1 **Simulation Based dementia training: impact on empathic understanding and**
2 **behaviour among professionals and carers.**
3

4

5 **ABSTRACT**

6 *Background:* Simulation-based experiences provide learning opportunities into the world of

7 people living with dementia, however limited research into its effectiveness exists.

8

9 *Methods*: A quasi-experimental design was used to examine the impact of the virtual dementia

10 tour on empathetic thinking, understanding and person care. Study participants included carers

11 and multi-health professionals (n=223).

12

13 *Results:* Empathetic understanding of symptoms, its impact on the provision of person-centred

14 practice were all scored as neutral. Significant positive changes were reported on all measures

15 post intervention, across all demographics.

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17 *Discussion:* Virtual reality offers an opportunity to understand the isolated, fragmented and

18 confusing world of the person with dementia.

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KEY POINTS

1. Stimulated based experience provides a new and innovative method to provide experiential learning opportunities into the <mark>hard-to-reach</mark> world of people living with dementia.

2. *Findings suggest that participants roles in simulation-based experience led to a significant positive change in empathetic understanding and the behavioural impact of the condition on the person.*

3. *Virtual reality training programmes offer <mark>nurses and all health professionals</mark> an opportunity to understand the often isolated, fragmented and confusing world of the person with dementia.*

KEYWORDS

Dementia, health professionals, empathy, virtual reality, simulation, quasi-experimental research

INTRODUCTION

The use of virtual reality technologies in health professionals training continues to increase as new technological advances continue to evolve, and new conceptualised uses emerge (Hattlink et al 2015). This is particularly so in the field of Alzheimer's Disease and related Dementia's (ADRD). There has been a rise of virtual reality programmes as effective modes of dementia training including the Virtual Dementia Experience ™, (VDE) (Doube & McGuire, 2016; Gilmartin-Thomas, et al., 2018; 2020), Dementia Live ™ (Han, Kim, & Hong, 2019), myShoes project (Adefila et al., 2016) Through d'mentia lens (Wijma et al., 2018) and Virtua Dementia Tour (VDT®) (Beville, 2002; Slater et al., 2019). To date, the evidence regarding this new and developing field of research reflects its relative novelty – encouraging but limited by the lack of strong research design (Hirt & Beer, 2020).

There is an onus on health professionals to be fully aware of the theoretical knowledge of dementia and its progression, including how the condition impact on the person living with dementia. With advances in new virtual reality (VR) technologies it has become possible to mimic the lived experience of dementia (Hattlink et al., 2015), albeit in a controlled and temporal manner, in order to provide a better understanding of the world of the person living with dementia (Sulzer, Feinstein, Wendland, 2016; Fagiano, 2019). VR is deemed better than traditional learning modes as it promotes experiential learning (Wijma et al., 2018, Gilmartin-Thomas et al., 2018, Kyaw et al., 2019); promotion of a deeper empathetic understanding of dementia, awareness of its impact on emotions and subsequent behaviours (Jütten et al., 2017), and the promotion of person-centred care for people with dementia by formal (Slater et al., 2019) and informal carers (Wijma et al., 2018).

63 Different VR simulation programmes for dementia have been researched, for example in the

64 US, Beville (2002) was the first to address the use of VR technologies in understanding of

65 dementia among health professionals. Using a one sample pre-post-test design with a sample

66 of 146 health professionals, Beville (2002) reported a heighten awareness of the emotional

67 needs of people with dementia and how these emotions manifest as inappropriate behaviour;

68 and a corresponding reduction in agreement that people with dementia receive the care they

69 need. Later Doube and McGuire (2016) tested the virtual dementia experience (VDE) and

70 reported significant increases in empathetic understanding and knowledge of dementia,

71 compared to traditional classroom training among health students.

