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1 **Efficacy of the Best Possible Selves Protocol in Diabetes Self-management:**

2 **A Mixed-Methods Approach**

3

4 **Abstract**

5 Recent research has demonstrated that positive affect may facilitate illness self-management.
6 This study used a sequential exploratory mixed-methods typology to assess whether a task
7 designed to boost positive affect (the Best Possible Self protocol; BPS) could improve
8 aspects of diabetes self-management, specifically. A qualitative investigation explored people
9 with diabetes' (n= 20) views regarding BPS feasibility and acceptability while a subsequent
10 quantitative investigation assigned people with diabetes (n= 50) to a BPS or non-BPS
11 condition and assessed affect and behaviours over a four-week period. Findings indicated that
12 individuals were receptive to the BPS and that it provided benefits for diabetes self-
13 management.

14

15 **INTRODUCTION**

16 Diabetes mellitus remains a major public health concern in countries across the world (Zhou
17 et al., 2016). Following diagnosis, effective self-management of diabetes can be challenging
18 (Teixeira, 2017; Fritz, 2017) due in part to the negative emotions associated with doing so
19 (Strandberg et al., 2014; Camara et al., 2015). Diabetes self-management is an imperative, if
20 difficult, skill that entails regular monitoring of glycaemic (blood glucose), blood pressure,
21 and LDL-cholesterol levels (Rutter and Nesto, 2011) as well as considerable lifestyle
22 modification (e.g., being active, healthy eating, adhering to medication) (Chen et al., 2013).
23 Improving management strategies is key to decreasing the likelihood of diabetes-related
24 morbidities such as cardiovascular problems, neuropathy, and kidney damage (Turner et al.,
25 1998). However, elevated levels of depression, anxiety, and diabetes related-distress have

26 shown to disrupt lifestyle behaviours and are therefore associated with poorer clinical
27 markers (such as HbA1c; an indicator of blood glucose levels over the previous 2-3 months),
28 indicating an increased risk of morbidity and mortality (Strandberg et al., 2014). As such,
29 psychology has an important role to play in addressing the emotional aspects of diabetes self-
30 management.

31

32 However, though traditional psychological interventions such as Cognitive Behavioural
33 Therapy (CBT) are routinely used to address issues associated with co-morbid mental health
34 issues (Ismail et al., 2004), they have demonstrated mixed results in improving diabetes-
35 related clinical markers, despite their connection to distress (Uchendu and Blake, 2017). It
36 has been argued that CBT, by attempting to teach individuals to control diabetes-related
37 thoughts and feelings in order to “eliminate” distress, may not be appropriate for this
38 population as self-management behaviours, by their nature, evoke thoughts of diabetes and
39 reactions to its dangers (Gregg et al., 2007). One alternative is to utilise psychosocial
40 interventions that protect the individual against the damaging effects of distress (Pascoe et al.,
41 2017). One way to do this is to facilitate positive affect, which has shown to counter against
42 emotion dysfunctions (Garland et al., 2010). The broaden-and-build theory of positive
43 emotions specifically suggests that positive affect helps to ‘broaden’ one’s behavioural
44 repertoire by encouraging new ways of thinking and doing and, in turn, ‘building’ lasting
45 resources that can be drawn on in times of crisis (Fredrickson, 2004). ‘Positive’ interventions
46 built on these principles help to cultivate positive emotions (Sin and Lyubomirsky, 2009) and
47 have seen widespread utility across a variety of health topics (Moskowitz et al., 2017; Peters
48 et al., 2017). Early attempts to develop such positive interventions for a population with
49 diabetes have shown to be equally promising (Cohn et al., 2014), though further investigation
50 is required.

