Supplementary Table 1. Mechanisms of engagement and contextual factors

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| Theme | | What this theme covers | Examples of quotations |
| Mechanisms of engagement | Goals/expectations | Participant/caregiver looking at the future, what doing PrAISED might bring – this could be realistic or idealistic expectations, what is achievable, improvement vs maintenance, the risks of not doing exercise, inevitable decline vs optimism, anxiety toward end-of-programme discontinuation of support | *‘Hopefully I’m going to get better. My legs are going to strengthen. And I will be able to get up and walk about unaided, if you like, so that’s my motive’*. P2  *‘Making sure that I am as reasonably fit as I can be, so that, yes, I can do the shopping, I can get out, I can walk around or whatever. I don’t want to be trapped in here’*. P1  *‘The thing is mum had been told that she could go with her scooter on the bus, and the truth is you can’t. The difficulty with that is they give you these ideas that it’s all possible, and realistically it’s not’*. C5  *‘I think that is the challenge. You want to as I say, make that difference but you also don’t want to frighten them into this is what you could end up, down the line. So, it’s that balance isn’t it of trying to explain it in the right way’.* T59 |
| Progress, achievements, milestones | Achievements, milestones, and any progress that have promoted further engagement in PrAISED | *‘I’m feeling more flexible now. I’m accepting it a bit more. I don’t get a sharp pain or anything. And if I keep moving and doing something I seem to get away with it all right’*. P7  *‘I feel sort of slightly weary at the knees after that, but I realise it’s doing me good and that I would like to extend the distance and time we go walking’.* P18 |
| Social stimulation and interaction | How social integration or isolation affect physical activity. E.g., social opportunity of therapists’ visits as well as of community activities – change from usual routine for person and caregiver, benefits of human interaction, laughter, and banter, opening up about difficulties | *‘It was mentally stimulating for him, and it was something to look forward to. It was someone to come and chat, it was someone different to me being in the house. And I think you get to befriend that person when she comes’*. C12  *‘It’s a sociable thing really, isn’t it, from that point of view. I quite look forward to seeing her and going for a walk and letting her talk to A. (partner)’!* P1 |
| Education/ information | Therapy visits as opportunity for information for caregivers and participant – e.g., on falls, dementia, social care, disability pension, council tax exemption, medications, community groups, support, respite, planning future care | *‘The participant could do with understanding the link between exercise and mood and feelings of wellbeing and potential improvements generally in cognition. That might harness motivation’.* T57  *‘150 minutes a week sounds horrific, but it’s trying to get that information across to our people that when you break it down to half an hour a day and you can do that in 10-minute slots, and you think well OK now that’s easy’.* T15  *‘She (the therapist) even showed us one day, she was on the floor showing us what to do if there’s a fall. Well, I had no idea! Now I’m not as frightened of him falling now’*. C12  *‘I know that wasn’t the role of the physio, but R. (therapist) could have come in and we could have told her, and she might have said I’m going to look into that, I’ll find out something for you’.* C12  *‘If somebody identifies an activity such as swimming that they want to be doing as a goal, we try and facilitate the person to source that provider of that activity. Because quite often they don’t know where to start. They don’t know what community facilities there are out there’.* T57 |
| Health and cognition | Any health condition and/or type of pain that has an impact of on engagement in PrAISED. Includes dementia-related symptoms that thwart engagement in PrAISED (e.g., apathy, forgetfulness, motivation) | *‘With my balance being troublesome and my leg being troublesome, I’ve not done a lot of exercise just lately’.* P5  *‘I was wondering whether I’d give up altogether because I’ve seen three different doctors at different times, and they can’t do anything with it (pain) and it just comes and goes. Well, if it’s going to do that it’s a bit pointless isn’t it, my trying to strengthen something that comes and goes’*. P5  *‘If it’s a bad day and my leg hurts, I’m not going to do it just for the sake of doing it. But if it’s a good day I can do it’*. P5  *‘Some days I think it’s not worth getting out of bed and another day I’ll think I’ll get up and go. Just depends how, the way you feel’*. P5  *‘If it was me or you, we could think oh I need to do my exercises. But for somebody with dementia, they would never think that, and it needs prompting and prompting’*. C12  *‘I don’t know if when I arrive, she’s (participant) going to be like “R. lovely, let’s do the exercises”, and be really on the ball, or I could go in, she could be quite anxious about me being there because she needs to go and pick up the kids from school. And so that’s why I can’t plan a session’.* T58  *‘It’s really hard for those people who live on their own, the supporter is a bit of a distant person, to try and keep reminding them and working with them on, I’m coming out and making a visit and this is what we’re working on’.* T57 |