72

73 Adefila et al. (2016) employed a quasi-experimental design and assessed changes in

74 participants' attitudes using the Interpersonal Reactivity Index (IRI) (Davis, 1980) to measure

75 taking the perspective of and have empathetic concerns for others, reported that the VR

76 programme (myShoes project) increased awareness of dementia, empathy and compassion

77 among social care professionals. Later, Wijma and colleagues (2018) looked at the impact of

78 VR on informal caregivers using a small scale (n=35) pre-post intervention research design.

79 Standardised scales were used to measure perspective taking, resilience, competency and

80 positive dyadic interactions and all were found to be change positively and at a statistically

81 significant level albeit with a small sample. However, Jütten et al. (2017) failed to report

82 significant changes in the short –term (1-week post programme) and long-term (15 months) on

83 IRI measures, anxiety and depression among carers. It was the first study to look at the

84 sustained impact of the intervention. However, they did conclude significant positive impact

85 on the quality of relationship between cares and people with dementia. Gilmartin-Thomas and

86 colleagues (2018) in Australia conducted a quasi-experimental controlled study with medical

87 and pharmacy students (n=278), looking at VR teaching compared to standard curriculum.

88   They reported that the intervention produced statistically significant improvements in scores

89   beyond that of the standard curriculum on a standardised scale measuring knowledge and

90   attitudes towards people with dementia.

91

92   Building on this previous work, Slater and colleagues (2017; 2019) provided a qualitative

93   context to the impact of the intervention, reporting on small sample of formal and informal

94   carer's (n=18). Participants perceived the VDT programme as useful, and it provided an

95   opportunity to understand what it is like to think, feel and live with dementia and that it enabled

96   a behavioural and cognitive reaction to this 'lived experience'; producing an eventual moral

97   reaction regarding what constitutes effective and appropriate care for people with dementia.

98   Such findings were confirmed by Han and colleagues (2019) study that explored 28 caregivers

99   (formal and informal) using semi-structured interviews, two weeks after participation in a VR

100 training intervention. They found an increased empathy, the promotion of positive care

101 strategies leading to emotional and social benefits; and an increased awareness of aging and

102 risk of dementia.

103

104 Whilst these studies provide a framework upon which to understand the usability of virtual

105 reality for people with dementia there is a lack of research focusing on the learning outcomes

106 (Radianti et al., 2020), underpinned by a strong methodological design (Hirt & Beer, 2020). In

107 response this study aims to examine how a virtual reality programme for health professionals

108 and carers impact on understanding of the condition and in particular the empathetic

109 understanding of its impact on cognitions, emotions and behaviours.

110

111 **MATERIAL AND METHODS**

112 **Research Design**

A quasi-experimental one-group pre-test - post-test research design was used to measure change across time (3-months). A questionnaire was developed to measure empathy and understanding of the impact of dementia on thinking, emotions and behaviour (Slater, Hasson, Moore, Sharkey, 2020). A Questionnaire pack containing participant information sheet, questionnaire and support information were administered to all participants prior to the intervention and again upon completion.

Sample

Participants were drawn from across a Health and Social Care Trust in Northern Ireland that have been using the VDT ® as a training tool for people working with people living with dementia. Participation was voluntary and open to health professionals, voluntary groups and members of the community. Recruitment was via awareness posters and advertising campaign via email and social media. Clusters of 12 people per grouping participated in the training and there were two sessions per day. Over the period of two weeks, there were potentially a total of 240 participants. A response rate of 223 completed questionnaires for both time points representing a response rate of 93%. The remaining 7% (n=17) were accounted for as 4 participants completed pre-intervention questionnaires and 1 completed post intervention questionnaire were removed. The remaining participants (2.5%, n=12) either did not turn up for training or did not wish to participate in the study. Participants were emailed the questionnaire pack 3-months post intervention and asked to complete and return it. A response rate of 37% (n=82) was achieved.