51

52 The aim of the present study, therefore, was to develop and subsequently assess a novel
53 positive intervention for utilisation in the context of diabetes self-management. A decision
54 was made to modify, rather than develop from scratch, an intervention that could be used by
55 people with type 1 and type 2 diabetes. The Best Possible Self (BPS) exercise was deemed an
56 ideal candidate for this context because it is a brief, self-administered task shown to help
57 people better manage their emotions (Loveday et al., 2016). Furthermore, the BPS's
58 underlying mechanisms of action have also been conceptualised in the context of a second
59 theory: self-regulation theory (SRT) (Bak, 2015; Dark-Freudeman and West, 2016; Markus
60 and Nurius, 1986; Vandellen and Hoyle, 2008) which denotes one's ability to alter and adjust
61 their beliefs and actions, and typically involves goal-directed behaviour (Hagger, 2010).
62 Fundamentally, the BPS is a writing procedure that requires people to imagine and write
63 about an optimistic future in which they have accomplished their life goals (King, 2001: 801).
64 This activity has shown to generate positive emotions (Meevissen et al., 2011), reduce
65 negative affect (Yogo and Fujihara, 2008) and, importantly for this context, produce physical
66 health benefits by notably alleviating illness symptoms (Maddalena et al., 2014) and reducing
67 the number of medical visits (Austenfeld et al., 2006; Austenfeld and Stanton, 2008; King,
68 2001).

69

70 To best evaluate the BPS in the context of diabetes self-management we employed a
71 sequential, exploratory mixed-methods design, consisting of a qualitative phase followed by a
72 quantitative investigation (Creswell and Plano Clark, 2007). This approach had the potential
73 to offer greater breadth and depth of understanding regarding the utility of BPS in a diabetes
74 context, specifically by allowing some degree of triangulation to corroborate findings
75 (Bishop, 2015). The qualitative study used one-to-one interviews and a focus group to first

76 assess general acceptability and feasibility of the BPS amongst people with diabetes. Further
77 modifications to the BPS would be implemented based on feedback from this phase, if
78 necessary. The quantitative study then took the form of an exploratory study to analyse the
79 BPS's actual influence on diabetes behaviours and emotional factors (i.e. affect and
80 psychopathology). Consistent with results from previous research (Loveday et al., 2016;
81 Maddalena et al., 2014; Austenfeld et al., 2006; Austenfeld and Stanton, 2008; King, 2001), it
82 was expected that constructed themes and/or group differences would demonstrate the appeal
83 of the BPS as well as its utility for generating positive affect and improving health and
84 wellbeing in people with diabetes.

85

86 **METHODOLOGY**

87

88 **Study sample and Recruitment**

89 Given the paucity of research in this area, we felt it was essential to explore the utility of the
90 BPS as broadly as possible. People with diabetes were recruited for both phases of the study,
91 irrespective of their T1D and T2D status. Though each etiopathogenetic classification comes
92 with obvious and markedly different biological and psychological profiles (American
93 Diabetes Association, 2014; Shields et al., 2015; de Groot et al., 2016), there was no
94 literature to justify excluding one form over the other, especially as the task is non-
95 prescriptive in nature. In other words, an individual (regardless of diabetes status) could
96 consider their 'Best Possible Self' and set their own individualised goals that accounted for
97 their own experiences and self-management issues without being disadvantaged compared to
98 someone with a different diagnosis, at least in theory. The study was advertised primarily by
99 emailing multiple diabetes support groups whose contact details could be found online (or
100 were available through prior contact), and also by attending routine monthly meetings of

101 three local diabetes support groups in the North West of England and making direct face-to-
102 face appeals to the audience. The aforementioned local support groups were affiliated to
103 Diabetes UK, a British-based charity that supports people with diabetes and health
104 professionals across the country (Diabetes UK, 2009). The investigation was also advertised
105 online on various forums and social media platforms. The qualitative study consisted of
106 telephone interviews and a focus group session (November 2016 – March 2017), and
107 involved 20 participants in total. The quantitative phase took the form of an exploratory study
108 with a sample of 50 participants (March 2017 – January 2018). Ethical approval for the study
109 was obtained from the Liverpool John Moores University Research Ethics Committee
110 (UREC). All participants were presented with detailed information describing the nature of
111 the study, and listing contact information for local counselling services. Participants were
112 required to indicate consent, prior to participation. There was no monetary incentive for
113 completing the study.

