

## Using the COM-B model to identify barriers and facilitators of long-term participation in a dance programme to increase physical activity in older adults

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### ABSTRACT

'Dance On' is a community-based dance programme designed to engage older adults, especially females, and those of a low socioeconomic status, in regular physical activity. Data showed those that those who engage with 'Dance On' report a sustained increased in physical activity and wellbeing over 12 months. In this study we aim to explore older adults' perspectives on factors that help or hinder continued engagement with 'Dance On' in relation to both the Capability, Opportunity, Motivation and Behaviour (COM-B) model and the Theoretical Domains Framework (TDF). Semi-structured interviews with 18 older people who had participated in 'Dance On' for more than 12 months were conducted. Data analysis involved deductive thematic analysis using the COM-B to identify overarching behavioural influences, and then the domains of the TDF were mapped onto the elements of the COM-B to permit a more detailed examination of the psychological, social, and environmental factors underpinning behaviour. Eleven of the 14 TDF domains, mapped onto the COM-B domains. Environmental context and resource, especially location and cost and social influences, including social support and the inclusive nature of the sessions were particularly important to sustain. The leadership of the dance classes was also seen as a key factor in sustained participation. Three of the TDF were not mentioned by participants including knowledge, optimism and behavioural regulation. Sustained adherence to community-based programmes like 'Dance On' can be meaningfully supported by the Behaviour Change Wheel (BCW) that draws upon both the COM-B and TDF.

Due to an increase in life expectancy and a decrease in fertility, the global population is aging. The percentage of the world's population aged over 60 is forecast to almost double to 22% by 2050 (World Health Organisation, 2024). In England, the number of people aged 65 and over has increased by 52% over the last four decades; with 18% of the country's population now aged 65 or older (Centre for Ageing Centre for Ageing Better, 2023). Many older adults live with a range of non-communicable diseases, which place a huge burden on healthcare systems such as the UK National Health Service (Prince et al., 2015). Engaging in regular physical activity is one of the most effective ways to reduce the risk of developing these conditions, and manage their associated symptoms (Ascherio & Schwarzschild, 2016; Bhalsing et al., 2018; Colberg et al., 2010; Kirwan et al., 2017; Lauzé et al., 2016; Liang et al., 2022). In addition, staying active is crucial for maintaining health, mobility, and the ability to live independently (Manini & Pahor, 2009). Despite these benefits, global figures show physical activity declines

with increasing age, with 43.5% of older adults aged 60 years and over not meeting recommended levels of physical activity of 150–300 min of moderate-intensity aerobic activity or 75–100 min of vigorous-intensity aerobic activity per-week (Strain et al., 2024).

In the UK more than a third of people aged 55–74, and over half of those aged 75 or older fail to achieve the recommended levels of physical activity (Sport England, 2024). While the most recent data from Sport England's 2023-2024 Active Lives Survey (Sport England, 2024) showed that there has been an increase in physical activity by older adults, women remain less active than men, a disparity which has been consistently reported in the literature (e.g. Guthold et al., 2018). This same data also showed that older adults of a lower socioeconomic status (SES) exhibit lower physical activity levels. Together this showed that older adults from lower SES groups, and particularly females, represent a key target for public health interventions aimed at increasing physical activity (Harris et al., 2024).

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While exercise programmes, at least initially, increase physical activity in older adults (Chase, 2015), ensuring adherence to these programmes long term is more difficult (Hertogh et al., 2010; McAuley et al., 2007). This poses an important public health challenge (Bauman et al., 2016), as previous evidence showed that the benefits of physical activity depend on regular and sustained participation, and that long-term biological adaptations gained through regular exercise classes can diminish within weeks of inactivity (Chodzko-Zajko et al., 2009). Promoting exercise adherence in older adults requires a multifaceted approach that considers systemic and individual factors (Izquierdo et al., 2025). For example, Franco et al.'s (2015) systematic review revealed that while some older people believe in the potential of physical activity to improve physical and mental well-being, there are key barriers to participating in physical activity. These include lack of social support, previous sedentary habits, accessibility, competing priorities and perceived frailty. Research has also revealed that older women have different motivations for physical activity than older men. Unlike younger adults or men, older women often prioritise emotional and social benefits over competitive or performance goals, and researchers conclude that other motivations encompass enhancing physical health, independence, mental wellbeing, social connection, enjoyment, and identity maintenance (Phoenix & Grant, 2009; Franco et al., 2015). Understanding these motivations is an important part of designing effective, engaging, and sustainable physical activity programmes tailored to older people's needs.

