

*International Journal of*  
**Older People Nursing**

## Virtual simulation training: imaged experience of dementia

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| Journal:         | <i>International Journal of Older People Nursing</i>   |
| Manuscript ID    | OPN-2018-1179.R2                                       |
| Manuscript Type: | Original Article                                       |
| Keywords:        | Dementia, Person-Centred Practice, Qualitative Methods |
|                  |  |

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## ABSTRACT AND KEYWORDS

**Background and Objectives:** The need to provide an empathic response to the care of people with dementia has long been advocated. Virtual reality-based programmes continue to gain momentum across health sectors, becoming an innovative tool that provides staff with the opportunity to experience a dementia like experience within a relatively short time frame. The purpose of this study is to explore the impact of an interactive training experience on moral, emotive, behavioural and cognitive elements of empathy.

**Research Design and Methods:** A qualitative exploratory design was adopted employing purposive sampling to identify participants, aged over 18 years, who participated in the Virtual Dementia Tour (VDT®) programme. Interviews were conducted over a two-month period, and qualitative thematic analysis was used to analyse the data.

**Results:** The four components (moral, emotive, behavioural and cognitive) of empathy were reflected in findings. Overall the interactive training programme was perceived as useful and emotionally, it provided an opportunity to 'imagine what it is to live with dementia', enabling a cognitive, moral and behavioural reflection to occur, enhancing the empathic state.

**Discussion and Implications:** In this study, the VDT® provides a different way of learning, with participants reporting the emergence of an empathic response. Results suggest that the emotional response laid the foundations to the behavioural or cognitive (objective and subjective) reaction which was underpinned by a moral reaction. Virtual reality programmes are one step in the process for healthcare professionals caring empathetically for people with dementia however further research is required.

**Word count: 248 (250 max)**

**Key words:** Virtual Dementia Tour, hospital, empathy, healthcare professionals, caregivers

## **SUMMARY STATEMENT OF IMPLICATIONS FOR PRACTICE:**

### **What does this research add to existing knowledge in gerontology?**

- This study builds upon the evidence base for the use of virtual reality simulation programmes specifically the Virtual Dementia Tour (VDT®), to help educate health care professionals and carers about the imaged reality of a person with dementia.
- Numerous studies report virtual reality enhances empathy generically but this study views empathy as a multi-dimensional phenomenon, with emotional, moral, cognitive and behavioural (communicate) components.

### **What are the implications of this new knowledge for nursing care with older people?**

- The integration of the Virtual Dementia Tour (VDT®), provides a different learning opportunity of the imaged reality of having dementia.
- Experiencing the imagined reality of having dementia and emotional consequence of that experience helps to create an emphatic response. Allowing health care professionals and carers access to such experiences enabled a greater sense of understanding, awareness and reflective caring behaviour towards a person with the condition.

### **How could the findings be used to influence policy or practice or research or education?**

- Whilst virtual reality only represents the imaged world of a person with dementia, it offers potential educational opportunities upon which to build an emphatic understanding and potentially the care being delivered.

## INTRODUCTION

Dementia is considered a global health priority with projections of the disease set to increase dramatically across the world (World Health Organisation 2012; 2015). International and national policy and research have highlighted the need to equip healthcare professionals and family caregivers not only with skills and knowledge but also an empathic understanding of people living with a condition (WHO, 2008; Department of Health, 2010; Jütten et al., 2017). Research suggests people who are empathetic tend to provide better care and can enhance patient satisfaction and outcomes (Kim et al 2004; Dal Santo et al., 2013; Ahrweiler et al., 2014). Whilst empathy has been defined and conceptualised in different ways (Jeffery, 2016), the central tenet of most definitions refers to the ability to understand another person's experiences and feelings (Cunico et al., 2012; Lemogne, 2015). However, research suggests that empathy is not a singular entity rather it is composed of different dimensions (Bylund & Makoul, 2002). Informed by an original review of the nursing literature, and further reinforced in a second review by Reynolds and Scott (1999), Morse et al. (1992) believed empathy was comprised of four key components: moral, emotive, behavioural and cognitive (see table 1).

<<Please insert table 1 here>>

Whilst this model is dated, it brings together the four clinically relevant components that have been empirically demonstrated (Decety & Jackson, 2004; Eisenberg & Eggum, 2009). Other scholars believed empathy involved two components, cognitive and affective (Wiseman, 2007; Hojat et al., 2009). Whilst it is unclear the extent to which the components are interrelated (Cutcliffe & McKenna, 2005), the multi component model of empathy identifies two distinct areas: empathetic understanding and empathetic action to emphasise the importance of the