Intervention

The VDT® programme claims to be a replication of stage four-five (moderate) dementia. The programme lasts 2-hours and involves 10-minutes of sensory (visual, auditory and tactile)

138   distortion using apparatus, and cognitive confusion by requiring participants to complete

139   simple tasks, such as folding clothes. This is to mimic distortion produced by the deterioration

140   of the Parietal, temporal, occipital and frontal lobe as well as the limbic system and cerebral

141   cortex. This is followed by an opportunity to watch the behaviour of another group participate

142   in distortion session. A 30-minute debriefing programme completes the training. The VDT®

143   programme uses transformative learning technique to place the participant in the realm of

144   dementia and provides participants with an imagined '*insider's view*' of the condition and an

145   opportunity to self-reflect on the experience to help better understand what it is like living with

146   the condition (Beville, 2014).

147

148   **Instrumentation**

149   Examination of the literature failed to identify a psychometrically sound tool that addresses

150   health professionals empathetic understanding of living with dementia, its impact the

151   behavioural and psychological symptoms of dementia and care provided. An assessment tool

152   was designed and psychometrically tested to measure these aspects (Slater, Hasson, Moore,

153   Sharkey, 2020). The tool development was based on previous qualitative findings (Slater

154   Hasson, Gillen, 2017) and further qualitative and quantitative research work into the effect of

155   VR on participants empathetic understanding of living with dementia and reported strong

156   psychometric properties (Slater, Hasson, Moore, Sharkey, 2020). It consisted of 15 items, rated

157   on a 5-point Likert scale ranging from strongly disagree to strongly agree, measuring 3

158   constructs - empathy, understand of behaviours and role of the person in care decisions. Four

159   additional items measured a fourth construct - experience of previous training. Additional

160   demographic details were collected and experience/importance of knowledge of dementia. All

161   four constructs had acceptable Cronbach alpha scores above the threshold of 0.7 and therefore

162   considered stable.

Procedure

An open invitation was sent via the web and email to all participants in the study in a Health and Social Care Trust. Participants self-nominated to be involved in the VDT training and allocated to a session on a first come-first serve basis. Participants were in group of 12 per session and 20 sessions were held in total (n=240). The participants were informed about the study and provided with an invitation pack. One hour prior to the intervention participants were provided with the questionnaire pack and, if willing to participate, completed the questionnaire. Participants engaged in the VDT training and then all were invited to complete the questionnaire after the intervention. Participants provided email addresses and were send an electronic version of the questionnaire three months after participation.

Statistical Analysis

Demographic details of the sample were examined to identify the characteristics of the sample. Descriptive statistics were generated for each of the items across both time points, including frequency scores and measures of distribution. Cronbach alphas were calculated for each construct and items were summated. Paired t-tests were calculated between pre and post scores. Repeated measures analysis of variance scores was calculated across the three time points to show changes on items and constructs. Analysis of Covariance was used to examine changes across time according to each of the demographic details, controlling for variability in pre-test scores.

Ethical Issues

The study was performed in accordance with the Declaration of Helsinki Full (World Medical Association, 2001). Ethical approval was sought from a University ethics committee prior to

188 commencement of the study. A completed questionnaire was indicative of implied consent to

189 use in the study. Anonymity and confidentiality were assured for all participants. A unique

190 four-digit self-completed coding system was used to ensure the anonymity of participants

191 whilst allowing questionnaires to be pair-matched for analysis. Support services were offered

192 to all participants on completion of the intervention.

193

194 **RESULTS**

195 Demographic Details

196 A total of 223 (93%) completed the programme. This represented a representative spread

197 across gender, settings and education levels (see table 1). More than two thirds of the

198 participants had not received training in dementia awareness.

199

200 *Insert Table 1 Here*

201

202 There was a good spread across health and social care professionals and informal carers (7%,

203 n=15). The major group of participants were 'Others' including psychiatrists, psychologists,

204 student nurses and student social workers (26%, n=56). The second largest group was from

205 medical or allied health professional backgrounds (23%, n=49) including occupational

206 therapists and physiotherapists. 12% were nurses (n=26), 15% (n=33) social workers and

207 fifteen participants (7%) were carers.