Community-based activity programmes have long provided accessible and supportive environments that encourage older adults to stay active (Farrance et al., 2016). Exploring people's experiences of taking part in these programmes is essential to identify what strategies successfully promote long-term participation and behaviour change. However, while there is a growing body of evidence on what motivates people, and more specifically older adults, to start exercising in community settings (Meredith et al., 2023), more research is needed to identify which aspects of programmes have a strong influence on adherence, particularly in a real world context which have been successful in maintaining participant adherence over an extended period of time (Farrance et al., 2016). This gap in the research makes it difficult to design programmes that effectively support sustained physical activity in older adults and attract long-term funding.

The 'Dance On' programme is one example of a community-based initiative (Britten et al., 2017). 'Dance On' has been running since 2018 across Yorkshire, and in areas of high health inequalities or low SES. Initially three focus groups with older adults allowed participants to experience a dance session and provide feedback on its appeal, potential modifications, and overall acceptability. This input, together with guidance from a broader advisory group including dance artists, informed practical programme decisions such as session frequency, scheduling, venue selection, and outcome measures. Quantitative evaluations of "Dance On" that have operationalised adherence using programme attendance records, report 'high adherence (71% over 12 months) to the programme. Furthermore, results concluded the 'Dance On' yielded a significant increase in physical activity levels in older adults from baseline to 3 months of attendance, which was sustained over a 12-month period (Britten et al., 2017). In addition, when 'Dance On' moved online, due to COVID restrictions, the adherence rate was maintained, and mental well-being improved (Pina et al., 2024). Indeed, 'Dance On' still runs today across Yorkshire and has been funded through various sources for ~7 years. Given the high level of adherence in addition to the positive effect it had on improving and maintaining physical activity levels, in a predominantly female sample (83%) it is important to understand which factors of the programme influence adherence.

Behaviour change models are crucial in encouraging and understanding the factors that influence physical activity behaviour in older adults (Izquierdo et al., 2025; Meredith et al., 2023). One widely used system of behaviour change is the Capability, Opportunity, Motivation

and Behaviour (COM-B) model, developed through exceptionally comprehensive coverage of 19 theories (Michie et al., 2011). The COM-B model provides a framework for examining how behaviour change occurs, proposing that changes in an individual's capability (whether someone has the physical ability, skills, and knowledge needed to carry out a behaviour), opportunity (external factors that make the behaviour possible), and/or motivation (automatic processes, like habits and emotions, and reflective processes, such as conscious decision-making and intentions) are essential for initiating and sustaining behaviour (Michie et al., 2011). The Theoretical Domains Framework (TDF) comprises 14 domains that can be mapped to the 3 main components of the COM-B model, with each domain representing a cluster of psychological or contextual factors that influence behaviour. Thus, when combined with the TDF, the COM-B model allows for a more detailed analysis of the barriers, facilitators, and mechanisms of change that influence behaviour (Atkins et al., 2017).

Complex interventions, such as community-based physical activity programmes like 'Dance On', involve multiple interacting components and behaviours that require detailed behavioural understanding to be effective and sustainable (Skivington et al., 2021). While behaviour change frameworks are frequently used to identify determinants of engagement, their capacity to explain long-term participation in complex, community-based movement contexts remain under-examined. Thus, applying frameworks such as the COM-B and TDF to the 'Dance On' programme provides an opportunity not only to identify factors associated with sustained engagement, but also to critically examine the adequacy of these individual-level models for capturing relational, identity-based, and affective processes that may underpin maintenance over time (Michie et al., 2011; Atkins et al., 2017).

