I am a Senior Lecturer in Psychology at Abertay University Dundee with a PhD in Cognitive Neuroscience. I am also trained in dance teaching and choreography (www.CoCoDanse.com). It thus comes as no surprise that my research - as well as my focus here - is on the effects of dance practice and dance spectatorship.

**Dance is a special form of physical activity** and a recognition of its benefits is vital. Thus, this personal response focusses on dance and is in addition to my participation in two other submissions, which are Abertay Health and Sport and Culture Counts. Dance has recently gained immense attention in science; and in the public domain, dance is now more widely recognised as excellent means to keep physically fit, feel connected and thus enjoy a more happy life. Hence, dance is a package of physical activity with other benefits, which arguably increase participation. Hence, dance seems ideally suited for social prescribing.

I therefore first highlight existing evidence for the benefits of dance (with the cited references at the end of the document), before I provide my responses to the set of questions. Whilst my experience in dance-based interventions undeniably influenced my responses, it is important to note that they are prevalent also in other types of physical activity and sport.

**A case for Dance-based Interventions**

Dance-based interventions are an effective way to improve the physical, mental and social health and well-being of individuals. Supporting evidence for the benefits of dance exists for numerous health conditions, such as managing cancer treatments, Parkinson’s, mental health issues, dementia, fibromyalgia, or obesity - to name just a few. A recent meta-analysis showed that overall; dance movement therapy and dance interventions decrease depression and anxiety, increase motor skills, enhance the quality of life as well as improve interpersonal and cognitive skills. In my own research with colleagues, we found that experience in dance is linked with higher levels of proprioception (i.e., sense of body limbs in space), which means that the interaction with the environment seem to be facilitated through dance practice. Dance training also involves mental imagery processes that are crucial for motor learning and individuals’ confidence, which we found to be the case in a training that improved stroke patients’ motor coordination and self-esteem. In addition, dance does engage areas of the brain that are involved in language comprehension. It is thus important to acknowledge that in addition to physical improvements, dance shares some of the benefits with other creative interventions, such as emotional expression, motor coordination and communication. This is because dance does not focus on solely the physical activity component. Moreover, dance intervention studies show high retention rates: in one study, almost half of the participants continued to dance after the intervention, whereas none of the participants in the conventional physical based activity group did.
Moreover, in another case, the retention increased during the study and the participants even expanded their general physical activity levels\textsuperscript{13}. 

The transformative power of dance can be explained as a result of its multifactorial nature, in particular the social as well as emotional facets which act in addition to the physical elements. For example, dance provides a platform for social interaction through its coordination with the other dancers and together with moments of touch, leads to decrease in pain thresholds and a sense of social closeness\textsuperscript{14}, which is an important part of any healing process and helps to be able to cope with the effects of an illness. On the emotional side, dance like other art interventions allow participating individuals to explore their feelings and express them in various ways, which for example opens opportunities to deal with traumatic experiences\textsuperscript{15}. 

Considering the multitude of positive effects dance can have for a number of health issues – even when just passively watching dance\textsuperscript{16,17} – dance seems ideally suited as an intervention to be used for social prescribing. However, albeit there are increasing numbers of studies that looked at the benefits of dance and dance therapy for health interventions, most studies are based on a small number of participants’ and there is hardly any common denominator across these, making it challenging to identify strong, statistically powerful effects. This needs to be addressed strategically; as considering the immense healing potential dance has as well as its fundamental role in well-functioning societies since over 40'000 years, we could benefit from and learn more about the underlying processes of human health and wellbeing through dance interventions. Yet because there are many different styles of dance, each with its own characteristics, it is a challenge to make specific health predictions. Add to the mix that there are clearly individual preferences for different styles of dance\textsuperscript{18}. 