208

209 **The Need for Dementia Training**

210 Prior experience of dementia training and its necessity was investigated using 4 statements.

211 More than half of the participants spent at least a moderate amount of time caring for people

212 with dementia (see figure 1) and for the majority of participants required a high level of

213   dementia knowledge to allow them to do their jobs well (see figure 2). There was a moderate

214   positive relationship between working with people with dementia and the importance of

215   knowledge relating to dementia (r=.51, P<0.01).

216   ***Insert Figure 1 and Figure 2 here***

217

218   **Assessment of Prior Training**

219   Participants were asked to rate how well their previous training equipped them to understand

220   the emotional, physical and cognitive aspects of dementia. Respondents were generally happy

221   with their knowledge levels with a score ranging between 'Neutral' and 'Somewhat Agree'

222   (See table 2).

223

224   ***Insert Table 2 here***

225

226   The items were summed to provide a factor score 'Assessment of Prior Training' that looks at

227   how well previous training has provided participants with a strong evidence base of the

228   physical, emotional wellbeing impacts on the mind-set and thinking of the person with

229   dementia. The mean scores (x=3.47) for the construct shows that participants felt a slight sense

230   of agreement. Multiple regression analysis (12.7% of the variance) showed that experience

231   with working with people with dementia has an impact on training, as does the age of the

232   participant. Further examination of the linear regression shows there to be a small, positive,

233   relationship between both perceptions of prior training and frequency of working with people

234   with dementia (r=.278, p<0.01) and importance of dementia knowledge in their job (r=.20,

235   P,0.01).

236   ***Insert Table 3 here***

237

238   Pre-intervention Item Scores

239   Prior to the intervention, participants reported a general sense of ambivalence regarding the 4

240   items relating to empathetic understanding of dementia. Participants reported that they were

241   unable to think like a person with dementia x= 2.63 (see table 3) and the other 3 items were

242   similarly scored. The 7 items relating to 'understanding of the behavioural impact of dementia'

243   were scored as 'neither agree nor disagree' to 'slightly agree'. The four items relating to the

244   importance of involving or having the voice of the person with dementia in care decisions and

245   effective care was positively scored as slightly agree.

246

247   Post intervention (and 3-month follow-up)

248   There was a significant movement in opinions relating to understanding and knowledge of the

249   symptoms and behaviours of people with dementia.   All scores moved to being positively

250   scored as 'slightly agree' to strongly agree'. Statistical examination show that all 15 items

251   increased as a statistically significant level (p>0.01) post intervention. The items relating to

252   effective care also changed at a statistically significant level to an agreed level of strongly

253   agree. Examination of the 3-month follow up show that scores remained constant or improved

254   from the post intervention scores.

255

256   Summation of Items to Construct Scores

257   Further investigation of the construct scores shows there was a positive and statistically

258   significant relationship across all three constructs at pre-intervention. Correlation coefficient

259   scores show no issues of collinearity and sufficient variability in scoring to indicate that each

260   construct is measuring different aspects of care. Skewness and kurtosis were not significant

261   issues however there was a raise towards ceiling effect post intervention and follow-up.

262   Definitions of the constructs are provided in Table 4.

263 ***Insert Table 4 Here***

264

265 Repeated measure analysis of variance was conducted across the three time points on all three

266 constructs. Examination of the Mauchly's test of Sphericity show epsilon scores of greater

267 than 0.75 (Huynh-Feldt construct 1=0.956; construct 2=0.970; construct 3=0.863) indicating a

268 violation of sphericity and therefore the Huynh-Feldt correction was used.