By using COM-B/TDF as analytic lenses rather than purely confirmatory tools, this study sought to inform understanding of what works, for whom, and why, while also highlighting potential limits of existing frameworks when applied to long-term adherence (Skivington et al., 2021). This approach supports more theoretically informed use of limited public resources by identifying both popular and accessible interventions, but also where behavioural frameworks align with or fall short of participants' lived experience of sustained participation. In turn this can inform the development of targeted strategies to enhance participation among underrepresented or at-risk groups, increasing equity and reach (Keyworth et al., 2020) and providing direction for improved intervention strategies using a systematic approach to help inform and update policy and practice within the area of PA, exercise, ageing and health (Meredith et al., 2023).

This study aims to explore older adults' perspectives on physical activity behaviour change by investigating the psychological, physical, social and relational factors influencing sustained engagement in the 'Dance On' community-based dance programme, following at least 12 months of participation. Using semi-structured interviews and guided by the COM-B model and TDF, this research seeks to elucidate if and how well these frameworks account for participants' experiences of long-term adherence, identifying the capabilities, opportunities, and motivations associated with continued engagement, as well as aspects of sustained participation that extend beyond existing behavioural domains, to inform future community-based physical activity interventions.

## 1. Methods

### 1.1. Philosophical stance

This study is grounded in an interpretivist philosophical position, which prioritises understanding the meanings and experiences that older people attending 'Dance On' attribute to their continued participation. Our subjective epistemology recognises that knowledge emerges through dialogue and interaction between the researcher and participant, and from a relativist ontology, we assume that reality is socially

constructed (Poucher et al., 2019). As reflexive researcher practitioners, we acknowledge our roles in co-constructing meaning through semi-structured interviews and the interpretive process (Sparkes & Smith, 2014). The analysis was primarily deductive, combining semantic and latent coding, and was informed by both the content of the data and established theoretical frameworks. The research team brought diverse disciplinary backgrounds that shaped the research process and interpretation. XX, a researcher with a PhD in motor control and academic lead on the 'Dance On' project, has a longstanding interest in how movement is initiated and maintained in older people. xx, with a PhD in exercise psychology, specialises in behaviour change and physical activity. xxx, with a Master's in sport physiology, and xx with a PhD in physical activity in marginalised communities, worked as research assistant and post-doctoral research assistant respectively on research projects related to the original 'Dance On' project, thus while this brought familiarity with its delivery and impact, they were not involved in the design, implementation, or evaluation of the initial programme. We acknowledge that these perspectives influenced how we engaged with the data.

Collectively, the team's differing levels of involvement with 'Dance On' ranging from long-term leadership to no prior involvement, to engagement in related but distinct work provided a mix of insider and outsider positionalities. This diversity supported reflexive dialogue, analytic sensitivity, and critical interrogation of interpretations, and helped to reduce, though not fully eliminate, the potential for social desirability bias and confirmatory interpretation.

To enrich and structure the interpretation of participants' accounts, we mapped qualitative data onto the COM-B model and the Theoretical Domains Framework (TDF). This decision reflects a pragmatic layer within our interpretivist orientation, aiming to bridge participants' lived experiences with established behavioural theory. While COM-B and TDF originate from a more positivist and behaviourist tradition, we attempt to employ them not as rigid coding tools, but as analytic lenses to help surface patterns across individual narratives.

We recognise that translating rich, relational, and affective accounts of participation into behavioural framework language involves a degree of analytic reduction and may risk flattening experiential meanings. To address this, mapping was conducted reflexively and iteratively, with attention to context, ambiguity, and contradiction within participants' accounts. The analysis was led by the data, with COM-B and TDF domains used to interrogate, rather than determine, interpretations of potential drivers and barriers to sustained participation in the 'Dance On' programme.

