

**Exploring the utility of Self Determination theory in complex interventions in multimorbidity: A qualitative analysis of patient experiences of the CARE Plus Intervention. (words 4997)**

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1 Abstract

2 Objectives

3 CARE Plus is a primary care-based complex intervention for patients with multimorbidity living  
4 in areas of high socioeconomic deprivation. This study explores patients' experience of the  
5 intervention and whether Self-Determination Theory (SDT) is useful to understand reported  
6 impacts.

7

8 Method

9 Thematic analysis of semi-structured interviews of 14 participants conducted during a  
10 randomised controlled trial of CARE Plus. Improvement in wellbeing in daily lives following  
11 CARE Plus was estimated from participants' accounts of their experiences of the intervention.

12

13 Findings

14 Participants valued the CARE Plus consultations irrespective of perceived improvements. Six  
15 participants reported changes in wellbeing that improved daily life, three reported slight  
16 improvement (not impacting daily life) and five no improvement. Evidence of satisfaction of the  
17 three major SDT psychological needs – relatedness, competence and autonomy – was prominent  
18 in the accounts of those experiencing improved wellbeing in daily life; this group also spoke in  
19 ways congruent with more self-determined motivational regulation. These changes were not  
20 evident in those with little or no improvement in wellbeing.

21

22 Discussion

23 This study suggests SDT has utility in understanding the impact of CARE Plus on patients and  
24 may be a useful theory to inform development of future interventions to improve outcomes for  
25 patients with multimorbidity.

26 **Trial Registration:** Trial registration: ISRCTN 34092919, assigned 14/01/2013

27 **Keywords:**

28 Primary Care

29 Multimorbidity

30 Socioeconomic deprivation

31 Self Determination Theory

32 Complex interventions

### 33 **Introduction**

34 The prevalence of multimorbidity ( $\geq$  two long-term conditions) is socially patterned, being more  
35 common and occurring at an earlier age in areas of high socio-economic deprivation.<sup>1</sup> In addition,  
36 mental health co-morbidity is more common in socio-economically deprived areas<sup>1</sup> which is  
37 associated with more hospital admissions,<sup>2</sup> as well as increasing the burden on patients in terms  
38 of everyday life.<sup>3</sup> High-quality, accessible primary care that provides relational continuity and  
39 patient-centred care is important in managing Multimorbidity.<sup>4, 5</sup> However, general practitioners  
40 (GPs) in deprived areas deal with a more problems in shorter consultations compared to those in  
41 more affluent areas;<sup>6</sup> managing multimorbidity in such areas can seem like an “endless struggle”  
42 to practitioners.<sup>7</sup>

43

44 There is a paucity of research on managing multimorbidity, particularly in the context of socio-  
45 economic deprivation.<sup>8-10</sup> Designing and evaluating complex interventions to understand what  
46 works in this population is critical.<sup>9-11</sup> Models for developing interventions, such as the UK  
47 Medical Research Council’s complex intervention development framework,<sup>12</sup> and the 6SquID  
48 model,<sup>13</sup> explicitly highlight the importance of using theory to underpin intervention  
49 development; this is also recommended in designing behaviour change interventions for  
50 multimorbidity.<sup>11</sup> Nevertheless, interventions targeting people with multimorbidity often lack  
51 theoretical underpinning.<sup>10</sup>

52

53 Self-determination theory (SDT) is a theory of motivation, wellbeing and behaviour change that  
54 has been used to help understand how new behaviours can be established, and maintained.<sup>14, 15</sup>  
55 SDT has been applied in a wide variety of contexts, including health-related behaviour change,<sup>16</sup>  
56 and has recently been shown to be useful for explaining the impact of social prescribing in  
57 deprived areas.<sup>17</sup> However, SDT has never, to our knowledge, been used in the context of  
58 multimorbidity.

59

60 SDT proposes that sustained behaviour change requires satisfaction of three psychological  
61 needs: autonomy, competence, relatedness (Figure 1). Satisfaction of these needs is necessary  
62 for increased “self-determination” in an individual’s actions, which in turn contributes to a  
63 higher sense of well-being.<sup>14, 15</sup> Recently beneficence – having a positive impact on others - has  
64 been proposed as a fourth psychological need.<sup>18</sup> Self-determination theory describes a  
65 continuum of motivational regulation (Figure 1): at one end is amotivation (lack of motivation);  
66 at the other, intrinsic motivation (doing something simply for personal enjoyment and interest).  
67 In between are various stages of extrinsic motivation: from behaviour motivated by external  
68 rewards or punishments, to behaviour fully integrated with a person’s sense of self.