| Personal attributes and history of participants | Personal characteristics of participant that have an impact on engagement in PrAISED: e.g., interests/hobbies, personality, education, gender and gender roles, readiness for change, tenacity. Also, aspects of participant’s history that have an impact on engagement in PrAISED: e.g., reconciliating past fitness with present situation, how independent, how competitive, how organised and compliant they were | *‘I always try to put my heart and soul into it, I really do. And if I can’t do something I say oh I’ll give it a rest today and then start again tomorrow or something like that’.* P2  *‘I think every time you exercise, and you’ve got to a point, there’s always a notch to go one more’.* P7  *‘The fact that I used to swim 50 lengths every time I went and now the thought of being able to do five or six isn’t really a motivation’.* P3  *‘Having been in the Army where you’re trained and you have to act for yourself sometimes without having orders and things like that, that’s in the background, and it just gives you confidence to get on and do things.’* P15 |
| Encouraging adherence | Behaviours, attitudes and strategies for adherence to the exercises (e.g., caregivers’ encouragement, expectations of therapists) | *‘When the support worker comes, he feels he’s got something to prove. The days that she comes he’s ready to go for a walk’.* C3  *‘If I (caregiver) was doing the exercise with him (participant), he would you not feel as confident as when A. (therapist) is.’* C12  *‘Sometimes you think oh well I won’t do that today because R. (therapist) is not coming for another three weeks or something like that’.* P16  *‘P. (participant) actually writes down on his list when he’s been to the gym. And just the fact that you’re recording what you do actually is I think a hugely motivational factor’.* P15 |
| Attitude to risk-taking | Perception of risk linked to doing exercise and how this is dealt with | *‘If I feel all right and I am able to do them without the fear of falling over, then it’s a good thing. But when I’m scared I’ll fall over anyway I don’t do them’. P5*  *‘My fear of falling down is if anything worse than it was before. I mean I have had some quite bad falls. And on one occasion I became unconscious and got concussion. So having had that experience I am wary of not repeating it’. P18*  *‘I usually make sure I’ve got a chair close by, so I can put my hand there just in case. I wouldn’t do it in a room where I’ve got nothing’. P6*  *‘R. (therapist) does tell me that he doesn’t think it will be wise or safe for me to go outside the front gate on my own. Which I’m sure I have to agree, but it is imposing a sort of limit to improve as much as I would like’. P18*  *‘I’ve seen what happens when he falls, and I’ve got that awful fear. And all I think about is oh my god he’s going to fall, he’d going to fall. I think I couldn’t walk him round the block, I’d be an absolute, well I would, I’d be shaking by the time I got back’. C12*  *‘I was thinking of a lady. Her husband was very risk averse to walking her neighbour’s dog. So, you have to point out don’t you about positive risk taking, and that life is a risk sometimes and that he needed to let her make some decisions for herself’. T59* |
| Autonomous and independent decision-making | Participants’ ways of retaining a sense of autonomy and independence, therapists’ strategies to safeguard participants’ autonomy | *‘When I go and do a bit of a goal review and I say well it looks as if you’ve achieved this goal, do you want this goal amending to perhaps make it a bit harder, or shall we have a think about another goal’?* T57  *‘She (therapist) won’t just say come on let’s go for a walk; she’ll always say do you fancy a walk today? You know, so they don’t just tell you what to do, they ask me, you know, so then I say yes or no’*. P4 |
| Contextual factors | Therapist’s skills and rapport with participants | Characteristics of therapist and of rapport established with participants and caregivers: e.g., type of profession, availability of time with participant, enabler vs prescriber attitude, sex, age, fitness, allied health professional vs supporter, personality, empathy, able to understand psychology and (often suppressed) dynamics in relationships, commitment to dementia and PrAISED, experience and skills, good match between participant and therapist in terms of gender, interests, personality. | *‘I find they have more of a relationship with the support workers because they’re there all the time. It’s the support workers that they ring’.* T45  *‘The participant and the caregiver certainly value that this is being delivered by qualified professionals. I guess they attribute that you’ve got a certain specialist level of knowledge and you’ve probably got other contacts within the health system that they might benefit from accessing’.* T57  *‘She (PT) makes you feel as if you can do this, and this is a good thing to do and really gets you started and motivates you to start with’*. C3  *‘Building good relationships with the participants and with the carers, that’s a key thing. And I think a lot of it, it’s about personality, isn’t it? I think actually you could work better with certain people. And that’s just life, isn’t it’?* T59  *‘He (therapist) took me for a walk. And that was over an hour, getting on for two hours. And he didn’t say oh I’m only here for an hour, he didn’t watch his clock’*. P18  *‘It was key understanding the role of the informant a bit more, particularly for those people who live at home or those people that are in care homes*. T57  *‘I see the benefits of it but whether I will be able to sort of cajole myself into continuing without R’s (therapist) support it’s doubtful’.* P18 |
| Caregiver’s support | Caregiver characteristics, their rapport with participant and therapist, support from family/neighbours/community, burden and respite, physical health and mobility, commitment to PrAISED (or lack thereof), how much support willing/able to give, doing exercise with participant, potential benefits for caregiver | *‘I love M. dearly and I will do whatever I can to support him in the programme and to keep his independence as long as possible. That’s really important to you isn’t it, M.’?* C1  *‘I go with him because I don't think he could cope with that. But by me going with him, I chat to other people that have got similar problems. And so, in a way I quite look forward to going because rather than the little circle I've already got, I see a little bit bigger circle’.* C2  *‘In terms of that initial remembering to do them and getting it into a habit and a routine. If people are reliant on a carer for other routine daily living tasks, they’re going to be reliant on that being incorporated, aren’t they’?* P1  *‘A participant, it was his wife who said to me I can’t support my husband to engage in the programme as much as I wanted to. It’s causing me stress, too much pressure, I’m going to have to withdraw. So, it wasn’t actually the participant, but it was his wife’.* T57 |
