towards health behaviours and help to shape a positive work culture and social norms for healthy eating. Advocating the value of self-care is paramount, as individuals have a responsibility to look after their own health and wellbeing. Senior role models can champion health promotion for nurses at a local and national level. Employers should consider the structural factors that, such as job design (e.g., work hours / patterns), workplace health policy (e.g., hydration at work), the working environment, and other systems and practices that influence nurses' health-related choices.

### Individual level



- Learn more about nutrition, healthy diet, and the impact of night work and shift work on eating habits, overweight and obesity. This will help you to understand more about diet, obesity and health, which will support you in your role as a nurse.
- If you would like to help your organisation to create a health-promoting environment, then (a) get engaged in workplace health initiatives, such as organising a healthy eating or step count challenge; (b) become a workplace health champion and help to promote healthy lifestyle behaviours among peers.
- If you would like to eat more healthily or lose weight yourself, then: (a) recognise your own eating patterns and influencers of your eating decisions, (b) consider how to address any barriers you might have to healthy eating and exercise, (c) check your weight using a healthy weight calculator; (d) write down what motivates you to lose weight; (e) access the Eatwell Guide which can help you get the right balance of the 5 main food groups (f) make an action plan or self-care plan; (g) set achievable weight loss goals and monitor your progress; (h) consider taking part in workplace healthy eating or exercise initiatives; (i) access the free NHS Weight Loss Plan; (j) find some social support; (k) make healthy eating and physical activity something enjoyable; (l) plan ahead - bring your own food to work; (m) celebrate success.

### Organisational level



- Establish a workplace health and wellbeing programme including changes to policies and practices relating to healthy eating and weight management.
- Implement policies that promote health at work (e.g., physical activity and healthy eating, hydration, work breaks).
- Ensure visibility of top-down management and health champion support for health and wellbeing.
- Consider food availability in onsite shops, cafes, canteens, vending machines and that provided by external caterers. Provide and label healthy and low-calorie options.
- Consider making quality improvements related to incentive schemes such as Commissioning for Quality and Innovation (CQUIN) indicators to improve the commissioning and provision of healthy foods.
- Encourage staff to take their work breaks. Provide adequate spaces for staff to take work breaks, prepare and store meals.
- Provide widespread access to water and reduce restrictions on where staff can drink.
- Challenge social norms relating to unhealthy eating. In clinical areas, this might include open conversations about healthy eating among peers to shift the culture, and encouraging grateful relatives to donate to a staff fund to support health and wellbeing instead of gifting unhealthy foods.
- Run healthy eating campaigns. Suggestions include education and training materials, cookery sessions or healthy eating workshops, providing healthy recipes, 'taste and try' or themed food days, physical activity and active travel initiatives.
- Consider how technology could be used to promote healthy eating and exercise, such as mobile phone apps, text messaging interventions, or web-based programmes (i.e., flexible, low cost, low impact on time, wide reach).
- Provide access or signposting to weight loss programmes or specialist advice.

**Figure 1.** Approaches to improving healthy eating and weight management (Photos by Nathan Dumlao and Ello on Unsplash)