### 1.2. Participants and recruitment

A purposive sampling approach was used to identify older people who had sustained participation in 'Dance On', defined for the purposes of this study as continued attendance for a minimum of 12 months, based on programme enrolment records rather than fixed attendance thresholds. Our delivery partners facilitated recruitment. While more information on eligibility for participation and the delivery of the programme has been published previously (Britten et al., 2017), to attend 'Dance On' participants must be 55+ years of age, and while the initial programme was designed for females, and attendance is predominantly females (83%), males can also attend 'Dance On'. Recruitment stopped when data saturation was reached. The final sample included 18 participants, 14 who identified as female and 4 as male. While no further demographic data were collected to prioritise participants' lived experiences and maintain a focus on behavioural influences rather than individual characteristics; the demographic data of all participants involved in 'Dance On' can be found in Britten et al., 2017 and this provides some context. Ethical approval was obtained from the University of xxxxx Research Ethics Committee (xx xxx-21-025), and all participants gave informed consent prior to taking part.

### 1.3. Procedure and setting

A semi structured interview guide with open ended questions was designed by authors SA and IP to address the research aims. To ensure a range of factors could be explored that may have contributed to continued attendance at 'Dance On', interview questions were guided by the COM-B model (Michie et al., 2011), with 2-3 questions developed per domain and other additional prompts supported by the TD. The interview guide was piloted with three older adults who were not included in the main study sample. The pilot aimed to assess clarity, relevance, and flow, and feedback from these interviews informed minor refinements to question wording and ordering to optimise comprehension and elicit rich, detailed responses. The semi structured interview guide provided structure but was flexible enough to allow participants to discuss what mattered most to them in relation to long-lasting attendance at 'Dance On' sessions. The guide consisted of (1) rapport building questions, and purpose of the interview e.g. *Can you tell me a bit about yourself and how you first got involved in this dance programme?* (2) initial experiences and enablers of continued participation e.g. *What do you think makes it easy or easier for you to continue taking part in Dance On classes?* (3) barriers to continued participation e.g. *are there aspects of the environment or group that support you to be and remain active?* (4) Perceived impact of long-term participation e.g. *what do you think are the advantages of being involved in Dance On for a long time?* (5) concluding questions where participants could share any additional information. All interviews were conducted by one researcher (IP) either online via Zoom or via phone call, depending on the preferences and availability of participants. Each interview lasted between 17- and 35-min ( $M = 25.51$ ) and were conducted between September 2022 and January 2023.

### 1.4. Data analysis

All interviews were transcribed verbatim by a member of the research team (IP). To ensure transcription accuracy, each transcript was reviewed by at least one other team member who listened to the audio recording while reading the transcript, checking for errors, omissions, and unclear phrasing. Minor corrections were made as needed, and any uncertainties were resolved through team discussion. Each participant was assigned a unique code, and any identifying information was removed to maintain privacy and anonymity. Data were analysed using deductive thematic analysis, guided by the COM-B model and the TDF. We used a deductive thematic mapping approach to compare findings against these established frameworks: the COM-B model (Capability, Opportunity, Motivation–Behaviour) (Michie et al., 2011) and the TDF (Crane et al., 2012). Microsoft Excel was used to organise themes systematically, while Padlet was used to support collaborative visualisation and mapping of the data. The COM-B model was used to identify overarching behavioural influences, while the TDF enabled a more detailed examination of the psychological, social, and environmental factors underpinning behaviour. The first author (IP) familiarised themselves with the transcripts, noting initial features and potential points of analytic interest. Coding was conducted deductively, to identify a priori objectives using the COM-B components and TDF domains. These were also reviewed and analysed by a second researcher (XX), who also reviewed the representative quotes selected by XX for each COM-B component. Following this, two researchers (XXX and XX) independently mapped participant responses to the TDF components to enhance rigour and reliability. Any discrepancies were discussed and resolved through arbitration by a third researcher (XX). This process resulted in an interrater agreement of 88.9% between XXX and XX, supporting consistency in the application of the TDF.