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3 cognitive/emotive aspects on the one hand and the behavioural/action component on the other  
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5 hand (Mercer & Reynolds, 2002).  
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10 With regards to the person with dementia this requires gaining an insight into a “*fragmented*  
11 *and confused world which may be changing, unpredictable and sometimes frightening*”  
12 (Cunningham, 2006 cited in Digby & Lee, 2006, p53). Compelling evidence exists which  
13 suggests that empathy can improve outcomes for patients, caregivers and healthcare  
14 professionals (Fujimori et al., 2014; Little et al., 2015; Everson et al., 2015; Wijma et al., 2018).  
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24 However, deficits in empathy in current clinical training and practice exist (Chen et al., 2007;  
25 Jeffery, 2016). For example, in the United Kingdom (UK), a number of public inquiries  
26 (Francis Report, 2013; Parliamentary and Health Service Ombudsman, 2015) suggest severe  
27 failings in patient care was attributed to a lack of staff empathy. Criticism has also been  
28 levelled at caregiver training initiatives which lack practicality and transference to daily life  
29 (Chen et al., 2012; Jütten et al., 2017)., with some caregivers finding it difficult to understand  
30 and cope with the changing functioning and behaviour of their family member with dementia  
31 (Veerbeck et al., 2016). Increasingly healthcare providers and caregivers are using virtual  
32 reality (VR) simulation as one approach to enhance empathic understanding for training and  
33 educational purposes (Aziz, 2018; Dyer et al., 2018; Jütten et al., 2017; Elliman et al., 2016;  
34 McDougall, 2015), for a range of conditions. For example alcoholism (Metcalf et al., 2018),  
35 multiple sclerosis (Masseti et al., 2016), cardiovascular disease (Silva et al., 2018) and  
36 dementia (Wijma et al., 2018).  
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56 Simulation is a technique to replicate substantial aspects of real world experiences in a fully  
57 interactive fashion, often immersive in nature (Gaba, 2004). The use of virtual reality  
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3 simulations in training has grown due to their advantages over traditional educational methods,  
4 enabling trainees to practice procedures in a safe environment and providing a realistic and  
5 memorable experience in a cost-effective manner (Triola et al., 2006). In response, specific  
6 virtual reality programmes for dementia have emerged, using immersive technology that  
7 utilises a perceptual and/or body ownership illusion which claim to create empathic responses,  
8 by putting the individual at the centre of the imagined experience. While not exhaustive, three  
9 common examples are, the Virtual Dementia Experience™ (VDE™), (Alzheimer's Australia  
10 Vic, 2014), the myShoes project (Adefila et al., 2016) and the Virtual Dementia Tour (VDT®)  
11 (Beville, 2002; 2014) (see table 2).

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31 Each focus on the use of virtual reality to increase dementia awareness through being exposed  
32 to the experience of the imagined world of a person with the condition. Whilst claims suggest  
33 that the programmes enhance empathy, there is a dearth of simulation fidelity and evaluative  
34 evidence of the effectiveness of virtual reality training and its impact on participants' sense of  
35 empathy. The Irish National Dementia Strategy (Department of Health, 2014) outlined a  
36 commitment from the government (Department of the Taoiseach, 2016) to provide appropriate  
37 training for all those caring for people with Dementia. In 2016, the Health Service Executive  
38 (HSE), North West piloted the VDT programme in North –West Ireland to health and social  
39 care staff and family caregivers. This explorative study aims to investigate the impact of the  
40 immersive Virtual Dementia Tour (VDT®) on empathy of health and social care staff and  
41 caregivers.

## 58 **Background**

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3 VR has been described as the ‘ultimate empathy machine’ (Milk, 2015), however few studies  
4 exploring empathy using VR in dementia, identify which components it is measuring. For  
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8 example, an evaluation of the Australian VDE™ programme Doube and McGuire (2016),  
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10 adopting a pre and post-test control quasi-experimental design, reported that it resulted in  
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12 statistically significant increases in empathetic understanding and knowledge of dementia  
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14 when compared to classroom training. In an exploratory mixed empirical evaluation of the  
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16 myShoes programme, Adefila and colleagues (2016) reported that student and social care  
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18 professionals (n=55) reported increased awareness, empathy and compassion, confidence and  
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20 competence as measured on a standardised scale. Empathy scores increased by 7.3%  
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22 immediately after simulation; confidence changed from 4.35 to 5.75, competence from 4.36 to  
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24 5.84; and compassion from 8.48 to 9.10. All changes were positive. Qualitative findings from  
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26 Adefila et al (2016) study, suggested that it can have a positive impact on clinical practice,  
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28 helping participants think beyond ‘treatment’ to considering how the person might feel and  
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30 altering their approach accordingly. For example, one participant reported that the virtual  
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32 experience enabled them to zone out and understand better the service user’s world which had  
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34 consequences in how they interacted and responded to their needs.  
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42 One of the earliest VR simulation programmes for Dementia, the VDT® programme claims to  
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44 be a replication of stage four-five (moderate) dementia, a stage where the person with Dementia  
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46 may require a greater level of care (Reisberg et al., 1982). The VDT® programme places the  
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48 participant in the realm of dementia and provides participants with an imagined ‘insider’s view’  
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50 of the condition to help better understand what it is like living with the condition (Beville,  
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52 2014). In a study of the early version of the VDT® programme, Beville (2002) used a repeated  
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54 measures research design with a sample of 146 participants and reported significant increases  
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56 in participants’ understanding of the emotional needs of people with dementia, recognition of  
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3 the importance of sensitisation to symptoms and understanding of why people with dementia  
4 may exhibit inappropriate behaviour. In addition, Beville (2002) also reported a decrease in  
5 perceptions that people with dementia get the care they require.  
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12 Whilst VR is claimed to enhance empathy, it is unclear what components it affects. This  
13 research, stems from research undertaken by Slater et al., (2017), that explored the impact of  
14 the Virtual Dementia Tour (VDT®) on empathy, using a four-component model (Morse et al.,  
15 1992), among health and social care staff and carers.  
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## 21 22 23 24 **DESIGN AND METHODS**