69

70 The CARE Plus intervention was a whole system primary care-based intervention targeting  
71 patients with complex multimorbidity living in areas of high socio-economic deprivation: its  
72 development and optimisation is described in detail elsewhere.<sup>19, 20</sup> CARE Plus aimed to improve  
73 patient’s well-being and quality of life by encouraging empathic patient-centred care and  
74 relational continuity, and supporting practitioners to focus on identifying patient priorities and  
75 setting goals (for practitioners and patients) to support self-management. A phase 2 exploratory  
76 cluster randomised controlled trial (RCT) indicated likely effectiveness and cost-effectiveness.<sup>19</sup>

77

78 Although SDT was not used in the development of CARE Plus, one way in which the relational  
79 continuity and patient-centred approach to supporting self-management could achieve  
80 improvements in patients’ quality of life and well-being is through supporting relatedness,  
81 autonomy, competence and self-determined regulation of behaviours. SDT may therefore be a  
82 useful theoretical framework through which to analyse patients’ experience of the intervention.  
83 This paper aims to explore patients’ experiences of CARE Plus and to investigate the extent to  
84 which SDT can be used to understand change in patients’ daily lives following the intervention.

85

86 **Methods:**

87 **Study Design**

88 Secondary analysis of in-depth qualitative interviews with participants who received the CARE  
89 Plus intervention collected as part of a process evaluation conducted during the RCT. The trial  
90 involved 152 participants and eight practices (four intervention; four control) in areas of very  
91 high deprivation in Glasgow, Scotland (trial registration: ISRCTN 34092919).<sup>18</sup>

92

93 **Intervention**

94 The CARE Plus intervention aimed to improve the management and outcomes of participants  
95 with multimorbidity in areas of high socioeconomic deprivation. It was developed through a co-  
96 design process involving researchers, patients, voluntary groups and primary care  
97 practitioners, and informed by the existing evidence of managing multimorbidity in this context  
98 rather than a single theory.<sup>20</sup> It provided the financial resource to allow GP practices to offer  
99 longer consultations to targeted participants. The number of consultations was not set in  
100 advance, to allow flexibility; on average, participants in the intervention arm received three  
101 CARE Plus consultations during the 12-month trial period. The consultations took place with a  
102 named practitioner, either GP or practice nurse (PN), to ensure relational continuity.<sup>19</sup>  
103 Participating GPs and PNs attended three group-based training and support sessions led by a  
104 psychiatrist and a senior researcher from the CARE plus team, before and during the  
105 intervention. These focused on how to structure consultations to provide a holistic assessment  
106 that identified participant concerns and priorities, with a focus on self-management, signposting  
107 to community resources if appropriate and the agreement of a care plan with goal setting.<sup>19</sup> A  
108 self-management pack was also available for the GPs and PNs to give to participants, which  
109 contained mindfulness-based stress management CDs, a cognitive behavioural therapy-derived

110 self-help booklet, material (written and on CD) about the intervention and self-help material  
111 (available on request from the corresponding author).

112

### 113 **Recruitment and Sampling**

114 Participating practices were asked to identify patients aged 30-65 who had two or more long-  
115 term conditions and who their GPs thought would participate in, and benefit from, the  
116 intervention.<sup>18</sup> These patients were recruited, consented and baseline data collected prior to  
117 randomisation. All participants involved in the CARE Plus intervention were asked if they might  
118 be willing to take part in a later face-to-face interview about their experiences of CARE Plus.  
119 Those who showed interest were later contacted, given the information sheet about the  
120 qualitative study, and gave written consent prior to the start of the interviews. Only participants  
121 who had received the intervention were interviewed, and efforts were made to ensure all four  
122 intervention practices were represented.

123

### 124 **Data Collection**

125 The interviews were carried out by an experienced qualitative interviewer (ROB) guided by an  
126 topic guide that aimed to explore participant's experience of the CARE Plus intervention.  
127 Originally the intention was to interview the same participants at two time points after the start  
128 of the intervention (three months and twelve months); however, it proved difficult to recruit  
129 sufficient numbers of participants who were willing to be interviewed twice. Therefore different  
130 participants were interviewed at different time points in their own homes; i.e each participant  
131 was only interviewed once. All interviewees received a £30 high street store voucher.  
132 Interviews were audiotaped and transcribed verbatim.

133

### 134 **Ethics**



135 Ethical approval was granted by the West of Scotland Research Ethics Service, reference  
136 number 11/WS/0031, prior to the start of the trial.