## 2. Results

### 2.1. Facilitators and barriers to adherence to the 'Dance On' Programme

As illustrated in Fig. 1, 11 of the 14 domains of the TDF were reported as influencing participants continued participation in the 'Dance On' Program. Two domains appeared to be particularly important: environmental context and resources and social influences. Interestingly, three domains of the TDF were not mentioned by participants including knowledge, optimism and behavioural regulation. The findings are organised into the three primary components of the model: Capability, Opportunity, and Motivation, each with their respective TDF subdomains.

### 2.2. Capability: physical and psychological

Within the capability system of the COM-B, two TDF domains (physical skills and memory, attention and decision making) were described by participants as influencing their continued participation in the 'Dance On' program. Within physical capability component of the COM-B, the skills domain of the TDF was described by participants as impacting their adherence to the 'Dance On' programme. Participants expressed a noticeable improvement in their physical capability during sessions and how their skills are a barrier to adhering to alternative forms of physical activity (i.e. attending the gym). For example, one participant shared, "you're taught how to exercise your body suitably without hurting yourself. Like for instance, I wouldn't go to a gym 'cause I wouldn't be able to do much".

Participants frequently described how the dance sessions supported them in maintaining or improving their physical function, particularly after illness or periods of inactivity. One participant noted, "After an illness but going to class it's made me begin to move everywhere again", while another shared, "It loosened me up and the next morning I felt ... I could do things a bit more easier". These experiences suggest that regular

participation encouraged gentle re-engagement with movement in a way that felt manageable and beneficial.

Within psychological capabilities and specifically, the memory, attention and decision domain of the TDF, participants describe how the classes and activities were structured to support learning and memory of the dances and using decision processes to sustain interest in the dance, with one participant highlighting this process in the dance classes, "OK so she passes it from one to the other and we have to lead the class then OK? OK, and do the whatever movement we choose, OK? It isn't copying her at that point, it's doing our move OK and getting the class to do it. OK, so that's also a very good way of keeping our interest going, and you have to think a bit about it".

Participants also described the sessions as cognitively accessible and supportive, helping them learn and retain movements without feeling overwhelmed. The teaching was often broken into manageable steps, with one participant noting, "We just learned one dance ... taught it in little easy sections ... and at the end of an hour he was able to do the whole thing in one go". Others highlighted how instructors adapted to different learning needs: "She remembers all our main elements ... just taking it very slowly. So it's very holistic," and "If we can't do the dance ... she really considers all our ability".

### 2.3. Opportunity: physical and social

Participants identified and highlighted numerous social and organisational components that enabled their continued participation. Factors related to physical opportunity and social influences were the most reported TDF domains in this study. Specific to physical opportunity, the environmental context and resources were extremely important for participation. The location of the sessions was important, particularly for those without access to a car: "The location is very important, I don't drive - I need somewhere I can get to by bus or walk". The space itself was frequently described as pleasant and well-equipped: "It's nice and light and airy ... we've got a nice wooden floor and comfortable chairs", and "The