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26 Given the dearth of research exploring the impact of virtual training on the four components of  
27 empathy, a qualitative exploratory design was adopted.  
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### 31 32 33 **Ethical approval**

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35 Prior to the study, ethical approval was obtained from the Regional Ethics Committees.  
36 Interviews were undertaken on a voluntary basis and verbal/written consent was recorded  
37 before interviews commenced. A distress and disclosure protocol were adhered to. All data  
38 collected were anonymised and data were held in accordance with the General Data Protection  
39 Regulation (2018). At the end of the interviews all participants were signposted to sources of  
40 support.  
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### 50 51 **Sampling Frame**

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53 Fifty-two people (both healthcare staff and family carers who had participated in the VDT®  
54 programme were recruited from a Health Service Executive region in Ireland. They were  
55 categorised into six broad disciplines see table 3. From the registration list, a purposive sample  
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3 of participants (n=52) were identified and screened by the health service provider, according  
4 to the following criteria: attended the VDT® experience; were a health and social care  
5 employee representing hospital, community or voluntary services, or family carers, and aged  
6 over eighteen years. All participants were posted an information pack, inviting them to take  
7 part in the study by the Health Service Executive. From this sampling frame, eighteen people  
8 who were reflective of the disciplines involved in the training programme took part (see table  
9 3). All interviews took place within four to six weeks of participating in the VDT®  
10 programme.  
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### 28 **Data collection**

29 An interview schedule, based on the aims of the study and the four-component model (Morse  
30 et al., 1992), guided by three broad aspects: (1) experiences of the VDT® programme (2) the  
31 benefits and (3) impact of the programme on practice. Probes were used to clarify the meaning  
32 of responses. A mixture of one to one face to face (undertaken in the home and Health Service  
33 Executive premises) and telephone interviews were conducted that lasted between 15-35  
34 minutes and with permission, were digitally-recorded and supplemented by field notes. All  
35 interviews were undertaken by two researchers (PF & FH), independently from the Health  
36 Service Executive. Data was collected until saturation occurred. All participants were asked  
37 to complete a demographic questionnaire (ie age, gender, training and work experience) at the  
38 end of the interviews.  
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### 56 **Data analysis**

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3 The interview recordings were professionally transcribed. Morse et al's., (1992) four  
4 components of empathy, were used as a framework to analyse participants empathic response  
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6 of after taking part in the VDT® programme.  
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12 The data were analysed using Mayring's (2000) approach, which is a four-stage thematic  
13 framework. A thematic framework was used in the initial analysis and additional codes were  
14 added to ensure the coding framework was comprehensive. After completion of codes, the  
15 themes and sub-themes were critically reviewed across all interviews and a coherent set of  
16 themes and sub-themes were adopted thus enabling comparisons. Pseudonyms were used  
17 throughout to maintain anonymity.  
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### 28 **Rigour**

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30 The Consolidated Criteria for Reporting Qualitative Research (COREQ) was used to ensure  
31 quality of the research process (Tong et al., 2007) and measures to ensure trustworthiness of  
32 the data were implemented (Lincoln & Guba, 1985). For example, confirmability and  
33 dependability were enhanced by two independent researchers (FH and PG) analysing and  
34 reviewing the transcripts. Credibility was assured by the triangulation of data sources  
35 (healthcare employees and caregivers) and participants' descriptions of their own experiences.  
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37 Transferability was assured by dense description of the research analysis and findings and the  
38 inclusion of quotations in the findings.  
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### 53 **RESULTS**