137

### 138 **Data Analysis**

139 To structure the analysis and allow comparison between varying levels of change, all transcripts  
140 were read independently by two researchers (MM, PH) to assess degree of change in  
141 participants' daily lives following participation in CARE Plus. Degree of change was classified  
142 using the Outcome Related to Impact on Daily Living scale (ORIDL),<sup>21</sup> a nine point scale that  
143 categorises change after an intervention according to its impact on daily life. The nine ORIDL  
144 categories were collapsed to three categories: major/moderate improvement impacting  
145 everyday life; slight improvement not impacting everyday life; and no change or deterioration.  
146 Disagreements regarding impact were resolved in discussion by two senior authors (CG,SM).

147

148 The interviews were analysed using a thematic framework approach.<sup>22</sup> The data analysis was  
149 conducted by one researcher(MM), a GP experienced in working in areas of high socio-economic  
150 deprivation under the supervision of the senior authors (CG,SM), with expertise in qualitative  
151 methods and self-determination theory. A sample of transcripts (n=4) were separately read by  
152 four members of the research team (MM,PH,CG, SM) who then met to agree the broad themes  
153 (summarised in appendix 1). One researcher (MM) then applied the broad codes, reading all  
154 transcripts repeatedly line-by-line. This paper reports on one of the broad themes (experience  
155 of CARE Plus: all experience, positive and negative, of CARE Plus within the practice, including  
156 patient doctor interaction and experience), which was then coded using the following SDT-  
157 based sub-themes:

- 158 • Relatedness
- 159 • Competence

- 160 • Autonomy
- 161 • Beneficence
- 162 • Regulation of behaviour

163 Finally, a framework matrix<sup>22</sup> was constructed to compare SDT-based sub-themes across the  
164 three ORIDL categories of improvement in participant’s wellbeing in everyday life to examine  
165 the extent to which SDT could be used to explain variation in change. NVIVO software Version  
166 11 was used to code and organise data.

167

## 168 **Findings**

169 Eight interviews were carried out three months after the start of the intervention (to explore  
170 the initial impact of CARE Plus); six other participants were interviewed at 12 months (to  
171 explore the long-term impact of CARE Plus). Most of the participants (n=8) were female, they  
172 were aged between 40 and 63. They had an average of five chronic diseases (range 2-10) and  
173 only one did not have at least one mental health co-morbidity. Further details and impact on  
174 daily life classification are summarised in Table 1. Six participants described major or moderate  
175 improvement impacting on wellbeing in daily life, three described slight improvement that did  
176 not impact daily life, and five described no overall change.

177  
178  
179  
180

**Table 1 Demographic and health characteristics and impact on daily life classification of participants participating in CARE Plus interviews**

Participant	Sex	Age (years)	Practice	Number of chronic diseases	Mental health co-morbidity	Time point when interview conducted	Impact of CARE Plus
1	F	59	1	4	Depression	3 months	Major/mod Improvement
2	M	40	2	6	Depression	3 months	No Change
3	F	54	3	5	Depression Panic Attacks	3 months	Major/moderate Improvement
4	M	51	4	6	No	3 months	Major/moderate Improvement
5	F	51	4	10	Depression Anxiety	3 months	Slight Improvement
6	M	52	1	6	Depression	3 months	No Change
7	M	63	3	4	Depression	3 months	No Change
8	F	42	4	4	Anxiety	3 months	Major/moderate Improvement
9	M	55	2	6	Depression	12 months	Slight Improvement
10	M	57	2	4	Addiction (alcohol)	12 months	Major/moderate Improvement
11	F	42	2	6	Depression	12 months	No Change
12	F	49	4	3	Depression/ Obsessional compulsive disorder	12 months	Major/moderate Improvement
13	F	45	3	4	Depression	12 months	Slight Improvement
14	F	46	1	2	Addiction (cannabis)	12 months	No Change

181 Examples of major/moderate improvement included starting a new regular social support  
182 group with friends, going into the town centre after avoiding it for years, or physiotherapy and  
183 occupational therapy referral leading to improvements in function, resulting in improved daily  
184 activities. Participants in the slight improvement group described changes such as learning  
185 basic anxiety management, understanding the link between pain and mood, and learning to use  
186 a computer, which were beneficial but without any major impact on daily life.

187

### 188 ***Participants' experiences of Care Plus***

189 Most of the participants felt the CARE Plus intervention was beneficial and valuable in some  
190 way, even if it did not result in major improvement in daily life. Two of the five participants in  
191 the no change group did not find the intervention beneficial: Participant 2 (male, 40) reported a  
192 pre-existing poor relationship with the GP that did not change; Participant 6 (male, 52) felt a GP  
193 was there to deal with 'medical issues', did not want to spend more time discussing broader  
194 issues and reported finding the CARE Plus consultations 'awkward'.