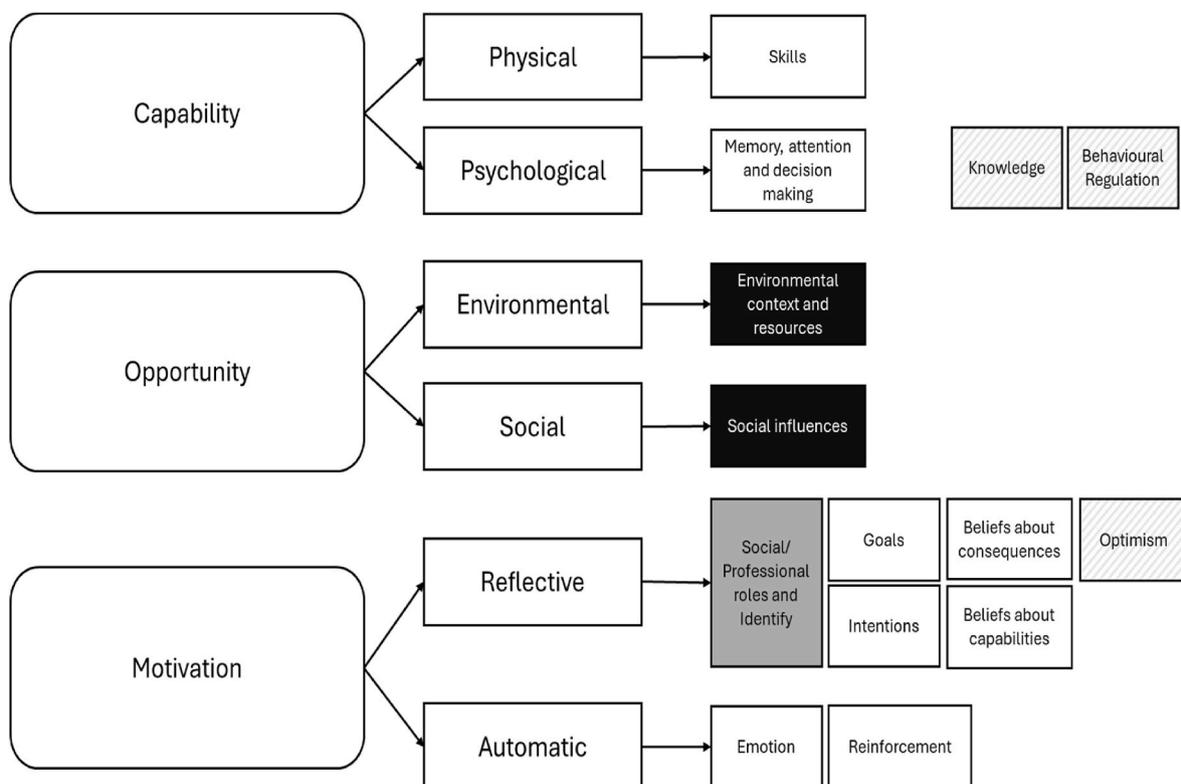


Fig. 1. Matrix the COM-B and TDF domains found in this study. Black boxes represent the most frequently described TDF domains, and grey box is the second third most frequently described TDF domain. Light grey patterned boxes represent TDF domains that were not described by our participants.

*studio is always clean, air-conditioned, and they supply water in case you forget your own”.*

In lower SES areas affordability is crucial to sustained participation and was a key factor in accessibility in this study, with several participants highlighting the low cost: *“You can just pay £3 a week ... where could you possibly go to have a nice time for that?”*. Importantly, participants valued the sessions being age-appropriate and non-intimidating. One explained, *“You want to do exercise suitable for your age – so that dance and everything is tailored around the older person”*, while another added, *“It’s a lovely form of exercise where you don’t really feel as if you’re being put through your paces like you would at the gym”*. The sense of comfort and safety was echoed by a participant who said, *“You’re always giving an easier option”*. and *“some ladies who have had problems with safe balance will use a chair as it stands behind them or fix on it”*. Overall, the sessions offered a supportive space for older adults to stay active in ways that felt both enjoyable and achievable.

Participants frequently spoke about the strong social aspect of the dance sessions, highlighting the importance of social support in adherence to ‘Dance On’. Participants described the dance classes as a welcoming space to meet others and build new friendships. Many valued the routine of seeing familiar faces each week, with one person sharing, *“I look forward to each week ... meeting up with the other ladies and having a general chit-chat. Afterwards we just go for a cup of tea”*. For some people, especially those new to the area or living alone, the sessions provided opportunities for meaningful connection: *“We moved here six years ago, so I wanted to go somewhere I could meet people”* and *“When you’re on your own, there’s nothing better”*.