## References

- AOMRC. 2019 Healthcare Professionals' Consensus Statement for Action Statement for Health and Work, April 2019. Available at: [https://www.aomrc.org.uk/wp-content/uploads/2019/04/Health-Work\\_Consensus\\_Statement\\_090419.pdf](https://www.aomrc.org.uk/wp-content/uploads/2019/04/Health-Work_Consensus_Statement_090419.pdf)
- Austin. Exploring barriers, motivators and solutions to achieve a healthy lifestyle among undergraduate student nurses. *British Journal of Nursing*, 2022; 31; 4. Available at: <https://www.britishjournalofnursing.com/content/professional/exploring-barriers-motivators-and-solutions-to-achieve-a-healthy-lifestyle-among-undergraduate-student-nurses/>
- Baker, 2023. Obesity statistics. UK Parliament, House of Commons Library. 12 January, 2023. Available at: <https://commonslibrary.parliament.uk/research-briefings/sn03336/#:~:text=The%20Health%20Survey%20for%20England,is%20classified%20as%20'overweight'>.
- Blake, H and Stacey, G. *Health and Wellbeing at Work for Nurses and Midwives*. 1st Edition, November 23, 2022. Elsevier, paperback ISBN: 9780323880534.
- Blake H, Patterson J. Paediatric nurses' attitudes towards the promotion of healthy eating. *Br J Nurs*. 2015 Jan 22-Feb 11;24(2):108-12.
- Blake H, Stanulewicz N, Griffiths K. Healthy Lifestyle Behaviors and Health Promotion Attitudes in Preregistered Nurses: A Questionnaire Study. *J Nurs Educ*. 2017 Feb 1;56(2):94-103
- Blake H, Watkins K, Middleton M, Stanulewicz N. Obesity and Diet Predict Attitudes towards Health Promotion in Pre-Registered Nurses and Midwives. *Int J Environ Res Public Health*. 2021 Dec 20;18(24):13419.
- Blake H, Zhou D, Batt ME. Five-year workplace wellness intervention in the NHS. *Perspect Public Health*. 2013 Sep;133(5):262-71. doi: 10.1177/1757913913489611.
- Darch J, Baillie L, Gillison F. Preparing student nurses to be healthy role models: A qualitative study. *Nurse Educ Pract*. 2019 Oct;40:102630.
- de Vries, H., Kremers, S.P.J., Lippke, S. (2018). Health Education and Health Promotion: Key Concepts and Exemplary Evidence to Support Them. In: Fisher, E., et al. *Principles and Concepts of Behavioral Medicine*. Springer, New York, NY. [https://doi.org/10.1007/978-0-387-93826-4\\_17](https://doi.org/10.1007/978-0-387-93826-4_17)
- Han K, Kim YH, Lee HY, Cho H, Jung YS. Changes in health behaviours and health status of novice nurses during the first 2 years of work. *J Adv Nurs*. 2019 Aug;75(8):1648-1656. doi: 10.1111/jan.13947.
- Horton Dias CE, Dawson RM, Harris DM, Wirth MD, Abshire DA. Foods and Beverages Available to Nurses in Hospital Cafeterias, Vending Machines, and Gift Shops. *Am J Health Promot*. 2022 Sep;36(7):1133-1141. doi: 10.1177/08901171221089620.
- Horton Dias C, Dawson RM. Hospital and Shift Work Influences on Nurses' Dietary Behaviors: A Qualitative Study. *Workplace Health Saf*. 2020 Aug;68(8):374-383. doi: 10.1177/2165079919890351.