114

115 **Qualitative data collection**

116 Interviews. Performing both individual interviews and a focus group provided some data
117 source triangulation within this phase of the study (Carter et al., 2014). After each
118 interviewee (n= 12) agreed to take part, the lead researcher (BG) provided a copy of a one-
119 page ‘tailored-for-diabetes’ version of the BPS (King, 2001) via email. This BPS variant
120 began with a brief paragraph about the importance of blood glucose control (HbA1c),
121 followed by an amended version of the standard BPS protocol whereby ‘best possible self’
122 was replaced with ‘best possible HbA1c’ so that recipients could focus specifically on their
123 self-management goals (Layous et al., 2013). All interviewees were then asked several open-
124 ended questions (e.g., ‘Is it clear what you have to do?’, ‘Would you be happy to use this
125 exercise?’, ‘Is there anything that might get in the way of you doing this?’). Participants were

126 encouraged to be honest and to talk freely about their experiences while the interviewer
127 adopted the role of reflective listener. Interviews lasted 21 minutes on average. Saturation
128 was achieved by reaching “sample adequacy” whereby the depth and breadth of the
129 information gathered was deemed sufficient to be representative of participants’ views
130 (Bowen, 2008). Common themes were discernible by the seventh interview and it was
131 considered that full saturation had occurred by the twelfth.

132

133 Focus group. This event was conducted during a diabetes support group session within a
134 hospital setting. Participants constituted a convenience sample (n= 8); anyone present at the
135 meeting was eligible and invited to participate. The session began with a 10-15 minute
136 PowerPoint presentation by two of the researchers (BG & KU) highlighting the importance of
137 emotional factors in blood glucose testing and diabetes self-management. A copy of the
138 tailored-for-diabetes BPS variant (as used for the interviews, described above) was then
139 presented on the final slide of the presentation. The researchers gave a brief description of the
140 nature and purpose of the intervention, after which group members were invited to share their
141 thoughts about the exercise and its relevance in blood glucose testing and diabetes self-
142 management. During these discussions, they were presented with a PowerPoint slide showing
143 the same open-ended questions used during the interviews. The entire session lasted
144 approximately 1 hour and 30 minutes and was recorded on a digital recorder.

145

146 **Quantitative data collection**

147 The quantitative study was hosted on the online platform Qualtrics. Interested individuals
148 were provided with a URL link, whereupon they viewed participant information, describing
149 the nature of the study. They were informed their involvement in the study would last for four
150 weeks. Consenting individuals were then randomly assigned to either a BPS or Waiting List

151 Control (non-BPS) condition using Qualtrics' inbuilt 'randomizer' function. The BPS group
152 were subsequently presented with an amended version of the tailored-for-diabetes BPS, based
153 on feedback from the qualitative phase (see below) while the control group were informed
154 that they would receive the BPS at the end of the four-week study period.

155

156 **Amended Tailored-for-diabetes BPS**

157 "Take a moment to think about your best possible HbA1c level. Imagine that your
158 blood sugar levels have been very well controlled and that you have resolved
159 some of the issues currently concerning you. Imagine how it felt to achieve those
160 levels and reflect on how positive it would feel to have more control. Then, tell
161 yourself the important things you realised or the critical steps you took to get
162 there. Think of this as the realisation of your best possible HbA1c level.

163 Now, please use the next 10 minutes to write continuously about what you
164 imagined. Use the tips below to help guide you through this process:

165 1) Be as creative and imaginative as you want. Do not worry about perfect
166 grammar and spelling as this is for your private use. No one has to know what
167 you wrote down, though you may find it helpful to share and develop ideas with
168 trusted friends, family, or even your health-care team. 2) Do not feel too
169 pressured to write everything down on your first try. As you repeat this task, more
170 ideas will come to you naturally. 3) Remember, steps are often small, even the
171 critical ones. There likely won't be one big fix. You may find it easier to write
172 about more achievable things to start with such as investing in a
173 pedometer/walking app or making a decision to try different recipes more often.
174 However, if you want to write about running a half-marathon, that's okay too! 4)
175 If you find thinking about HbA1c too abstract, try focusing on another aspect of

176 your self-management. The important thing is to focus on something long-term so
177 that you can make more noticeable improvements to your health.”