The group atmosphere was described as non-competitive and supportive, where *“nobody is trying to outshine anybody else”*. The inclusive nature of the sessions was seen as central to their long-lasting success. New participants were made to feel welcome, with one noting, *“If somebody new starts, they’re made to feel welcome,”* and another adding, *“They try to learn your name”*. Informal social support extended beyond the sessions too, with participants describing how *“some people give lifts to one another”*, and *“if you’re not well ... they will say, are you alright, do you need anything?”*. Together, these social and environmental conditions created a supportive and practical setting that encouraged regular participation.

#### 2.4. Motivation: reflective and automatic

The majority of TDF domains that are encompassed by reflective motivation construct of the COM-B were mentioned by participants, except for optimism. Most frequently mentioned were social/professional roles and identity, beliefs about capabilities and beliefs about consequences. For social/professional role and identity, the leadership of the classes by dance trainer was important for participants. *“I think the teacher is very important because like I said, it’s their enthusiasm as well that follows that you know that that everybody can feel, I think anyway, but I’ve noticed that a lot of them also ask for your opinion as well”*. Another participant agreed saying that *“I think in many ways it is the teacher to be honest as well as anything else, but I think it’s listening to how it is, how your class responds to you”*.

A key aspect of the session was the absence of pressure and the presence of gentle encouragement, which helped build confidence over time. One participant shared, *“Make sure that everybody knows there’s no pressure ... to perform in a certain way”*, while another said, *“If you don’t want to join in you can just sit and watch ... then maybe another week you come”*. Dance artists were also praised for helping people who were struggling: *“They sort of symbolise it so that everybody feels as though they’re getting something out of it”*. For many, being treated with respect and encouragement by the artists leading the session also reinforced their motivation: *“We’re not treated like old people”*, and *“If someone says, ‘You’re doing that really well,’ then you think, I’ll try something else now”*. Even for those less motivated, the positive and understanding environment made it easier to stay engaged.

Balance and coordination were key areas of improvement for many, reflecting beliefs about their capability’s domain of the TDF. One participant said, *“I’ve been told by my physio that my balance is not completely good, and having rhythm and using balance helps,”* while another observed, *“Some ladies who have had problems with safe balance will use a chair ... it’s there if you need it”*. The sessions were praised for accommodating different needs, with one person highlighting *“You’re always given an easier option, so you can either do the easy one or stretch yourself a bit and do the harder”*.

Participants also described anticipated regret and social and physical consequences of not participating to positively influence motivation. For example, one participant reflected on how imagining how non-attendance shaped their ongoing engagement with the programme noting that *“my motivation is because if I if I don’t keep going and I will be such a stuck now little bungalow with no outlook and and I would lose my friends and I would lose the ability to get out there and dance so my motivation is to get up, get out there even if you’re not feeling as good as you should do”*. This account also illustrates how reflective motivation, anticipated regret, and social identity are closely intertwined in participants’ narratives, rather than operating as discrete processes. Reflective motivation also came through in how participants viewed the sessions as a way to maintain social connections, mental stimulation, sense of identity and leadership. One noted, *“If I don’t keep going, I’ll be stuck in a little bungalow with no outlook”*, while another remarked, *“You have to fight when you start to get too comfortable with your own company”*. There was also a strong sense of purpose tied to physical health and independence, often underpinned by a determination and intentions to stay active as people aged. One participant reported: *“The most important thing for me is you’re doing something to keep fit”* while another said, *“I’m not fighting getting old ... but I don’t want to feel like this is the beginning of the end after I’ve turned 70”*. Others mentioned pushing through physical discomfort or fatigue to attend: *“I’d rather take two paracetamol, I’m determined to go”*.