54 From the fifty-two participants invited, eighteen agreed to take part, representing a response  
55 rate of 35%. Most participants (see table 4) were over thirty-five years of age, were 'front line  
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3 staff' (such as registered nurses and healthcare assistants) 'senior management' with a nursing  
4 background, with other participants including unpaid family carers (n=4), Allied Health  
5 Professionals (AHPs) (n=1), and medical/psychiatric staff (n=1).  
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17 Experience in working with dementia patients ranged from two years to thirty-five years;  
18 average length of time was sixteen years. Almost half of health care professionals (46%)  
19 suggested they spent a little time or less with patients, whilst 31% reported they spent a  
20 moderate amount of time with patients in their role. The findings of this study (Slater et al,  
21 2017) and are presented in accordance with Morse et al., (1992) four components of empathy.  
22 In addition for contextual reasons, a theme related to prior education experience has also been  
23 reported.  
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### 35 **Prior Education Experience**

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37 Almost two thirds (61.1%) of respondents had attended dementia education/training (other than  
38 the VDT®) in the previous two years. Some training had a specific focus on dementia while  
39 other education stemmed from a small element within their overall professional curricula which  
40 had a theoretical-medical focus on the physical and biologic aspects of the disease. Many  
41 reflected that the professional preparation courses was inadequate in the preparation to care for  
42 someone with dementia. As illustrated:  
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51 *"...almost 100% of nursing staff that I work with have got a very limited understanding*  
52 *of dementia. – there's no comprehensive understanding, yet, they have a continuous*  
53 *attendance of clients with dementia, yearlong"* (Participant No 1, Registered Nurse)  
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3                    *“I think there’s a lot of people have never had any formal training”* (Participant No 8,  
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5                    Healthcare Manager)  
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### 10                    **Emotive Component**

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12                    This theme reported participants’ emotive response, which resulted in an emotional reaction  
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14                    when entering and participating in the VDT® programme.    Prior to the VDT® experience,  
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16                    apprehension, uneasiness or fear was expressed by some, attributed to the unfamiliarity and  
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18                    fear of the unknown with the simulator experience. This led them to question their ability to  
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20                    manage their emotions.  
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26                    Entering the VDT® experience, all participants commented on the impact of the devices and  
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28                    environment creating sensory distortion. This resulted in their physical and mental inability to  
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30                    complete what they considered to be common day activities, leading to feelings of frustration.  
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33                    As one participant stated:

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35                    *“You were supposed to match socks, but I couldn’t find - very frustrating, I was*  
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37                    *determined I had to find them, but I couldn’t find them. So, you just give up then. You*  
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39                    *just leave that and go to something else”* (Participant No 3, Healthcare Educator)  
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45                    At the end of the programme, participants were able to observe others in the simulation  
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47                    environment, which allowed for reflection on learning, behaviour and practice to occur. As  
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49                    illustrated:

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51                    *“...it was like seeing me become a dementia person, almost immediately. I could see*  
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53                    *the same characteristics of the patients that we would have, develop immediately.... It*  
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55                    *gives you an understanding of you know, when somebody doesn’t want to come with*  
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3           *you, when somebody doesn't want to get dressed*" (Participant No 7, Healthcare  
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5           Manager)  
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10           Some participants reflected upon the inappropriate and even bizarre behaviour they adopted in  
11           direct response to sensory distortion attributed to feelings of fear and an overriding desire to  
12           keep safe. This resulted in some deliberately moving slowly, staying completely still or staying  
13           close to others to shadow or mimic. Others reported attempting to avoid human contact instead  
14           seeking physical surfaces to cling and attempting to physically withdraw from the environment  
15           leading them to wander. As one participant illustrated:  
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23           *"I couldn't physically move. My whole thing was, stay still. Stay safe. Don't move. Just*  
24           *it doesn't matter what anybody says to you, just hold your ground. "I was afraid to*  
25           *move, and somebody brushed up against me and I could feel myself jumping away from*  
26           *them. So, I just stood there, literally, with my hands across, up against my chest and in*  
27           *fists, just ready to defend myself in a way, but just not moving*" (Participant No 7  
28           Healthcare Manager)  
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40           Participating in the VDT® experience was reported to have an emotional and mental impact.  
41           For example, the misinterpretation of the sensory environmental cues, led some to respond by  
42           laughing, use inappropriate language and question their mental reasoning abilities, second  
43           guessing what they saw, heard and felt. Feelings of anxiety, fear and acute feelings of  
44           vulnerability, disorientation, isolation and powerlessness were widely reported. As the training  
45           progressed, anxiety shifted towards feelings of frustration, stress and annoyance which was  
46           attributed to not being able to master simple tasks and/or lack of ability to rely on their everyday  
47           senses. In contrast, the ability to complete a small task created a sense of satisfaction and an  
48           achievement for some. As one participant reflected:  
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3        *“You feel completely useless ...How am I meant to look for something if I can't find*  
4        *anything? So, I started patting about and he asked me to find, I think it was blue*  
5        *sunglasses or something and I felt and felt and felt, and I realised I'd got glasses and*  
6        *the sense of achievement that I felt! Yes, I found them, but they were the wrong*  
7        *colour!”* (Participant No 17 Family Carer)  
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17        Despite the physical and psychological upset felt, all participants considered the experience to  
18        be a powerful and effective learning tool. Unlike traditional dementia training programmes  
19        which are theory-driven, this experience enabled promotion of a patient's perspective.  
20        Allowing participants to perceive what it was like to *“walk in the shoes of a person with*  
21        *dementia”* which gave it a powerful effective message:  
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31        *“But misidentification, you know, misconstruing, misunderstanding, misrepresenting,*  
32        *misperceptions – all the ‘mis’ and whilst I knew this, and I've been preaching it within*  
33        *my role, I had never really experienced it”* (Participant No 1 Registered Nurse).  
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40        *“Of all the training I've ever done, having been in that ....it is as close as possible to*  
41        *living in a world with dementia. It was the most powerful thing that I've ever*  
42        *experienced. It really gave you a completely different insight”* (Participant No 8,  
43        Healthcare Manager).  
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51        *“.....because I kept thinking, this is what my daddy is going to end up like. I found*  
52        *myself fighting back tears. You often are feeling you're looking after a stranger. I think*  
53        *it's important that the health care professions see what is there, what it must be like for*  
54        *those people”* (Participant No 17, Family Carer).  
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6 This focus on the person, led all participants to perceive the VDT® experience as an effective  
7 educational experience and specifically being superior to traditional educational sessions.  
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10 However, some psychological distress was also reported, linked to a concern about developing  
11 dementia and the effects upon a person's emotional, physical and mental health. An anxiety  
12 related response to the fear of developing dementia created an emotional fear among some  
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17 participants. As reflected by one participant:

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19 *“I would be extremely fearful of ever being diagnosed with dementia. I suppose one of*  
20 *the things that I came away with it, from thinking how can we make people live longer,*  
21 *better and my initial thing was, if I felt like that all the time, would I really want to live*  
22 *longer? (Participant No7, Healthcare Manager).*

### 30 31 **Moral Component**

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33 The opportunity to reflect on the VDT® experience and their practice also highlighted and  
34 confirmed their moral responsibilities, both retrospectively and prospectively. Some  
35 participants realised that they needed to revise their practice to ensure they adopted a person-  
36 centred approach to ensure they focus on the person not the condition.  
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45 *“....to be able to look at it maybe not from a nursing perspective... but to look at it from*  
46 *the patient's point of view and be able to think –this is really frightening. That's not*  
47 *agitation, that's responsive behaviour. It can really frame the way people view a*  
48 *person, a client and ultimately that frames the care they get and approaches to care*  
49 *that are taken” (Participant No 1, Registered Nurse).*

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3           *“And you think, how many older people have I nursed, I never understood how that*  
4           *impacted on their lives. You think poor circulation, you’d be thinking, oh their feet are*  
5           *cold, or give them a nice blanket at night. You didn’t think they’re in [physical] pain.*  
6           *It didn’t occur to me at any time during my 40-year career, that there was actually pain*  
7           *associated. Nobody ever told me”* (Participant No 7 Healthcare Manager).  
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17 However the experience also led to some carers and health care staff to reflect on the care they  
18 had delivered in the past and feel shame and guilt for the way they previously cared for a person  
19 with dementia. This led to some participants recommending that psychological support be  
20 provided to trainees. As one carer explained:  
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26           *“... this particular one person that I spoke to, said “If I’d have known that, we wouldn’t*  
27           *have maybe done certain things.” But she just said, she found it upsetting because she*  
28           *had – her mother had had dementia. ... we don’t want to upset or traumatise people, as*  
29           *part of the training, but think we need to be careful, or certainly aware, that people can*  
30           *come out of it and find it upsetting as well”* (Participant No 8, Healthcare Manager).  
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## 42 **Cognitive Component**

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44 The third theme reported on the cognitive response, which was illustrated by the perceived and  
45 actual impact on knowledge, skills, care and practice.  
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51 Prior to entering the VDT® programme, many associated dementia as predominately affecting  
52 a person’s memory, the programme helped participants became aware of the other  
53 manifestations of dementia not just memory impairment. The effect on the senses helped  
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3 participants to realise why some people with dementia have issues relating to understanding,  
4  
5 judgement, thinking and language. As one participant explained:  
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7  
8 *“I had capacity going into that room. Yes, they took away my feeling, they gave me*  
9  
10 *things that hurt my feet, they put, limited my vision and my hearing, but I didn't actually*  
11  
12 *lose capacity, but I lost the capacity to think, because of – and that's something that it*  
13  
14 *taught me, maybe these people that we think don't have any capacity, to make a*  
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16 *decision, are just so overwhelmed by all the noise and the stuff that we're creating*  
17  
18 *around them. I didn't lose capacity going into there, but I acted like somebody who had*  
19  
20 *no capacity”* (Participant No 7 Healthcare Manager)  
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26 Participants also reported it helped them to grasp why some people with dementia adopt  
27  
28 behavioural and psychological responses such as wandering, feeling aggression and agitation.  
29  
30 This experience enabled many health care participants to reflect on their own practice. As  
31  
32 stated:  
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34  
35 *“.... it made me reflect on lots of interactions that I'd had. I'd think – oh my goodness*  
36  
37 *– maybe that was what was going on and this is a better way of doing things. At one*  
38  
39 *point somebody tried to feed me during the thing and you're like “what the hell are you*  
40  
41 *doing?” “What the hell is that? Where is it coming from? And it was just instantly*  
42  
43 *like – hang on, I've seen people react like this. So yes, it has made me change the way*  
44  
45 *I think about it and the way I act for people with dementia”* (Participant No 4,  
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47 Healthcare Educator)  
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## 56 **Behavioural Component**