178

179 Both groups then immediately completed questionnaires (Time 1; T1) assessing emotion
180 (frequency of positive and negative affect) and psychopathology (symptoms of depression
181 and anxiety) using the Positive and Negative Affect Schedule (PANAS) (Crawford and
182 Henry, 2004) and the Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith,
183 1983), respectively. Participants were then told they would be contacted four weeks later
184 (Time 2; T2) to repeat the questionnaires so that we could assess task effects. Those in the
185 BPS condition were told to use the intervening time to use the writing exercise as much as
186 they found helpful. Upon returning, they also completed the Diabetes Self-Management
187 Questionnaire (DSMQ) (Schmitt et al., 2013). The DSMQ consists of four subscales;
188 ‘Glucose Management’ (5 items), ‘Dietary Control’ (4 items), ‘Physical Activity’ (3 items),
189 and ‘Health-Care Use’ (3 items). One additional item assessed the individual’s perceptions of
190 their ‘Self-Care’ activity. Sub-scale scores were calculated individually and a total overall
191 DSMQ score was also computed. Cronbach Alpha’s for the HADS were 0.87 (anxiety) and
192 0.81 (depression) whilst they ranged from 0.69 (Glucose Management) to 0.91 (Health Care
193 Use) for the DSMQ.

194

195 **Qualitative Analysis**

196 The primary researcher (BG) transcribed audio-recordings of the interviews and focus group
197 session verbatim. The data were analysed using Thematic Analysis (Clarke and Braun, 2017).
198 Transcripts were read and re-read by the same researcher (BG), in order to familiarise
199 themselves with the breadth and depth of data. Initial codes were then generated
200 systematically on a line-by-line basis. Codes were collated into a large number of candidate

201 themes. These initial themes were reworked and constantly checked against the data until
202 only a smaller set of super-ordinate and master themes remained. The final themes were then
203 written up as a series of draft result sections that were scrutinised and reworked by the
204 research team. After key themes had been derived, the researchers met to discuss and reflect
205 on the analytical process. Final results were also discussed amongst the research team.

206

207 **Quantitative analysis**

208 Given that the BPS is intended to work by facilitating positive affect and has shown to reduce mental
209 health symptoms, the PROCESS SPSS dialogue (version 2.15) (Hayes, 2013) was used to assess
210 direct and indirect BPS effects. This would allow us to understand the mechanisms by which the BPS
211 was achieving its effects in this context. Specifically, the PROCESS dialogue was used to examine
212 whether BPS exposure (at T1) improved diabetes self-management at follow-up (T2), and/or the
213 aforementioned association was mediated by emotional factors (i.e. affect and psychopathology) (T1,
214 T2). Thus, the BPS condition variable was entered into the equation as variable 'X' (i.e., Predictor),
215 while each of the five diabetes self-management factors (DSMQ) were entered as variable 'Y' (i.e.,
216 Outcome). Emotional factors (PANAS/HADS) were entered as the 'M' variables (i.e., the
217 mediators), with T1 and T2 emotions evaluated as mediators in separate models. Overall, each
218 mediation model assessed three regression pathways; the effect of X on M (*'path a'*); the effect of M
219 on Y (*'path b'*), and the effect of X on Y (*'path c'*). Mediation was deemed to have occurred if paths
220 'a' and 'b' (i.e., the *'indirect effect'*, or *'a*b'*) emerged as statistically significant. The number of
221 bootstrap samples (for bias-corrected bootstrap confidence intervals) was set at 1000 with an alpha of
222 $p < 0.05$. All analysis was performed using SPSS (version 23).

223

224

225

226 **RESULTS**

227

228 **Descriptive data**

229 Table 1 shows participant characteristic data for the interviews, focus group, and exploratory
230 study. Most of the interviewees and focus group participants had T2D. The distribution of
231 T1D/T2D cases was more even for the exploratory participants, with just over half diagnosed
232 with T1D. In the combined (qualitative and quantitative) sample there was a 50-50 split
233 between T1D and T2D cases. The average number of years since diagnosis for quantitative
234 participants was just over 16 years, and a maximum value just exceeding 50 years. The
235 sample was predominantly Caucasian (68%). At least 50% were UK nationals, with other
236 nationalities stated as ‘Australian’, ‘Caribbean’, ‘German/Dutch’, and ‘Irish’.

237

.....

238

Table 1 Participant characteristics by phase

239

.....