269

270 **Empathetic Understanding of Dementia**

271 Examination of the 'Empathetic Understanding of Dementia' mean scores across the three time

272 points show that there is a statistically significant increase in scores from pre and post scores,

273 and pre and follow-up but not between post and follow-up. Repeated measures analysis of

274 variance shows there to be a statistically significant difference in scores across time points

275 $F(1.91, 153.00)=59.42$, $p<0.001$, partial eta .97.

276

277 **Understanding of Behavioural impact of Dementia:**

278 Examination of the construct 'Understanding of behavioural impact of dementia' mean scores

279 across the three time points show that there is a statistically significant increase in scores from

280 pre and post scores, and pre and follow-up and between post and follow-up. Repeated measures

281 analysis of variance shows there to be a statistically significant difference in scores across time

282 points $F(1.94, 151.64)=36.65$, $p<0.001$, partial eta .99.

283

284 **The Role of the Person in Care Decisions**

285 Examination of the construct 'Role of the person in care decisions' mean scores across the

286 three time points show that there is a statistically significant increase in scores from pre and

287 post scores, and pre and follow-up but not between post and follow-up. Repeated measures

288 analysis of variance shows there to be a statistically significant difference in scores across time

289 points $F(1.73, 138.11)=36.65$, $p<0.001$, partial eta .96.

290

291 **Analysis of Covariance of impact of intervention across Demographics**

292 Examination of the effects of demographic details (Gender, age, Occupation, setting and

293 education) on the impact of the intervention using an Analysis of Covariance show that the

294 change was noted across all groups for both the constructs empathetic understanding and

295 understanding behaviour but not provision for person-centred care. Post intervention scores

296 were compared whilst controlling for pre-intervention scores in order to get a full account of

297 whether a particular group gained more from the intervention. Only gender was found of have

298 an effect on the role of the person in care decisions ($f=6.775$, $df=102,1$, $p=0.01$) and females

299 mean scores increased from 4.22 – 4.69; males increase slightly less 4.22 – 4.55).

300

301 Participants were asked to provide feedback on the impact of the intervention of their attitudes

302 and practice. The vast majority of participants supported the programmes and almost everyone

303 (97.3%) viewed it as having a significant impact on attitudes to people with dementia. Almost

304 all participants felt that the training would have an impact on their approach to practice

305 (98.7%). All participants (100%) stated they would recommend the programme to others.

306

307 **DISCUSSION**

308 The findings from this study show that the virtual reality programme offers an opportunity to

309 participants to 'walk in the shoes' of the person with dementia and create a sense of empathy

310 thereby promoting the role of the person living with dementia in care decisions. Previous

311 research into virtual reality simulations of dementia has found significant increases empathetic

312 understanding and knowledge (Doube & McGuire, 2016; Adelifa et al., 2016), symptoms

313   (Beville, 2002; Adelifa et al., 2016), inappropriate behaviour (Beville, 2002) and missed care

314   opportunities (Beville. 2002; Slater et al., 2019). The findings from this study show that

315   participation in the programme produced a significant improvement in understanding the

316   cognitive, emotional and behavioural aspects of dementia and how this translates into person-

317   centred care.

318

319   The impact of the intervention was reported across all participants irrespective of demographic

320   details, whether acute or community settings, age, educational background, whether had

321   previous training or not, and occupation. The findings also confirm the sustainability of change

322   in attitudes and beliefs 3-months after the intervention. Few studies into the impact of VR

323   provide quantitative evidence to show the sustainability of change over time.