- Kelly M, Wills J, Sykes S. Do nurses' personal health behaviours impact on their health promotion practice? A systematic review. *Int J Nurs Stud.* 2017 Nov;76:62-77.
- Kelly M, Wills J, Jester R, Speller V. Should nurses be role models for healthy lifestyles? Results from a modified Delphi study. *J Adv Nurs.* 2017 Mar;73(3):665-678.
- Kyle, R. Being physically active. In: Blake, H and Stacey, G, eds (2024). *Health and Wellbeing at Work for Nurses and Midwives.* Elsevier.
- Kyle RG, Wills J, Mahoney C, Hoyle L, Kelly M, Atherton IM. Obesity prevalence among healthcare professionals in England: a cross-sectional study using the Health Survey for England. *BMJ Open.* 2017 Dec 4;7(12):e018498.
- Kyle RG, Neall RA, Atherton IM. Prevalence of overweight and obesity among nurses in Scotland: A cross-sectional study using the Scottish Health Survey. *Int J Nurs Stud.* 2016 Jan;53:126-33.
- Leedo E, Beck AM, Astrup A, Lassen AD. The effectiveness of healthy meals at work on reaction time, mood and dietary intake: a randomised cross-over study in daytime and shift workers at an university hospital. *Br J Nutr.* 2017 Jul;118(2):121-129. doi: 10.1017/S000711451700191X.
- Lim WX, Fook-Chong S, Lim JW, Gan WH. The Outcomes of App-Based Health Coaching to Improve Dietary Behavior Among Nurses in a Tertiary Hospital: Pilot Intervention Study. *JMIR Nurs.* 2022 Jul 15;5(1):e36811. doi: 10.2196/36811.
- Malik S, Blake H, Batt M. How healthy are our nurses? New and registered nurses compared. *Br J Nurs.* 2011 Apr 28-May 12;20(8):489-96.
- Marko S, Wylie S, Utter J. Enablers and barriers to healthy eating among hospital nurses: A systematic review. *Int J Nurs Stud.* 2023 Feb;138:104412. doi: 10.1016/j.ijnurstu.2022.104412.
- Nicholls R, Perry L, Duffield C, Gallagher R, Pierce H. Barriers and facilitators to healthy eating for nurses in the workplace: an integrative review. *J Adv Nurs.* 2017 May;73(5):1051-1065. doi: 10.1111/jan.13185.
- Nursing and Midwifery Council (2018) *Future nurse: Standards of proficiency for registered nurses.* London: NMC
- Ross A, Yang L, Wehrle L, Perez A, Farmer N, Bevans M. Nurses and health-promoting self-care: Do we practice what we preach? *J Nurs Manag.* 2019 Apr;27(3):599-608. doi: 10.1111/jonm.12718.
- Ross A, Bevans M, Brooks AT, Gibbons S, Wallen GR. Nurses and Health-Promoting Behaviors: Knowledge May Not Translate Into Self-Care. *AORN J.* 2017 Mar;105(3):267-275. doi: 10.1016/j.aorn.2016.12.018.
- Rush KL, Kee CC, Rice M. Nurses as imperfect role models for health promotion. *West J Nurs Res.* 2005 Mar;27(2):166-83; discussion 184-7.
- Safaei M, Sundararajan EA, Driss M, Boulila W, Shapi'i A. A systematic literature review on obesity: Understanding the causes & consequences of obesity and reviewing various machine learning approaches used to predict obesity. *Comput Biol Med.* 2021 Sep;136:104754. doi: 10.1016/j.combiomed.2021.104754.

Sartorius N. The Meanings of Health and its Promotion. *Croat Med J.* 2006 Aug; 47(4): 662–664.

Smart A, Creighton L (2022) Professionalism in nursing 3: the value of self-care for students. *Nursing Times* [online]; 118: 6

Stanulewicz N, Knox E, Narayanasamy M, Shivji N, Khunti K, Blake H. Effectiveness of Lifestyle Health Promotion Interventions for Nurses: A Systematic Review. *Int J Environ Res Public Health.* 2019 Dec 18;17(1):17.

Torquati L, Pavey T, Kolbe-Alexander T, Leveritt M. Promoting Diet and Physical Activity in Nurses. *Am J Health Promot.* 2017 Jan;31(1):19-27. doi: 10.4278/ajhp.141107-LIT-562.

Tremmel M, Gerdtham UG, Nilsson PM, Saha S. Economic Burden of Obesity: A Systematic Literature Review. *Int J Environ Res Public Health.* 2017 Apr 19;14(4):435. doi: 10.3390/ijerph14040435.

Uchendu C, Windle R, Blake H. Perceived Facilitators and Barriers to Nigerian Nurses' Engagement in Health Promoting Behaviors: A Socio-Ecological Model Approach. *Int J Environ Res Public Health.* 2020 Feb 18;17(4):1314. doi: 10.3390/ijerph17041314.

Wills, J. Healthy eating, diet and obesity. In: Blake, H and Stacey, G, eds (2024). *Health and Wellbeing at Work for Nurses and Midwives.* Elsevier.

Wills J, Kelly M. Investigating the attitudes of nurses who are obese. *Nurs Stand.* 2017 Jul 12;31(46):42-48.

Wills J, Kelly M, Frings D. Nurses as role models in health promotion: Piloting the acceptability of a social marketing campaign. *J Adv Nurs.* 2019 Feb;75(2):423-431.

Zhang Q, Chair SY, Lo SHS, Chau JP, Schwade M, Zhao X. Association between shift work and obesity among nurses: A systematic review and meta-analysis. *Int J Nurs Stud.* 2020 Dec;112:103757. doi: 10.1016/j.ijnurstu.2020.103757.