195

196 Most of the participants reported receiving longer consultations. One participant interviewed at  
197 three months, and one at 12 months, reported that their CARE plus experience was similar to  
198 their normal experience. Two did not remember receiving the CARE Plus self-management  
199 pack (given out by the GP or Practice Nurse) at all, and four had chosen not to use it.

200

201 Box 1 summarises participants' experiences of the key components of the intervention. All the  
202 participants who described longer consultations valued them. However, while those in the no  
203 change group valued the chance to be listened to they did not feel solutions offered were of use  
204 because of current personal or social circumstances. Those in the major/moderate change  
205 group, who discussed community referral, appeared to have derived value from this. In contrast,

206 those in the slight or no change groups who were signposted to community resources cited  
207 external factors as reasons why they did not engage. Most of the participants who used the self-  
208 management packs described them of being of benefit, particularly the CDs, even if only in the  
209 short-term.

## BOX 1: Patients' experiences of CARE Plus components

### Consultations

Patients in the major/moderate and slight improvement groups felt listened to, and that the extra time allowed them to better understand their illnesses, deal with more than one problem within the consultation and discuss their social context:

*"...or you're struggling with that, you don't talk about in a normal 10-minute appointment. You're only in to, to tell her what's actually wrong with you that day or do, do, do you know what I mean? That's what I really liked about that appointment because we sat and we talked about how I felt about it em, you know, like that kind of thing as well."*

Patient 3, major/moderate improvement, three months

Several of the major/moderate improvement group described how the longer consultations had provided the time and space to allow them to identify their problems and set goals around them. They also provided examples of how they had acted on these goals. Those in the no change group who had experienced longer consultations also valued the chance to spend extra time talking about their worries. However, where problems were identified they felt there was no solution due to ongoing symptoms, or social circumstances:

*"Depression would go away if you had maybe had something to do or whatever, and then you get these things to do i.e. camera club and that wee exercise club then you start greeting [crying], so you're no going to go and started greeting [crying] in front of twenty odd people. So you stay in 'til you think it goes away, right?"*

Patient 7, no change, three months

### Community referral

Several patients from the major/moderate change group, and one from the slight improvement group, were referred to other health professionals or third sector agencies with positive impacts on their wellbeing:

*"we sat and spoke about [local mental health support organisation]. Em, she's like that now, cos they've got all different things in there. So I went there. I did go there. And I really enjoyed it, it was good. I took part in wee groups, relaxation, all different things."*

Patient 13, slight improvement, twelve months

Several patients in the slight and no improvement groups mentioned being signposted, or even referred, to other agencies but they did not engage. Feeling it would not help, or other factors such as transport or finances, were cited as reasons:

*"It's alright saying 'go and do these things' but if you've not got the money to go a...'cause like I can get eh the Glasgow thing, and you get for half price, but even half price I cannae afford that either because eh finances."*

Patient 5, slight improvement, three months

### Self-management resources

Of those who used the self-management pack, the CDs were mentioned as most beneficial. One patient in the major/moderate change group found the CBT booklet really helpful to support her effort to do expand her daily activities:

*"Things that I've stopped doing because of my condition and then the other part is how you're going to reclaim your life and try and do things, write dates down that you're going to do it. I've actually did some stuff"*

Patient 8, major/moderate improvement, 12 months

210

211 **Understanding change in participants' daily lives following the CARE Plus intervention**

212 Analysis using the SDT sub-themes revealed some key differences in the three group's  
213 experience of the three innate psychological needs. These are summarised in Table 2,  
214 (motivational regulation summarised in Figure 2).