324

325   A better understanding of the world of the person with dementia has a significant impact on

326   the care provided by nurses and all health care professionals (Jütten et al., 2017) and it is

327   essential, given the increase in the number of people living with dementia, that we look at new

328   and innovative methods to get a glimpse of this world. Cunninghan (2006) described the world

329   of the person living with dementia as fragmented, confusing, challenging, unpredictable and

330   sometimes frightening and gaining access to this world that moves our understanding beyond

331   the physical deterioration of the body/brain is not addressed in many traditional methods of

332   education (Jütten et al., 2017). Jeffery (2016) reported that current traditional training methods

333   and subsequent practice fail to promote or display empathy; yet Ahrweiler et al (2014) reported

334   that individuals who are more empathetic were found to provide better care and increased

335   patient satisfaction and clinical outcomes. The rise in the use of VR technologies to allow

336   access into the 'hidden world' of people living with dementia and provides participants with a

337 safe and managed albeit brief exposure to their world – to walk in their shoes (Beville, 2002;

338 Adefilifa et al., 2016; Slater et al., 2019).

339

340 Limitations

341 The challenge to future research into the use of VR technologies is to provide demonstrative

342 evidence of tangible and longer-term impact of the intervention on care for the person with

343 dementia.   To date the evidence on VR interventions have focused on attitudinal change

344 towards people with dementia (Beville, 2002; Adelifa et al., 2016; Doube & McGuire, 2016).

345 This is an encouraging starting position but, Slater et al. (2019) highlight that care occurs with

346 many competing demands (inadequate staff or time, resources etc) that may interfere with or

347 eventually diminish the translation of new attitudes into practice. Further research is required

348 to look at the facilitation and implementation of VR change in practice, embedded within a

349 structured programme in dementia care and not be seen as a standalone package (Egan and Pot

350 2016).

351

352 **CONCLUSIONS**

353 There is a clear need for new and innovative methods of training health professionals in

354 dementia awareness that moves beyond the physiological changes to include a better

355 empathetic understanding of the condition. Virtual reality technologies provide a temporary

356 and conditional insight into the world of dementia, but the insight can have a significant impact

357 on the individual's attitudes and beliefs for the better. This can impact on empathy for the

358 person with dementia and improve understanding of symptoms and behaviours.

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364

365 **DECLARATIONS OF INTEREST**

366 The authors declared they have no competing interests.

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471   **Figure 1.   Participants response to 'How frequently do you work with people with**

472   **Dementia?'**

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worked with people with dementia
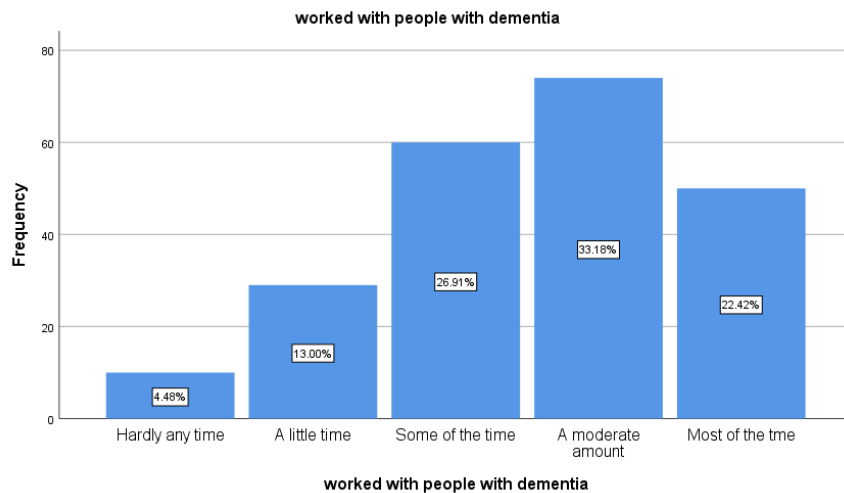
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Figure 2. Participants response to 'How important is it for you to have a high level of dementia knowledge to enable you to do your job well'?