240 **Qualitative findings**

241 Thematic analysis produced four main themes: (1) Illness Ownership, (2) Advocating a
242 Personal Approach, (3) Barriers & Facilitators, and (4) Real-world Context. The first main
243 theme included two sub-themes (‘Control and the Diabetes Experience’ and ‘Taking a Pro-
244 Active Approach’) (Table 2). The ‘Advocating a Personal Approach’ theme comprised two
245 sub-themes (‘The Importance of Personalised Care’ and ‘The Importance of Support’) (Table
246 3). The ‘Barriers and Facilitators’ theme contained three sub-themes (‘Individual Factors’,
247 ‘Motivation’ and ‘Clarity and Promoting Awareness’) (Table 4). The ‘Real-world Context’
248 theme consisted of the two sub-themes (‘Alternatives to Thinking about HbA1c’ and
249 ‘Considerations for Implementation’). Details of the first three themes are illustrated in the

250 Tables below. The final ‘Context’ theme highlighted real-world challenges associated with
251 using the BPS.

252

253 **Table 2** The ‘illness ownership’ theme (comprising two sub-themes); illustrative quotes from
254 interviewees and focus group participants

255

256

257 **Table 3** The ‘advocating a personal approach’ (comprising two subthemes); illustrative
258 quotes from interviewees and focus group participants

259

260

261 **Table 4** The ‘barriers and facilitators’ theme (comprising three subthemes); illustrative
262 quotes from interviewees and focus group participants

263

264 **Quantitative findings**

265 The mediation analysis, in assessing the BPS effect (T1) on self-management variables (T2)
266 with emotional factors (T2) as the mediating factors, revealed that there was a significant
267 direct effect for the writing exercise, Effect = 0.62 (95% CI 0.02 to 1.21), $p > 0.05$; the BPS
268 group reported greater self-care activity approximately 4 weeks post-intervention compared
269 with the control group. Emotional factors failed to mediate this relationship ($p > 0.05$). The
270 BPS had no other significant effects (direct or indirect) on the remaining four self-
271 management variables (all p 's > 0.05). The mediational analysis was then re-ran to control for
272 diabetes type (T1D, T2D) to see if this affected the direct effect of the BPS on self-care
273 activity. Results showed that accounting for this covariate slightly attenuated but did not

274 completely negate the significant BPS influence, Effect = 0.62 (95% CI 0.00 to 1.24), p =
275 0.05.

276

277 Figure 1 The direct effect of BPS exposure (T1) on self-care activity at the 4-week post-
278 intervention follow-up (T2)

279

280 **DISCUSSION**

281 In this mixed-methods study applying the BPS protocol within a diabetes context, the BPS
282 was found to be a potentially useful tool in relation to diabetes self-management. Analysis of
283 the qualitative data provided several key themes suggesting people with type 1 and type 2
284 diabetes would find the BPS useful, but would like it to have a more personalised format, and
285 perhaps refined further for a diabetes context. This supports previous academic suggestions
286 that any version of the BPS should be especially tailored for its target population (Layous et
287 al., 2013). Whilst the BPS received some initial modifications between qualitative and
288 quantitative phases of this study, further development of a diabetes-specific BPS may still be
289 required. Analysis of the quantitative data, meanwhile, indicated that the BPS improved
290 perceptions of self-care though not the actual behaviours themselves. Importantly, the effect
291 on self-care was only slightly attenuated after controlling for diabetes type, meaning that
292 people with type 1 and type 2 diabetes were receiving the same effects from the BPS.

293

294 Interview and focus group feedback suggested most participants found the BPS to be a viable
295 tool that could be incorporated into patient treatment plans to help promote person centred
296 care (Coulter et al., 2013). Several participants suggested ‘sharing’ written ideas from the
297 BPS with other individuals within their support networks. Indeed, the qualitative data
298 suggested the BPS might help strengthen doctor-patient relationships if people with diabetes

299 share ideas with their health care team. This finding is important as previous research
300 suggests doctor-patient rapport has a significant impact on clinical outcomes (Coulter et al.,
301 2015; Coulter et al., 2013).