215

**Table 2: Summary of the SDT sub-themes across each of the three impact categories**

216

	Major/moderate improvement (n=6)	Slight improvement (n=3)	No improvement (n=5)
Relatedness	<ul style="list-style-type: none"> <li>• Good relationships with named practitioner</li> <li>• All had at least one positive and supportive social relationship</li> </ul>	<ul style="list-style-type: none"> <li>• Good relationships with named practitioner</li> <li>• Frictions in social relationships evident (not able to disclose suicide attempt, fights with family members)</li> </ul>	<ul style="list-style-type: none"> <li>• Most had good relationships with named practitioner but two did not (one longstanding poor relationship, one felt “over-friendly”)</li> <li>• Social isolation an issue</li> </ul>
Competence	<ul style="list-style-type: none"> <li>• Evidence of developing new skills (using a computer, getting a job) and of these improving wellbeing</li> <li>• Some demonstrated increased compliance of medication because of intervention</li> <li>• All recognised that competence restricted by their illness</li> </ul>	<ul style="list-style-type: none"> <li>• Some evidence of developing new skills (using a computer, recognising walking as a coping mechanism), but these did not appear to impact wellbeing</li> <li>• Social circumstances, and to a lesser extent illness, identified as key limiting factors to change</li> </ul>	<ul style="list-style-type: none"> <li>• Impact of chronic disease and social circumstances identified as insurmountable barriers</li> </ul>
Autonomy	<ul style="list-style-type: none"> <li>• Described health behaviours as within their control and identified things they could do to help</li> <li>• Provided examples of changing their circumstances (setting up new support group with friends, using CBT booklet to reduce social isolation)</li> </ul>	<ul style="list-style-type: none"> <li>• Two felt that nothing would change as their circumstances were outwith their control</li> <li>• One had just referred herself to local mental health team and engaged with local mental health charity, but this had not yet impacted on her symptoms</li> </ul>	<ul style="list-style-type: none"> <li>• Sense that nothing could be done to change circumstances and that things were outwith their own control</li> </ul>
Beneficence	<ul style="list-style-type: none"> <li>• One woman had started a group with friends who had similar health issues</li> <li>• One man had started to help out with his grandchildren by doing the school run and taking them swimming</li> </ul>	No examples	No examples

217



218 **Relatedness**

219 **Patient/practitioner relationships**

220 All the participants in the major/moderate improvement groups reported good relationships  
221 with their named practitioner prior to and during the CARE Plus intervention. Most also felt  
222 their relationship had improved as a result of CARE Plus, and valued this improvement:

223 *“The consultation was more relaxed. I actually felt I got to know the doctor a bit better*  
224 *as well because I was managing to spend more time with him. Sometimes you just go*  
225 *in, tell him your problems, examine you and he says 'that's what's wrong'. But it*  
226 *wasn't like that. I got to.....He made me feel more relaxed for some reason. I don't*  
227 *know why.”*

228 Participant 8, (female,42), significant improvement

229

230 One participant in the major/moderate improvement group felt she had a good relationship  
231 with her GP but had only seen him once during CARE Plus. She found the CBT booklet in the  
232 self-management pack helpful to identify things she had stopped doing because of her  
233 symptoms and to motivate her to do them again. She also had a very supportive key worker who  
234 had been instrumental prior to the intervention in helping her set goals to increase her physical  
235 activity.

236

237 One participant in the minor to slight improvement group felt her relationship with her GP had  
238 improved during CARE Plus; the other two in this group felt their relationship had not changed  
239 but was good to start with. Most in the no change group also appreciated and valued their  
240 relationship with their named practitioner, and said the intervention had not changed it. Two  
241 described dissatisfaction with their relationship with their GP: one felt he had a longstanding

242 bad relationship, the other that she was 'overly-friendly' with her GP, which stopped her  
243 confiding difficult things.

244 *"[they] know me too well – what is, in a way, sometimes I think I maybe walk up and I go in*  
245 *and then don't end up telling them what I'm there for.... me and the doctor end up,*  
246 *laughing about something and I actually – and then I think, 'No, I don't wanna talk about*  
247 *what I came here for', which I know sounds really strange"*

248 Participant 11, female, 42, no change, 12 months

249

250 For both these participants, the pre-existing relationship with their practitioner prevented them  
251 from being honest about their problems or following advice during CARE Plus consultations.

252

### 253 **Relationships with other people**

254 As the interviews focused on participants' experiences of CARE Plus, much of the accounts of  
255 relatedness focused on the participant's relationships with their named practitioner.

256 Nevertheless, all participants in the major/moderate improvement group also described at least  
257 one other important relationship, specifically with a family member or social care professional.

258 In contrast, the slight improvement group all described having more limited social support, with  
259 many relationships mentioned appearing to be unsupportive or even obstructive:

260

261 *"my daughter's out at work all day right enough but sometimes me and her clash as well*  
262 *and that causes anxiety and that, all 'cause me and her are sometimes fighting and arguing*  
263 *and things, and that kinda causes anxiety. But it's only because she's really the only other*  
264 *adult that I see apart from sometimes if I go round to my mammy. I don't see any other*  
265 *adults"*

266 Participant 5, female, 51, slight improvement, 3 months

267

268 Most of the participants in the no change group appeared very socially isolated, and the  
269 relationships they described were often problematic.