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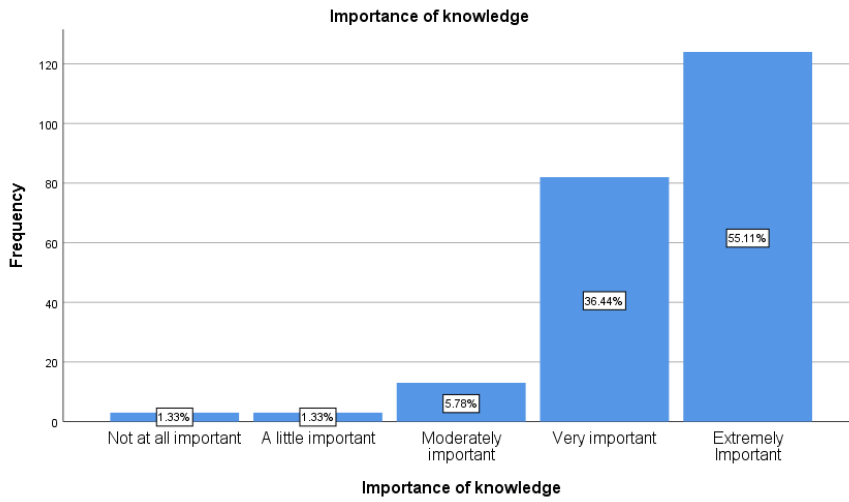
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491 **Table 1. Demographic profile of attendees**

Gender		Age		Education	
Female	91.5 (205)	18-24	8.4 (19)	Degree	42.5 (88)
Male	8.5 (19)	25-34	20.0 (45)	Diploma	25.6 (53)
		35-44	21.8 (49)	Masters and higher	5.8 (12)
Setting		45-54	27.6 (62)	Other	26.1 (54)
Hospital	25.0 (53)	55-64	17.8 (40)	**Previous Training**	
Community	70.3 (149)	65+	4.4 (10)	Yes	31.0 (70)
Voluntary	4.7 (10)			No	69.0 (156)

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Table 2. Frequency scores of 'Assessments of Prior Training'

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean (SD)
My previous training lets me know what the physical symptoms of dementia are.	3.9 (9)	10.2 (23)	23.0 (52)	52.2 (118)	10.6 (24)	3.55 (0.95)
My previous training lets me know what the emotional symptoms of dementia are.	3.1 (7)	11.6 (26)	26.2 (59)	50.7 (114)	8.4 (19)	3.50 (0.92)
My previous training lets me know how dementia effects the mind-set of the person.	3.1 (7)	12.9 (29)	25.9 (58)	49.1 (110)	8.9 (20)	3.48 (.94)
My previous training lets me know how dementia effects the thinking of the person.	3.6 (8)	17.0 (38)	29.0 (65)	42.4 (95)	8.0 (18)	3.34 (.97)

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504 **Table 3. Measures of Distribution for 15 Items in the intervention Questionnaire (****

505 **indicates statistical significance P<0.01)**

506 **Comparison of Pre (T1) and post (T2) and 3-month (T3) intervention scores on items**

		Mean	SD	Skewness	Kurtosis
I am able see things through the eyes of the person with dementia	*T1*	2.70	1.07	-.35	-.42
	T2	*4.29***	*.86*	*-1.75*	*3.85*
	T3	*4.29*	*.87*	*-1.43*	*2.29*
I am able to 'stand in the shoes' of the person with dementia.	*T1*	2.57	1.05	.47	.21
	T2	*4.11***	*.99*	*.16*	*1.26*
	T3	*4.15*	*.98*	*-1.66*	*3.20*
I feel I can understand what it's like to live with dementia.	*T1*	2.74	1.04	.18	-.68
	T2	*4.14***	*.97*	*-1.33*	*1.69*
	T3	*4.27*	*.83*	*-1.73*	*4.59*
I understand how dementia impacts on the person's thinking.	*T1*	3.08	1.01	-.33	-.68
	T2	*4.23***	*0.87*	*-1.57*	*3.27*
	T3	*4.40*	*.87*	*-2.26*	*6.51*
I understand how dementia impacts on the person's emotions.	*T1*	3.17	.96	-.37	-.59
	T2	*4.29***	*0.84*	*-1.60*	*3.50*
	T3	*4.40*	*0.82*	*-1.98*	*5.70*
I feel I can empathise with the emotional position of the person with dementia.	*T1*	3.39	.96	-.67	.14
	T2	*4.35***	*.84*	*-1.82*	*4.46*
	T3	*4.50*	*.83*	*-2.35*	*6.70*