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3 Findings also indicated behavioural responses among participants with reports of feeling more  
4 confident to care, being more empathetic and viewing patients care holistically, and leading to  
5 a self-reported change in behaviour. Since the programme several examples of health care staff  
6 and carer participants changing their communicative approach to suit the perceived needs of a  
7 person with dementia were cited. For example, providing more time, maintaining eye contact,  
8 listening and providing reassurance were cited. As illustrated:  
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19 *“It has slowed me down. Whereas before, James\* doesn’t like being rushed and I would*  
20 *pull on his coat and pull on his hat and hand him a cup. Now I get why it’s slow, so it*  
21 *has helped me in that way. Well naturally if I calm down and don’t rush him, it’s going*  
22 *to help him”* (Participant No 6, Family Carer).  
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30 *“So, I certainly would look at people differently. I’m more aware of my voice when I*  
31 *speak and getting eye contact and you know – and telling her what I’m doing, as*  
32 *opposed to “would you like to go” and taking her hand. Explaining things to people,*  
33 *because you could hear that voice”* (Participant No 7, Healthcare Manager)  
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42 All participants reported they were more aware and had a greater appreciation of the effect of  
43 the environment upon the person with dementia. Many recognised how simple changes in the  
44 environment, both within the hospital and in the home could help enhance the person-centred  
45 approach, for example, use of colours to differentiate objects. Participants also referred to  
46 recognising and attending to the ‘little things’ that matter, for example, changes in signage,  
47 improvements in food provision and the use of colours would help improve the care experience.  
48 Consequently, some changes to the environment had already been undertaken, as one  
49 participant explained:  
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3                   *“If you introduce coloured cutlery and crockery, that they should improve their eating.*  
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5                   *So, we’ve actually done that in one of the wards since, just to see if it has any impact.*  
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8                   (Participant No 8, Healthcare Manager).  
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12 Overall, participants voiced their enthusiasm for their engagement with the experience and  
13 believed it enhanced the quality of care delivered. For staff, it was thought to have increased  
14 awareness and understanding of dementia, enhanced communication and confidence, and lead  
15 to staff becoming less judgmental in their management of challenging behaviour among  
16 patients with dementia.. For carers, it was believed it would increase understanding and  
17 ultimately reduce fear, stress and frustration, helping to inform future care options.  
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28 Ultimately all participants believed the knowledge would challenge current care provision,  
29 enhancing the client care experience for the person with dementia and their family. An array  
30 of potential clinical care benefits was cited, including, a reduction in falls, chest infections,  
31 psychiatric referrals and a reliance on medication.  
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## 40 **DISCUSSION AND IMPLICATIONS**