302

303 Other important things to note include the individual's need to understand the benefits of
304 engaging with the BPS. There was frequent mention of a need to provide scientific evidence
305 so that people felt the intervention was worthwhile and valid. This point relates specifically to
306 the 'illness ownership' theme where participants emphasised that by 'taking ownership' they
307 were constantly busy making decisions and managing their diabetes. Consequently, they did
308 not necessarily want to spend more time and effort performing an exercise unless it was to be
309 of some knowable benefit. It is essential to consider some of the salient facilitating and
310 hindering factors involved with engagement with the exercise, especially at initial contact.
311 Participants considered emotions and personality traits important, with feelings of "laziness"
312 being a notable barrier for some. By contrast, resilience and will power were viewed as
313 important characteristics to have by many individuals. Individual's perceptions of their
314 agency were therefore important. Overall, the qualitative data revealed both favourable and
315 challenging features of the BPS.

316

317 Evaluation of the quantitative data showed that exposure to the BPS can improve perceptions
318 of self-care after approximately 4 weeks following initial exposure, albeit the underlying
319 mechanism for this effect may not necessarily be emotional. In this case, the broaden-and-
320 build theory (Fredrickson, 2004) may not have been an appropriate model to use. Previous
321 research suggests the BPS is effective at improving positive affect, optimism, and mood
322 (Layous et al., 2013; Huffman et al., 2014; Parks et al., 2012; Peters et al., 2010; King, 2001);
323 nevertheless, the intervention appeared to have no impact on actual diabetes self-management

324 behaviours – blood glucose control, dietary control, physical activity, or health care use.

325 Rather, these findings suggest the efficacy of the BPS in a diabetes context may be

326 attributable to complex self-regulatory mechanisms (Vandellen and Hoyle, 2008).

327

328 According to self-regulation theorists, the BPS provides people with an image of a future self

329 (that is a self-standard) which they then compare to the present self (Vandellen and Hoyle,

330 2008) so any mismatch must motivate people to modify their behaviours in order to reduce

331 the disparity (Cross and Markus, 1991; Markus and Nurius, 1986). Indeed, previous research

332 has shown that the BPS increases motivation, which may be one possible mediator by which

333 it is positively influencing perceptions of self-care (Seear and Vella-Brodrick, 2013; Sheldon

334 and Lyubomirsky, 2006). In this scenario, positive perceptions would emerge as the result of

335 being motivated by the task. Indeed, this finding, combined with the absence of a BPS effect

336 on other aspects of diabetes self-management (blood glucose control, physical activity, diet,

337 health service use), seems to validate our qualitative data. Self-care suggests autonomous,

338 deliberate, and self-initiated activity; concepts that seem to resonate with the ‘Illness

339 Ownership’ and ‘Advocating a Personal Approach’ themes. In essence, the BPS may be

340 achieving its effects in this context because it makes people with diabetes feel ‘in control’ of

341 their illness. Given that people with diabetes generally receive extensive education about self-

342 management, it is plausible the BPS activates related cognitive appraisals (e.g., perceptions of

343 ‘control’ or ‘ownership’) that then mediate its effect on self-care activities. If so, it is

344 necessary for future research to demonstrate such mediator effects.

345

346 Curiously, the quantitative data revealed that the intervention failed to influence health

347 service use, conflicting with several previous studies that reported fewer health centre visits

348 in BPS users (King, 2001; Austenfeld et al., 2006; Austenfeld and Stanton, 2008; Maddalena

349 et al., 2014). There is a need for further research to explain this inconsistency. One important
350 factor to consider here is that previous studies generally used non-clinical samples, whereas
351 the present study examined people with diabetes (although recruited through community
352 settings). Health care use in the latter group may be heavily dependent on various other
353 factors (e.g., scheduled medical testing, treatment plans). It is also plausible that a longer
354 follow-up period (i.e. greater than 4 weeks post intervention) was needed to detect whether
355 any significant behaviour changes occur (not just health care use), given the discrepancy
356 between individual's perceptions of care and their scores on actual self-management. There
357 may be lag between people's improved attitudes towards their care and a statistically
358 significant change in behaviour.