| Therapeutic intervention | Characteristics of PrAISED that have an impact on participant engagement: e.g., difficulty – too easy, too hard, stimulating/fun, tailored activities, varied, gradual build-up of intensity, introduction of new exercises/activities vs regular/repetitive ones, clear instructions/guidance, confusion with calendar, structure vs unstructured, tapering off support, motivational strategies | *‘Sometimes I find that they’re quite difficult to do. The effort involved is more than I’m expecting’.* P3  *‘When I did the exercise, it was about seeing if I could do this. It was a bit of a challenge and that’s great’.* P15  *‘I think it’s important that you enjoy these things. That’s an incentive isn’t it to carry on’.* P15  *‘(I like) simple ones (exercises) that you can break down’.* P12  *‘I think I feel more relaxed at home, and I can get straight into it more so than going somewhere else to do it’.* P7  *‘R. (therapist) came twice a week, once a week and then once a fortnight. And then all of a sudden it was once a month. And when it went down to once a month it didn’t keep me on my toes to religiously do the exercises’.* P16 |
| Practicalities and logistics | Practical matters that have an impact on engagement in PrAISED: e.g., accessibility of home/community for physical activity, garden vs no outdoor space, stairs, urban vs rural, side streets vs main roads, mobility issues such as having to travel to venues, being a driver/non-driver, weather and seasons, individual exercise vs group exercise, leading busy lives/already doing lots of physical activity, creating time slots for PrAISED exercises for habit formation, living arrangement (e.g., living alone might be difficult to sustain engagement, initiate exercise, encouragement is lacking, safety might be at risk, no physical support either) | *‘I would think that PrAISED, for anybody who is on their own, who lives on their own, and hardly has anybody to see them - I think it would be very difficult for them to get motivated’.* P11  *‘It’s a bit easier with the people who’ve got a next of kin living with them, husband, wife, daughter, whatever. Usually all the conversations, all the therapists and RSW visits ideally the next of kin will be present’.* T57  *‘I can do my bending and my feet movement and so on. But the house is a bit small for anything more’.* P7  *‘I had to give up driving because of my eye. So, I haven’t been out so much. And that’s made a difference hasn’t it’.* P5  *‘To get T. (participant) out and about now is such hard work. If we can’t park in locally, we’ve to get the wheelchair. Then if he wants to go to the toilet that’s hard and it’s just not easy, is it’?* C12  *‘Transport perhaps can be an issue. I know RSWs have taken people swimming in their cars. And then I suppose when we come towards tapering off and maintenance it’s about looking at ways that they can maintain it without the RSW support’.* T59  *‘I cycle in the gym, but I don’t go anywhere. I find these roads quite frightening. There are so many potholes, the traffic is very big here, in the summertime lorries, tractors, great big farm implements’.* P15  *‘We actually are very poor at keeping up with that because your life is taken over by your normal routine. Our normal routine is actually quite busy’.* C15 |
| Incidents and disruptions | Unexpected events disrupting engagement in PrAISED (e.g., injuries, hospitalisations, change of therapist, inconsistent support, holidays and other life events, termination of PrAISED). Including Covid-19 pandemic and impact caused by social isolation, cancellation of community activities, impossibility to risk assess effectively, challenges in progressing participants, barriers to using technology for sessions, lack of confidence of therapists, and increased caregiver support | *‘You think A. (therapist) will be coming in a fortnight or whatever, and then suddenly you’re told well I’m sorry, I’ll not be coming for five weeks. And with the best will in the world, I don’t think many people would keep it up when they’re left on their own really’*. C12  *‘That (new medications’ side effects) altered the programme as well because we had to get over that. And I think since then you’ve sort of lost’.* C12  *‘Had J. (therapist) been able to carry on, it would have been useful to get outside the house a bit more. She (participant) is not getting outside probably enough and therefore is not walking on uneven surfaces very much, which then helps her’.* C21  *‘From Mum’s point of view, not used to using these types of technologies it’s not just like having someone sat in the armchair next to you having a chat. It’s just not what she is used to’.* C21  *‘There is not such an urge to them, it’s different. It’s voluntary and you cannot do them if you want to not do them. Somebody coming round to knock on the door to take you through them, you just do it’.* P25  *‘It might be that she (therapist) is phoning, and Mum isn’t saying and sometimes Mum does have phone calls from people and chat to them and not really be fully aware who she is speaking to’*. C21  *‘I think I would prefer her to come because I think when she was here, I could go into another room if necessary and do a job or two’*. C28  *‘I must point out at this stage that I do them all with him, I don’t just stand there and watch. We do them together to motivate him and say, come on, let’s do this, let’s do the other, look, I’m doing it, you can do it’.* C26  *‘I think it (remote support) is brilliant, absolutely brilliant. I cannot fault it, it’s not the same as having a face-to-face talk but I can see her, we can talk’.* P31 |