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42 The VDT® programme seemed to increase individuals’ understanding of the imagined  
43 experience of dementia and facilitated an emotive, moral and cognitive impression of empathy  
44 according to the Morse et al. (1992) framework. This was reported to have led to changes in  
45 behaviour. Such findings have been reported in previous research (Beville, 2002; 2014) and  
46 reflect other dementia specific virtual reality programmes (Adefila et al., 2016; Doube &  
47 McGuire, 2016). The distortion of senses and cognitive functions created by the VDT®  
48 experience among participants in this study, elicited emotional responses of fear, frustration  
49 and helplessness and when the participants had an opportunity to watch others in the simulator,  
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3 this enabled reflective learning to occur which formed a richer understanding of the person  
4 with dementia. The importance of reflection to improve self-awareness and promote empathic  
5 understanding is key in this process as it allows participants to become aware of their own  
6 responses, beliefs and biases.  
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14 It is this '*empathetic understanding*' that was reported to have the most potential to impact on  
15 behaviour and communicative practice. Digby and Lee (2016) considered empathy as an  
16 essential component in compassionate care and it features as a core element in person-centred  
17 care (McCormack & McCance, 2017). The findings from this study support this perspective,  
18 as participants were able to reflect and identify previous work practices where they perceived  
19 they were not person-centred, identify how the care environment could be changed to be more  
20 dementia-friendly, and felt they were more confident in working with people with dementia.  
21 Upon reflection, participants also felt that prior education did not prepare them to care for some  
22 with dementia or the array of symptoms associated with this condition.  
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38 The components of empathy (Morse et al., 1992) were reflected in the response of participants  
39 of the VDT® programme. Emotionally the virtual reality programme provided an opportunity  
40 to identify a source of the 'Living with dementia' experience. Participants reported the  
41 subjective sharing of feelings with a person with dementia and provided evidence of the  
42 complexity and cycle of this response driven by identification. For example, feeling the same  
43 emotions as a person with dementia (i.e. fear, confusion), creating feelings of distress in  
44 response, leading to feelings of compassion.  
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56 The cognitive component of empathy was reported by participants adopting what they deemed  
57 was a person with dementia's perspective (or role) to understand the person's thoughts, or  
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3 mental state, when sensory deprived. However, Morse et al. (1992) believed that cognitive  
4 empathy was viewed from an objective stance in order to be able to look at dementia from the  
5 other person's perspective, yet this undermines the intertwining of the subjective response that  
6 the participant may also experience. In this study participants' own world view of dementia,  
7 which was underpinned by their prior caring experience and training, lead to a circular response  
8 of empathy. At a cognitive level, this led many to reflect upon the care they delivered to a  
9 person with dementia, recognising missed opportunities and lack of understanding of dementia.  
10 This cognitive response informed a moral and empathic reflection, leading to feelings of  
11 distress that they were involved in what they considered sub-optimal care. The cognitive,  
12 moral and empathic process translated into behavioural (including communicative) outcomes  
13 for participants where they identified changes in practice they adopted in response. Examples  
14 recognising the power of touch to connect to people with dementia, the volume and tone of  
15 language, together with the maintenance of eye contact were all cited as examples.  
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35 Whilst the four components of empathy (Morse et al., 1992) provide a framework upon which  
36 to understand the differences in empathy, how they are interrelated, requires clarification  
37 (Cutcliffe & McKenna, 2005). In addition, empathy is a moving condition which may be  
38 influenced by different cognitive, social, educational and contextual determinants. Moreover,  
39 virtual simulation training portrays only an imagined experience of what it is like to live with  
40 dementia for a short time period. Questions regarding how empathy from virtual reality  
41 simulations can be nurtured and sustained to ensure care to people with dementia is enhanced  
42 is also unclear. Finally, the reasons why empathy machines are required also raise fundamental  
43 questions for practice. As raised by Digby and Lee (2016) health care professionals face a  
44 multitude of enablers and barriers to caring empathetically for people with dementia in hospital,  
45 such as lack of time and resources, therefore provision of training is only one small step in the  
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3 process. Virtual reality therefore represents only a partial answer to enhancing the care  
4 delivered to a person with dementia.  
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10 The findings from this study reflect a growing body of evidence on the utilization of simulation  
11 training across professional groups (Pan et al., 2016; Piot et al., 2018), caregivers (Wijma et  
12 al., 2018) and across health and educational settings (McDougall, 2015; Elliman et al., 2016;  
13 Dyer et al., 2018). VR represents a movement away from traditional classroom based training  
14 methods, for dementia care these tended to be disease focused and failed to address the  
15 personhood behind the symptoms (Adefila et al., 2016; Epp, 2003). Whilst VR has the  
16 potential to expand understanding, the evidence base for this approach is still growing. To  
17 realize its full potential, Egan and Pott (2016) recommend that VR is not delivered in isolation  
18 rather be embedded into a structured services to ensure person centered care is delivered.  
19 Moreover in relation to the VDT® experience, the need to ensure the fidelity that such  
20 experiences represent the lived experiences of those with moderate Dementia is recommended.  
21 Furthermore, longitudinal studies measuring the effectiveness and implications of the VDT®  
22 experience across time and between groupings is required.  
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## 42 Limitations

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44 The limited amount of research on the VDT® experience indicates an area that is little  
45 understood and, as such, this evaluation sought to provide an insight. However, this is a small-  
46 scale evaluation undertaken within one geographic area in Ireland. The findings are based  
47 upon a small sample mainly representing females in their 30s and 40 occupying professional  
48 positions with many reporting limited contact with people suffering with dementia.  
49 Furthermore, it was not explicitly recorded how many participants may have accessed the  
50 VDR® experience previously. Finally, the views of those who declined to be interviewed may  
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3 have differed from those reported. These issues combined may have introduced bias and  
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5 limited generalisability.  
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10 These limitations suggest that the results need to be interpreted with caution. Future research  
11  
12 should focus on recording pre and post measures and assess the long-term impact of the VDT®  
13  
14 experience. Whilst the findings add to a growing body of evidence on the VDT® programme  
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16 (Beville, 2014; 2002), further research is required to confirm many of the claims reported in  
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18 the literature (Beville, 2014; Adefila et al., 2016, Doube & McGuire, 2016) and the  
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20 development of empathy.  
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## 26 **Conclusion**