359

360 **Limitations**

361 The sample was arguably biased, as it consisted primarily of pro-active individuals
362 sufficiently motivated to participate in an interview, attend group meetings and/or complete
363 an online study. Future research should look at using larger scale trials to rigorously assess
364 this intervention using a significantly larger sample size. Furthermore, the short follow-up
365 period built into the quantitative study meant we were unable to assess long-term effects on
366 not only behaviours but on emotions and perceptions. Long-term efficacy is particularly
367 important in individuals living with a long-term condition (as opposed to short-lived illness),
368 for obvious reasons. Additionally, the impact of the BPS on clinical markers is unclear.
369 Finally, it is noteworthy that people living with diabetes in the UK receive free healthcare,
370 which may present different emotional challenges in diabetes self-management, compared to
371 those from countries without a universal health care system.

372

373

374

375 **Conclusion**

376 In conclusion, the BPS was found to have some utility within a diabetes context, but needs
377 further refinement. The procedure improved perception of self-care up to four weeks after
378 exposure but did not affect other self-management behaviours. However, behaviour change
379 may occur over time. This investigation builds on previous studies, which have demonstrated
380 the efficacy of the BPS for improving mood and general wellbeing, but not within a diabetes
381 context. To the best of our knowledge, this is the first study to evaluate the BPS in
382 individuals with diabetes. This research also highlighted the importance of personalising the
383 BPS and tailoring language accordingly for this population (National Health Service, 2018).
384 One important avenue for further research is evaluating the impact of this intervention on
385 actual physical health. Given that the BPS facilitates self-care perceptions in people with
386 diabetes, as observed here, there is a need to determine whether the protocol can help reduce
387 actual diabetes-related symptoms and clinical outcomes – previous research suggests the
388 intervention may improve health and well-being (Layous et al., 2013).

389

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542 **Table 1** Participant characteristics

Phase	Interviews	Focus group	RCT	Combined
Age (Mean/SD)	Aged 23 to 25 years (based on 6 participants – the remainder did not state their exact age) (Mean = 45.66, SD = 21.09).	Ages 40 to 70 years (Mean = 58.25, SD = 10.43).	Age 20 to 76 years (Mean = 48.66, SD = 16.99)	Aged 20 to 76 years (Mean = 49.58, SD = 17.10)
No. recruited	12	8	50	70
Females/Males, N (%)	8 Females (66.6%), and 4 Males (33.3%)	5 Females (62.5%) and 3 Males (37.5%)	38 Females (76%) and 12 Males (24%).	51 (72.85%) Females and 19 Males (27.14%)
Type 1 diabetes, N (%)	5 (41.66%)	2 (25%)	28 (56%)	35 (50%)
Type 2 diabetes, N (%)	7 (58.33%)	6 (75%)	22 (44%)	35 (50%)

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Table 2 The ‘Illness Ownership’ theme (comprising two sub-themes); illustrative quotes from interviewees and focus group participants

‘Control and the Diabetes Experience’

Control over one’s condition was seen to be very important to participants. Individuals expressed a desire to be “in charge”

- “If you sort of take responsibility for it and come out with a good result then you can feel like “oh I did that well this time... When you’ve got control you feel like you’re more... you know what you’re in for?” (K1)

One participant saw the intervention as a way of giving back control to the individual

- “What you’re doing now is putting it back in control of the person by giving them a tool that’s meaningful” (G8)

‘Taking a Pro-Active Approach’

Participants believe that taking control requires a pro-active approach

- “I think anyone who doesn’t use the available resources I think is just asking for trouble because, much as we like to say “oh yeah we can do it all, we’re fine, we’re fine”, half the time we’re not” (C7)

Becoming pro-active ultimately involves a decision to take responsibility

- “I think the doctor’s gone as far as he can go and I think it’s now completely down to me” (M3)

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Table 3 The ‘Advocating a Personal Approach’ theme (comprising two sub-themes); illustrative quotes from interviewees and focus group participants

‘Importance of Personalised Care’

Of significant importance to participants was the need for personalised care. They discussed a need to be recognised as individuals.

- “To make it feel more personal and to inspire confidence... I think there has to be a couple more strands to it. Okay? Like erm how, you know? Write down how you think you can accomplish it” (R2)

Some liked that the BPS was:

- “...an individualised erm bit of thinking which you can take reflective time on” (G8)

‘The importance of Support’

Multiple participants say the intervention as a way to open up a dialogue between patient and health care professional.