I feel I understand what it's like to think like a person with dementia.	*T1*	2.63	1.0	.18	-.66
	T2	*4.04***	*0.97*	*-1.15*	*1.19*
	T3	*4.04*	*1.01*	*-1.32*	*1.94*
I understand how dementia can lead to aggressive behaviour in people with dementia.	*T1*	3.66	.81	-1.22	1.68
	T2	*4.57***	*0.66*	*-2.21*	*7.80*
	T3	*4.77*	*.45*	*-1.68*	*1.84*
I understand how dementia can lead to agitation in people with dementia	*T1*	3.78	.74	-1.10	1.92
	T2	*4.68***	*.53*	*-2.11*	*8.91*
	T3	*4.80*	*.40*	*-1.57*	*047*
I understand the reasons people with dementia behave as they do.	*T1*	3.49	.85	-.73	-.01
	T2	*4.48***	*.72*	*-1.97*	*6.29*
	T3	*4.72*	*0.50*	*-1.58*	*1.63*
I understand how dementia impacts on the person's physical behaviour.	*T1*	3.40	.92	-.56	-.19
	T2	*4.45***	*.69*	*-1.62*	*4.76*
	T3	*4.68*	*.50*	*-1.10*	*-0.7*
Empathy is important for me to organise the effective care of a person with dementia.	*T1*	4.32	.79	-1.79	5.25
	T2	*4.78***	*.43*	*-1.55*	*.91*
	T3	*4.91*	*.32*	*-4.09*	*17.72*
I need to consider the person's emotions in order to provide effective care for a person with dementia.	*T1*	4.31	.85	-1.83	4.57
	T2	*4.78***	*.50*	*-3.13*	*15.0*
	T3	*4.89*	*0.35*	*-3.38*	*11.83*

In order to ensure effective care, I involve the person with dementia in care decisions.	*T1*	4.15	.87	-1.24	2.27
	T2	*4.57***	*.71*	*-2.05*	*5.57*
	T3	*4.67*	*.52*	*-1.24*	*0.57*
I ask a significant other/family member about a person with dementia's emotional wellbeing in order to organise effective care.	*T1*	4.12	.94	-1.29	1.81
	T2	*4.59***	*.58*	*-1.28*	*1.37*
	T3	*4.67*	*.59*	*-1.63*	*1.64*

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509 **Table 4. Construct scores for the constructs across the various time points**

Construct Definition	Mean	SD	Skew	Kurtosis
Training in Dementia care: How well previous training has provided participants with a strong evidence base of the physical, emotional wellbeing impacts on the mindset and thinking of the person with dementia.	3.47 ---	.82 ---	-.64 ---	0.91 ---
Empathetic understanding of the impact of Dementia: The ability for participants to empathically understand and interpret the impact of changes caused by dementia on a person's emotions and thinking patterns.	2.79 *4.19* *4.28*	.73 *.93* *.77*	.01 *-1.52* *-1.90*	-.24 *3.57* *4.65*
Understanding of Behavioural impact of Dementia: Understanding of the impact of emotional and cognitive changes caused by dementia translated into behaviours such as agitation, aggression etc.	3.65 *4.61* *4.74*	.69 *.56* *.40*	.85 *-1.95* *-1.30*	1.12 *7.59* *0.7*
The Role of the Person in Care Decisions: The role of taking a holistic perspective to people with dementia and empathetic understanding in the provision of effective care.	4.35 *4.74* *4.78*	.76 *.43* *.32*	-1.68 *-1.31* *-1.95*	4.54 *0.91* *3.90*

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