270 *“People say to me ‘god I know how you feel I’m on my own myself’. I says ‘Are you? Did your*  
271 *grandson stay last night?’ ‘Aye’ ‘Did your daughter came over to visit you this morning?’*  
272 *‘Aye’. ‘You’re not on your own I’m here 24/7, the door doesnae go, the phone doesnae go,*  
273 *nothing. So I wake up ‘what’s the point of getting up? What’s the point of cleaning up?’*  
274 *Right so you get up... och I go back to my bed.”*

275 Participant 7, male, 63 No change, 3 months

276 In this intervention poor relatedness either in relationship with their practitioner, or social  
277 isolation, appeared to have a particularly negative impact on wellbeing. The narratives of those  
278 who experienced major/moderate change appeared to demonstrate a greater degree of  
279 relatedness compared to other groups.

280

## 281 **Competence**

282 Those in the major/moderate improvement group all reported how the goals they had set  
283 themselves during the CARE Plus intervention helped them feel more competent (e.g., reducing  
284 anxiety by attending self-management classes, learning to use a computer by enrolling in local  
285 classes, getting a job).

286

287 Several participants who had not been taking their medication prior to CARE Plus started to do  
288 so as the consultations made them focus more on their health. For one participant

289 understanding the difference these changes made in reducing the risk of a stroke (a major  
290 worry as her mother had died of one) was a markedly positive achievement:

291 *“she actually phoned me the next day and said to me that, you know em, going through*  
292 *everything my weight and stuff like that blood pressure and things, em that I had actually*  
293 *reduced my chances of having a stroke to 11%, which I says to her ‘oh you’re joking’. I says*  
294 *to her ‘I knew it would reduce it considerably but I didnae think it would be as good as*  
295 *that’. She says ‘so that’s fantastic’. So I put the phone down and I thought ‘oh how good is*  
296 *that!’”*

297 Participant 3, female, 54, major/moderate improvement, three months

298

299 All the participants interviewed described negative impacts of multimorbidity on daily life (eg.,  
300 pain restricting physical activities), and thus how their sense of competence was compromised.  
301 However, while the participants in the major/moderate group acknowledged how pain, lack of  
302 mobility or low mood impacted their everyday life, they were open to trying new things that  
303 might help.

304 *“I can’t do it now there’s nothing I can do about it and that’s it just got to accept it. But*  
305 *there’s one thing I can’t accept at the moment is not being able to dance and I’m hoping that*  
306 *this [pain clinic] with the pain management em it’s eh to be a I think it’s a talk group as well.*  
307 *So I’m hoping that maybe they’ll come with a few suggestions on how to cope and so I’m*  
308 *going in open minded and I’ll take it from there to see, see what happens from there”.*

309 Participant 4, male, 51, major/moderate improvement, 3 months

310

311 Most participants in the slight improvement group also reported some degree of increased  
312 competence as a result of the CARE Plus intervention (e.g. learning to use a computer, new  
313 relaxation skills). However, this did not impact on everyday wellbeing. They frequently cited

314 personal and social circumstances as key barriers. For example, one participant felt  
315 psychologically unable to move on from a difficult work situation from over a decade  
316 previously. For another, shame and embarrassment related to obesity, angina symptoms, and  
317 reduced finances stopped her being able to make any further changes, even when she knew  
318 these would help.

319 *“like I’ve got to take a heart spray for my if my, if I’m getting pains in my chest. I do get*  
320 *puffed out dead easy. So I’m not as fit as maybe....a lot of them, some that go to these*  
321 *classes and the lassies are like that (holds up little finger) and it never used to bother me*  
322 *when I was thingmy, when I used to go. I wisnae as heavy ever as heavy as this right*  
323 *enough. And it doesnae bother me to go to exercise classes ‘cause I thought ‘well I’m here*  
324 *to help myself and lose weight’ but for some reason now I feel a bit more embarrassed.”*

325 Participant 5, female, 51, slight improvement, three months

326

327 In the no change group, the impact of their illnesses and social circumstances were felt to be  
328 insurmountable barriers. Most of this group dwelt specifically on poor mental health as a reason  
329 for being unable to do things.

330

331 *“I started going back. But I stopped going recently because of all this greeting (crying)*  
332 *again. I’m, no going to sit in a club and started greeting right. So this em greeting thing*  
333 *really affects me. As I say I can be alright and then I start greeting”*

334 Participant 7, male, 63, No change, three months

335 All but one of the interviewees had mental health problems, the severity of which was not clear  
336 from the interviews. The major/moderate group discussed their mental health in the context of  
337 strategies they had used that helped (support from friends, psychological therapies). In contrast

338 the no change and slight improvement groups tended to focus on what they could not do, and  
339 demonstrated a reluctance to try new things.

340

### 341 **Autonomy**

342 The major/moderate improvement group tended to discuss changes in their behaviours, and to  
343 some extent their health, as being within their own control. One woman had started a support  
344 group herself after a suggestion from her GP. This had provided her and her friends, with a  
345 sense of some control in their daily lives, even though at the time of interview they were waiting  
346 to hear if their social security benefits would be reduced.