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28 In this study, the VDT® experience appears to be a learning tool, which immerses the  
29  
30 participant into experiencing the imagined reality of having dementia and emotional  
31  
32 consequence of that experience. Empathy was viewed as a multi-dimensional phenomenon,  
33  
34 with emotional, moral, cognitive and behavioural (communication) components. Participants  
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36 reported the emergence of an empathic response. This study provides an insight into the  
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38 different components but calls for further research in this area.  
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45 There are several arguments in favour of virtual simulation in health care such as enabling  
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47 participants to learn in a simulated risk-free environment and perform. However, virtual  
48  
49 simulation training reflects an imaged experience of what it is like to live with dementia and  
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51 the lack of evidence exists that it results in demonstrable behaviour change. In conclusion,  
52  
53 virtual reality programmes provide additional opportunities to enhance skills and ability to  
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55 offer a practical person- centred approach to developing an awareness of dementia from the  
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57 viewpoint of the person.  
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For Peer Review



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**Table 1: virtual reality programmes for dementia training**

| Title  | Brief description   |
|--|---|
| Virtual Dementia Experience™ (VDE™) (Alzheimer's Australia Vic 2014) | A high resource interactive environment intended as an experiential learning exercise. It involves 10 x 2.5 metre projections and uses gaming technology to draw the person into the imagined lived world of the person with Dementia.  |
| myShoes project (Ball, Bluteau, Clouder, Adefila, & Graham, 2015).   | The developers used a stereoscopic head mounted device and gaming technology to immerse the wearer into an avatar body and this allowed them to make new connections with a persona that is not their own. Participants are required to complete a few scenarios, whilst using a think aloud technique (Cotton & Gresty 2007) to provide immediate access to the thought processes occurring during immersion and reflect in real time on the experience. The session concludes with a debriefing exercise, aimed at promoting interactive learning (Rall et al., 2000).  |
| Virtual Dementia Tour (VDT®) (Beville 2002; 2014)                    | Beville (2014) indicates that the VDT® programme mimics the symptoms of level 4, moderate dementia. Participants are not briefed about the VDT® process prior to entry. The VDT® process manipulates both physical and cognitive elements in a standardised format and timeframe. It starts by creating the physical symptoms of age, such as the subject wearing yellow-tinted goggles that mimic the effects of eye disease. They also wear gloves and insoles, which have corn kernels inbuilt creating painful sensations, similar to pain caused by peripheral nerve damage. The gloves are designed to make |

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it difficult to use your hands, similar to the subject suffering from arthritis. The cognitive effects of dementia are re-created by the use of noise delivered via headphones, which helps to induce a chaotic mental state, similar to what some people with dementia experience. During the VDT, the subject performs simple tasks such as pair socks. To enable reflection to occur, subjects can observe other subjects from an observatory area to consider the verbal and non-verbal reactions to the experience. The session concludes with an opportunity to observe others and then attend a debriefing exercise.

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**Table 2: Four components of empathy**

| Component   | Definition  |
|-------------|---|
| Emotive     | The ability to subjectively experience and share in another's psychological state or intrinsic feelings.                |
| Moral       | An internal altruistic force that motivates the practice of empathy.  |
| Cognitive   | Intellectual's ability to identify and understand another's person's feelings and perspective from an objective stance. |
| Behavioural | Communicative response to convey understanding of another's perspective.  |

(Source: Mercer & Reynolds 2002 pS10)

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**Table 3: Disciplines of sample**

| Disciplines   | Total of participants that took part (n=18)<br>No (%) |
|---|---|
| Front line staff (i.e. Registered Nurses, Healthcare Assistants)      | 5 (28%)   |
| Carers and befrienders  | 4 (22%)   |
| Senior Management including Service Managers and Directors of Nursing | 6 (33%)   |
| Allied Health Professionals (AHPs)                                    | 1 (6%)  |
| Medical/Psychiatry staff  | 1 (6%)  |
| Other such as educationalists and Dementia service managers           | 1 (6%)  |

**Table 4: Demographic characteristics of participants**

| Category   | %e    |
|--|-------|
| <i>Gender</i>  |       |
| Male   | 16.7% |
| Female   | 83.3% |
| <i>Age</i>   |       |
| 18-24  | 5.6%  |
| 25-34  | 5.6%  |
| 35-44  | 38.9% |
| 45-54  | 33.3% |
| 55-65  | 16.7% |
| <i>Position</i>  |       |
| Front line staff (i.e. Registered Nurses, Healthcare Assistants) | 27.8% |
| Senior Management  | 33.3% |
| Carers   | 22.2% |
| AHPs   | 5.6%  |
| Medical/Psychiatry staff   | 5.6%  |
| Other i.e. academic  | 5.6%  |
| <i>Qualification</i>   |       |
| Degree   | 23.1% |
| Diploma  | 30.8% |

|                        |       |
|------------------------|-------|
| Masters/PhD            | 38.5% |
| Other i.e. certificate | 7.7%  |

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