- “If you wish to share it with your diabetes team...” they have that option don’t they..? Because then that might open a further discussion with their team... because if they said something “I think I can achieve it by doing this...” I mean that’s an opening into the team to discuss what that is” (R2)
- “You’ve got, like, a sort of quick reference to say “well okay diabetic nurse/you know, dietician/whatever it is... this is what’s been going on” (C7)

Some acknowledged not every little detail needed to be shared with a professional.

- “You don’t necessarily always want to tell them EVERYTHING that’s going on... but, you know, if it’s there then they can go “oh well actually that would directly impact” (C7)

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Table 4 The ‘Barriers and Facilitators’ theme (comprising three sub-themes); illustrative quotes from interviewees and focus group participants

‘Individual Factors’

Personality frequently came up as a barrier/facilitator.

- “My personality dictates that I’m a fighter and I haven’t given up even though I’m doing the right things and not getting the results” (G11).

Some participants were concerned some would find it hard to articulate their thoughts.

- “My initial thought on looking at it was, this would not work for most people I know with diabetes because most of them would find it VERY hard to write. Most of them find it hard enough to talk” (G8)

‘Motivation’

Participants saw diabetes as a “challenge”, and the BPS was yet “another thing to do”:

- “I’m not prepared to spend that amount of time on my diabetes. I don’t live for my diabetes. I have... I have improved it once. Erm, for a fortnight...” (J10)

Therefore, the BPS needed to be quick and easy-to-use.

- “We have a lot to do anyway, we have to take our blood every day erm we have to take our medication... so having another thing to do is a bit... it is asking quite a lot of people... You need somebody who’s happy to do that and it’s not just putting something else on their plate that will stress them out further” (D9)

‘Clarity and Promoting Awareness’

The BPS may serve as a way for improving awareness.

- “I think I could get quite a lot out of it [the BPS] and a lot of, kind of, what’s the word where... self-realisation?... where you find out more about yourself” (M3)

Awareness did not always translate into action, however.

- “Has this motivated me to get myself into the gym? Erm to be honest, no not really... it’s made me... I guess it’s made me a bit more self-aware? Erm... I’m fully... I’m very aware that I need to get myself into the gym” (R6)

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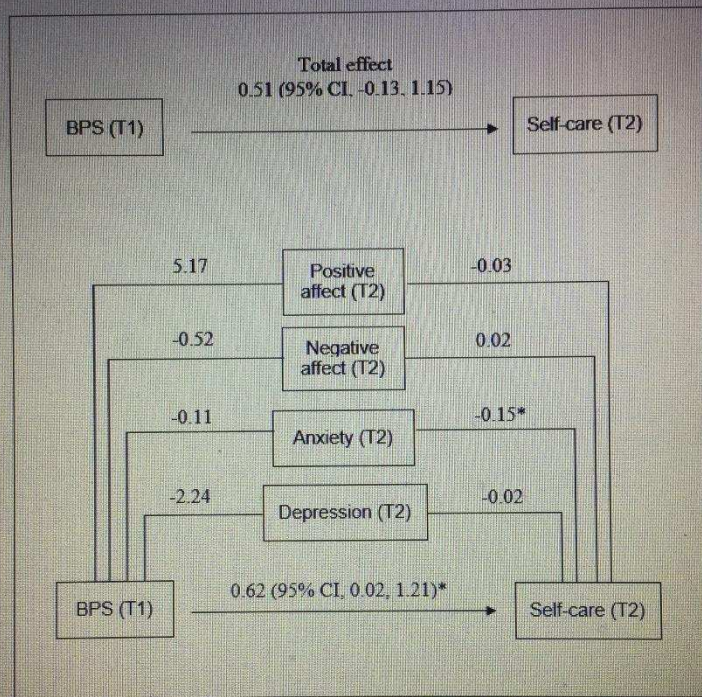


Fig 1 The direct effect of BPS exposure (T1) on self-care activity at the 4-week post-intervention follow-up (T2) (* $p < 0.05$)