347 *“But em as I said to my three friends I said well if we don’t get it (financial help) we just  
348 need to meet more often and support one another”*

349 Participant 1, female, 59, major/moderate improvement, 3 months

350

351 Most in the slight improvement group, and all in the no change, perceived a sense of  
352 hopelessness that things would never change, and there was nothing they, or anyone else, could  
353 do:

354 *“To be honest, as I said, I – I just – I suppose it – If there was something they could do for  
355 me then yes, it would be, but I just feel there’s nothing, you know, out there for them to  
356 give me, if you like.”*

357 Participant 11, female, 42, no change, 12 months

358 One participant described how she was in negative equity and deemed low priority for council  
359 housing. She was struggling to focus on anything other than this and felt that what would help  
360 (accessing social housing, being able to pay off the mortgage) were out with her control. Others  
361 cited other external factors such as lack of finances, lack of local facilities or professional

362 support as key things that made them feel making changes were out with their control. At times  
363 this lack of autonomy led to anger and frustration.

364 *“Everything else, you know, is – Nothing has been right for me, and that was me doing*  
365 *what I’m supposed to do and being honest. Do you know what I mean? You’re better being*  
366 *a crook. Honestly, that – that’s why there is so many cos they get away with it all..... I’m*  
367 *paying for it with all the taxes I pay, but they’re wanting to take my sick money off me*  
368 *now”*

369 Participant 9, 55, slight improvement, 12 months

370 One participant in the slight change group did demonstrate a degree of autonomy: she had  
371 attended a local mental health group (after signposting from her GP) and had referred herself to  
372 a counselling service. Having previously put her family and friend’s needs above her own she  
373 felt she was starting to make positive changes:

374 *“I’m more – more open-minded about myself than I have been in a long long time, long time.*  
375 *It’s what I want now. It’s what I want to do that counts. it’s like basically, right now, it’s*  
376 *baby-steps, one day at a time, and one step at a time and just thinking you’re positive rather*  
377 *than negative, cos my whole life’s just been negative.”*

378 Participant 13, female, 45, slight improvement, 12 months

379 Where lack of autonomy was demonstrated in participant’s narrative, it appeared to have a  
380 negative impact on wellbeing and to be a significant barrier for future change.

381

## 382 **Beneficence**

383 Only two participants, both from the major/moderate improvement group, reported changes  
384 that related to beneficence (having a positive impact on others.) One was the participant who  
385 started a support group on the suggestion of her GP, and the other was a participant whose first

386 CARE Plus consultation had highlighted his dependent drinking and had motivated him to seek  
387 help. He then started helping his daughters by taking his granddaughters to school to give more  
388 structure to his days. These activities appeared to be important to both participants and  
389 contribute to their sense of wellbeing.

390

### 391 **Motivational Regulation**

392 Participants' accounts demonstrated examples of motivational regulation from across the  
393 motivational continuum shown in Figure 1. Figure 2 illustrates individual motivational  
394 regulation, as demonstrated in each participant's narrative, showing any change throughout the  
395 intervention.

396

397 Participants in the major/moderate improvement group appeared to demonstrate the greatest  
398 internalisation of motivational regulation during the CARE plus intervention. One woman  
399 described how, prior to CARE Plus, she had increased her physical activity with support from a  
400 worker. However, the CARE Plus consultation helped her recognise how she had also stopped  
401 doing social things she used to enjoy. She described how after her initial CARE Plus consultation  
402 she had started to increase social activities, initially motivated by a realisation she had to get out  
403 more even if not enjoyable (introjected regulation). At the end of the interview, she talked of  
404 how, three months on, she was now enjoying going to the cinema and shopping, thus  
405 demonstrating more self-determined, identified regulation.

406 *“Actually for the first time I was in the town at Christmas time, it was busy, and I enjoyed it*  
407 *and I don't know why but...I never...If it's busy I just....I never go in because if it's busy*  
408 *crowds I just don't like. It didnae seem to bother me.”*

409 Participant 8, female, 42, Significant Improvement, three months

410



411 In the slight improvement group, motivational change was less evident and regulation remained  
412 situated more towards the less self-determined end of the continuum. The participants in the no  
413 change group demonstrated external regulation or amotivation, with no evidence of any change  
414 throughout the intervention.