To conclude, for an optimal use social prescribing, the focus should be on activities that are multifaceted, such as dance. Then, in order to allow better predictions on the effects the interventions have for specific health issues, recognising the need for more empirical research is necessary. Not only are more and more sustained resources needed for community interventions that promote physical, mental and social health, a better network between practitioners, doctors, and scientists will allow to make further progress. The best use of the costs of social prescribing and advancing our understanding of what should be prescribed and when should go hand in hand. For this, we need guidelines for a strong link between solid research and excellent practice by means of the creation and support for a long-term research-strong practice-based intervention network. 

\textbf{1. To what extent does social prescribing for physical activity and sport increase sustained participation in physical activity and sport for health and wellbeing?}

Interventions, such as dance, that do not solely focus on a motor component have been observed to increase sustained participation. For example, in one dance intervention study, almost half of the participants continued to dance after the intervention, whereas none of...
the participants in the conventional physical based activity group did not increase retention. Moreover, in another case, the retention increased during the study and the participants even expanded their general physical activity levels. It was also reported, that participants in the control group, started dancing in response to the study! Based on the current experiences, in order to be effective in the long-term, the social prescribing needs to focus on activities that are not just physical.

2. Who should decide whether a social prescription for physical activity is the most appropriate intervention, based on what criteria? (e.g. GP, other health professional, direct referral from Community Link Worker or self-referral)

At present, not one individual body is in a good position to decide what the most appropriate intervention is. In order to allow better predictions on the effects specific interventions have for particular health issues, more empirical research is necessary. A better network between practitioners, scientists (which includes Psychologists), GPs and health community links would enable faster progress on our understanding of the benefits of different interventions for different health issues. Such a network would provide the best use of the investment into social prescribing as it would not only act on the present, but provide a insights into the mechanisms which can be shared internationally. Such a network will undoubtedly advance our understanding of what should be prescribed, when, for how long, and at which intensity; which is urgently needed. For example, psychological factors influence whether individuals follow up on the prescription and which style of practice best suits them. In particular, the latter was shown in very recent studies. Hence, a network involving key persons from multiple disciplines would allow sharing up-to-date knowledge and experience for best practice.

In other words, funding is required that go towards the creation, the continuation, the theory-driven investigations, and the development of knowledge exchange (e-)tools, CPDs, as well as third party evaluation and monitoring. This can only happen by means of aligning funding to requirements for a research-strong practice-based intervention network, which is based on a community of experts. At present, the need for more scientific and theory-driven empirical research is unavoidable in order to allow better predictions and identification on what is the most appropriate intervention.

3. What are the barriers to effective social prescribing to sport and physical activity and how are they being overcome?

My answer to this question does not focus on potential individual barriers; but on barriers that hinder the progress of our understanding of human behaviour and cognition in health and wellbeing and thus impinge on the advancement of future projects (and/or prescriptions).

The funding is often time-limited, which does not allow building sustainable interventions or enhancing existing programmes and prevents the building of a cross-sector network. Moreover, once time-limited funding has been gained, often, the research aligned with the project focusses on providing evidence for the benefits of the intervention.
makes sense from a funding-sustainability point of view; however, in order to provide
effective social prescription it is detrimental in the long-term. This type of supporting
evidence does not provide substantial in-depth information needed for future targeted
recommendations, since it does not investigate the underlying factors of human health or
behaviour. It is important that social prescribing is part of a network that involves
practitioners, third-party scientists, GPs, and community link workers made possible in a
transparent approach.

4. How should social prescribing for physical activity and sport initiatives be
monitored and evaluated?
Funding for social prescription should follow clear networking guidelines set out by the
funding providers. These guidelines should be based on principles of openness and
transparency. Each project needs to include and should allow access to unbiased
independent third parties for evaluation. Key experts (i.e., practitioners,
scientists/researchers) should be able to get information on which projects are running
where and who the key contacts are. Moreover, the aim of each programme should be the
continuous development of standards of best practice. Cross-project monitoring would
further allow increasing the positive effects for the community of practitioners. A network
basis should be created, which is able to link practitioners, GPs, scientists, and Community
Link workers transparently for evaluation, monitoring, knowledge transfer and data sharing.
Through such a network-basis, information can be shared with the aim to advance
understanding, allow making better predictions and prevent errors of expectations.

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