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Developing awareness of sustainability in nursing and midwifery using a scenario-based approach: Evidence from a pre and post educational intervention study☆

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ABSTRACT

Background: The delivery of healthcare has an impact on the environment and contributes to climate change. As a consequence, the way in which nurses and midwives use and dispose of natural resources in clinical practice, and the subsequent impact on the environment, should be integral component of nursing and midwifery education. Opportunities need to be found to embed such issues into nursing curricula; thus bringing sustainability issues 'closer to home' and making them more relevant for clinical practice.
Objectives: The study was designed to measure the impact of a sustainability-focussed, scenario-based learning educational intervention on the attitudes and knowledge of student nurses and midwives.
Design: Pre test/Post test intervention study using scenario-based learning as the educational intervention. The Sustainability Attitudes in Nursing Survey (SANS_2) was used as the outcome measure.
Settings: Clinical skills session in a UK University School of Nursing and Midwifery.
Participants: 676 second year undergraduate nursing and midwifery students.
Methods: The 7-point scale SANS survey was completed before and after the teaching session; standard non-parametric analysis compared pre and post intervention scores.
Results: Changes were observed in attitude towards climate change and sustainability and to the inclusion of these topics within the nursing curricula ($p = 0.000$). Participants demonstrated greater knowledge of natural resource use and the cost of waste disposal following the session ($p = 0.000$). Participants also reported that sessions were realistic, and levels of agreement with statements supporting the value of the session and the interactive nature of delivery were higher following the session.
Conclusions: Using a scenario-based learning approach with nursing and midwifery students can change attitudes and knowledge towards sustainability and climate change. Embedding this approach in the context of clinical skills provides a novel and engaging approach that is both educationally sound and clinically relevant.

1. Background

Health professionals are becoming increasingly concerned about the health impacts of climate change and the impending challenges they will face in delivering healthcare (Bell, 2010; Nichols et al., 2009; Goodman and Richardson, 2010; Richardson and Wade, 2010; Goodman and East, 2014). The potential health impacts of a changing climate are now well documented and will have most impact on the developing world and low-lying nations (Costello et al., 2013). However, recent events such as heatwaves and flooding, demonstrate that developed countries will also be affected (see for example UK Flood Guidance, 2017). Haines et al. (2006) point out that the 'dramatic advances in health' seen in recent decades may be reversed as populations, especially poorer groups, suffer the repeated stresses of flooding. This can lead to exacerbation of conditions such as asthma, and an increase in waterborne infectious diseases. Furthermore, loss of income and insurance cover as a consequence of flooding can also have detrimental impacts on health status.

In the UK, attempts are being made to raise awareness and consider how best to mitigate against the damaging effect of our over use of fossil fuels which are seen as a key determinant in the damage to the environment Department of Energy and Climate Change National Policy Statement for Fossil Fuel Electricity Generating Infrastructure, EN-2, 2011). The UK national awareness raising programme 'Keep it in

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the ground' (The Guardian, 2016) in response to Greenpeace and other non- government organisations' lead, has been informative and helpful in getting the general public to understand the major issues. However moving businesses away from an over reliance on fossil fuels and supporting the development of alternative energy sources has had a mixed response (Ihlen, 2009). Webb (2012) draws attention to the complexities inherent in challenging a consumerist society to consider the amount of resource they use. In reality, however, this may be forced on consumers, given that the Intergovernmental Panel on Climate Change (IPCC Report, 2014) report warns that extreme weather events will push up prices of some goods and make them unaffordable for some consumers. Furthermore, it is not only 'consumer goods' that are of concern, once basic food stuffs are threatened then there is a potential for poor diets to lead to deteriorating health (Food and Agriculture Organization of the United Nations, 2008).

The annual procurement budget of the NHS is £100bn and efforts to reduce this will result in positive effects on the carbon burden (Department of Health, 2013). The provenance of the raw materials used in healthcare, how they are manufactured, packed and transported creates a high carbon load at every stage (Grose and Richardson, 2013a). How we use the resources requires awareness of their cost and knowledge of the evidence surrounding infection prevention and when items can safely be re-used (Nichols et al., 2016). Of significant concern is how the overuse of physical resources negatively affects carbon reduction targets set out by the UK NHS. In 2015 the NHS carbon footprint in England was 22.8 million tonnes of carbon dioxide equivalents ($MtCO_2e$) (NHS Sustainable Development Unit, 2016). Inevitably as more materials are used, more waste is generated by healthcare activity. However, the NHS carbon strategy is moving in the right direction. For example between 2007 and 2015 the carbon footprint of the NHS in England reduced by 11% largely due to the efforts made by hospital Estates Departments to reduce energy use and move towards more sustainable methods of creating energy (NHS Sustainable Development Unit, 2016). Inevitably as the carbon footprint of the NHS has reduced, the burden of the waste produced by delivering healthcare remains a significant challenge (Nichols et al., 2016).