415 *“But I also think the doctors and the nurse have done what they can do, and if not, I know*  
416 *there’s nothing really anyone can do.”*

417 Participant 11, no change

418

## 419 **Discussion**

420 This study is the first that we know of to specifically look at SDT in the context of  
421 multimorbidity in areas of high socio-economic deprivation, where there is little evidence  
422 regarding what helps people with multimorbidity live well<sup>9, 10, 23</sup>. Analysis of qualitative data  
423 from patients who had participated in the CARE Plus intervention found that they generally  
424 valued the longer consultations with their named practitioner. However, fewer than half of  
425 those interviewed appeared to demonstrate changes in wellbeing that improved daily life, and  
426 five of the 14 reported no improvements. Evidence of satisfaction of the SDT psychological  
427 needs of relatedness, competence and autonomy was prominent in the accounts of those  
428 experiencing change affecting daily life; this group showed more self-determined motivational  
429 regulation. Thwarting of these needs was more evident in those experiencing slight or no  
430 change, with low relatedness having a particularly negative influence.

431

## 432 **Strengths and limitations of this study**

433 A strength of this study was the focus on patients living with multimorbidity in areas of high  
434 socio-economic deprivation where there have been few targeted interventions or qualitative  
435 accounts.<sup>9, 11</sup> In addition, SDT was not an underlying theory used in the development of the topic

436 guide meaning findings were not influenced by interviewer bias. It was part of a broader  
437 programme of work (thus allowing it to be placed in a wider context), much of which has  
438 already been published<sup>1, 3, 7, 19, 20</sup>.

439

440 A limitation is that only a small sample of patients were interviewed, and we cannot be sure  
441 data saturation was reached. Another is the timing of the interviews, some of which were done  
442 at 3 months, some at 12 months. However, this did not appear to influence the progress that had  
443 been made (as many patients showed progress at 3 months as at 12 months). A second  
444 limitation was that the original researcher (RO'B) who conducted the interviews was not  
445 involved in the secondary analysis, although she collaborated in the writing of the paper.

446

#### 447 **Findings in relation to wider literature**

448 Our findings of patient experience of CARE Plus are similar to those reported by the early pilot  
449 work conducted during the design of the CARE Plus intervention, where increased consultation  
450 times, continuity of practitioner and referral to community resources were all valued by  
451 participating patients.<sup>20</sup> Our findings are also consistent with previous work looking at SDT in  
452 relation to health behaviours, showing that satisfaction of psychological needs is associated  
453 with more purposeful, consistent and sustained health behaviour changes.<sup>16, 24</sup>

454

455 Previous work looking at multimorbidity in areas of high socio-economic deprivation has  
456 demonstrated the impact mental health co-morbidity has on wellbeing and the patient's  
457 everyday work.<sup>3</sup> The no change group particularly discussed the negative impact of their  
458 mental health symptoms. It could be the participants in this group had more severe mental  
459 health problems, which could have impacted on engagement with the intervention.

460

461 **Implications**

462 In RCTs of multimorbidity interventions conducted to date, few have explicitly used theory to  
463 underpin the development of the intervention or explain findings.<sup>9-11</sup> Reviews suggest  
464 interventions to improve outcomes in morbidity are likely to be complex,<sup>9,11</sup> and guidelines on  
465 complex interventions point to the importance of theory in the planning of such  
466 interventions.<sup>12,13</sup> Thus, exploring and identifying theories such as SDT to understand the  
467 underlying mechanisms of change may help guide future intervention development.

468

469 Recent reviews have highlighted the importance of careful consideration on who to target and  
470 include in any multimorbidity intervention.<sup>10,11</sup> The findings from this study suggest some  
471 patients were constrained in engaging in behaviour change by their social isolation and, in two  
472 cases, a poor relationship with their practitioner. Future interventions may need to be more  
473 specific in patient groups targeted.

474

475 While the patient accounts in this study suggested SDT was helpful in understanding  
476 behavioural change, for some patients' other (structural) factors were cited as key reasons why  
477 they could not make changes. These included lack of finances, poor transport, lack of local  
478 (therefore accessible) services (several patients stopped attending clinics when location  
479 changed) and housing problems. The importance of 'upstream' determinants of health is clear  
480 and needs to be addressed by policymakers.<sup>25</sup> Nonetheless, access to effective healthcare is in  
481 itself a determinant of health, and SDT may help in the development and delivery of targeted  
482 primary care interventions that at least mitigate some of the effects of social inequalities.

483

484 **Conclusions**

485 The study demonstrates the core constructs of SDT (relatedness, competence and autonomy)  
486 were present, and absent, in accounts of patients' experiences of CARE Plus, depending on the  
487 extent to which the intervention had impacted on their lives. Self-determination theory may  
488 have utility in the design of future interventions but further research is required to explore this  
489 further.

490

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