Researchers are building an evidence- base on which to develop strategies to meet the challenges associated with a changing climate and potential threats to the scarce natural resources required in the delivery of healthcare (Richardson et al., 2008, 2009; Nichols and Richardson, 2011; Grose and Richardson, 2012; Anaker and Elf, 2014). Bell et al. (2012) have considered how it might be possible to create an 'adaptive' health service workforce who are cognisant of the evidence, and have clinical care strategies that enable resilience in the face of extreme weather events or decreased resources availability. Education will be essential to building a resilient and adaptive nursing and midwifery workforce (Goodman and East, 2014). This will require awareness of the health impacts of climate change, as well as an understanding of the environmental impacts of healthcare delivery.

There are opportunities to embed issues regarding climate change and health into nursing curricula in the context of global and public health by making connections with the changing climate and natural resources (Goodman and Richardson, 2010; Richardson and Wade, 2010; Richardson et al., 2014, 2015, 2016). This brings the issues 'closer to home' by making them more relevant for clinical practice (Grose and Richardson, 2015).

Using existing evidence (Goodman and Richardson, 2010; Grose and Richardson, 2013a,b; Richardson et al., 2014, 2015), this paper reports on the evaluation of an interactive and transferrable educational approach to embedding sustainability in healthcare teaching.

The research question posed in this research is: can an educational intervention designed to raise awareness about sustainability impact on attitudes and knowledge of student nurses and midwives?

2. Methods

2.1. Intervention

Within nursing, midwifery and healthcare education more generally, the aim is to focus on students' ability to assimilate knowledge and build practical skills that they can then transfer to clinical practice. Rehearsal and learning within simulated clinical skills environment is one strategy for achieving this as it utilises principles of active learning (Coiffi, 2001). The intervention used here is a health and sustainability scenario session that has been delivered to over 600 student nurses, midwives and other healthcare professionals such as dentists and general practitioners. The session is evidence-based and designed to represent a hypothetical but clinically relevant scenario that engages students in discussion about the impact of healthcare on the environment, and issues regarding sustainability and climate change (Richardson et al., 2014). The scenario is based on research undertaken in the UK National Health Service (NHS) that examined the potential for interruptions in the supply chain of items important for clinical care that are manufactured from natural resources (Grose and Richardson, 2012). Using principles from education for sustainable development (ESD) it was designed to be interactive and clinically relevant, using principles from social learning theory (Sterling, 2007).

Participants were facilitated in small groups during clinical skills sessions. The session ran for approximately 50 min and considered a scenario where the global price of plastic is increasing. Using the Internet, students are encouraged to discuss where plastic comes from and factors that might lead to a price rise. Items used in everyday clinical practice that are made from plastic were handed to students and they were asked to consider the impact on patient care if the natural resource (oil) were no longer available to make items such as intravenous giving sets and infusion bags, medicine pots, syringes and blister packs. An 'impact line' (made from a tape measure) was provided and students were invited to place the item on the line, ranging from 'no impact on patient care' to 'high impact on patient care'. The purpose of this was to encourage students to discuss how these items are used (and over-used) and to think about what alternative items or materials might be substituted. The students are then given an example of how the item could have been used in clinical practice, and whether it was potentially contaminated. Based on the example, they were asked to allocate the item to 'clinical waste', 'domestic waste', or 'other' (for example re-use or recycle), providing an explanation for their choice. Finally they were asked to estimate the cost of disposing of a 5 kg bag of domestic waste and a 5 kg bag of clinical waste; costs (based on the average calculation for England) are revealed at the end of the session. For details of how the session works see http://youtu.be/zIFT2Dbg08o.

2.2. Participants

Participants were nursing (adult and child health programmes) and midwifery students in their second year of studying at a University in South West England. Data was collected over a two year period which included the 2103 and 2014 cohorts.

Full ethical approval was provided by the Faculty Research and Ethics Committee.

2.3. Measures

The 'Sustainability Attitudes in Nursing Survey' (SANS_2) questionnaire used in this study was developed and piloted at Plymouth University (UK) with second year student nurses (Richardson et al., 2014) Questions were designed to elicit agreement or disagreement with statements regarding climate change and sustainability, and the inclusion of these topics in the nursing and midwifery curriculum. Development of the questionnaire was based on discussions with