Both reinforcement and emotion domains of TDF were described within the automatic motivation component of the COM-B system. Participants expressed emotions of love and enjoyment for the sessions and the ability to freely express themselves. For example, one participant noted, *“Whatever’s going on in in the real world and for me it’s a place where I can really enjoy, and in every aspect there’s joy”*. Participants frequently spoke about the sense of enjoyment and emotional uplift they experienced through dance, which played a strong role in keeping them motivated. Many described how music, movement and body expression provided a positive contrast to daily routines. One participant said, *“It starts the week well ... if you’ve had a grey weekend, it’s something to get you going and moving”*, while another shared, *“I love the interaction with music ... the only language needed for dance is enthusiasm and imagination”*. For some, the sessions helped bring structure to retirement: *“I want some structure ... I enjoy this. I’m committed to this”* This routine, paired with the welcoming and varied content of the sessions, helped people stay engaged: *“She keeps the enthusiasm going because she varies the programme”*. Dance was seen as an enjoyable yet meaningful form of exercise and movement: *“You don’t realise how many muscles you use ... it’s so enjoyable and I just feel I’ve had a really good workout”*. Overall, both emotional enjoyment and a clear sense of personal value helped sustain participants’ motivation to attend and continue attending ‘Dance On’ sessions.

### 3. Discussion

This study applied the COM-B and the TDF to explore participants’ perspectives on factors that influenced sustained (>12m) engagement in a community-based dance programme designed to increase physical activity in predominantly female, older (55 yrs+) adults in low socio-economic areas of the Yorkshire, UK. We found that 11 of the 14 domains of the TDF were reported as influencing participants’ continued participation in the ‘Dance On’ Programme. Two domains appeared to be particularly important; environmental context and resources and

social influences, while three domains; knowledge, optimism and behavioural regulation were not noted. This study helps address a critical gap in the literature regarding long-term adherence to physical activity programmes among older adults, particularly females and contributes to the design of sustainable and scalable interventions (Farrance et al., 2016; Meredith et al., 2023).

Participants consistently spoke about improvements in physical functioning. For many, the dance sessions not only helped to maintain or regain physical capabilities after illness or periods of inactivity but also offered a manageable and less intimidating alternative to conventional exercise environments like gyms. This aligns with prior research, including our own (Britten et al., 2017; Britten et al., 2017), which emphasised interventions tailored to the needs and preferences of older adults through inclusive, age-appropriate instruction, avoiding overly clinical interventions based around health messaging or performance-driven settings, are more likely to be perceived as welcoming and sustainable and thus more likely to support long-term adherence (Franco et al., 2015; Phoenix & Grant, 2009). These findings align with Harris et al. (2024), who highlight those interventions perceived as fun, flexible, and low-pressure are more acceptable and effective among older adults with lower socioeconomic status (SES), especially when tailored to their functional and psychological needs.

The structure and delivery of the sessions also played a critical role in sustaining engagement. Participants valued the way instructors tailored content to different abilities and broke down routines into manageable parts. This approach ensures the sessions were mentally stimulating without being overwhelming reflecting the nature of the sessions which are didactic and creative, while providing opportunities for cognitive engagement (Britten et al., 2017). Importantly, as there is no need for participants to remember steps or routines as is seen in more traditional forms of dance e.g. ballet or tango, the dance activities are mentally engaging and cognitively accessible for all, and other work suggest older adults can adhere easier to this type of physical activity (Meredith et al., 2023).

Social connection was central to participants' ongoing involvement. The classes created a warm, welcoming atmosphere where participants could form friendships, connect with others, and enjoy shared routines and rituals such as post-session tea or informal check-ins. For many, particularly those living alone or recently relocated or bereaved, the social component of 'Dance On' provided essential emotional support and a sense of belonging. Previous studies have shown that social support is a key determinant of exercise adherence in later life (Farrance et al., 2016); particularly in older adults from lower SES backgrounds (Harris et al., 2024) who are more likely to remain engaged when programmes are group-based and foster peer bonding and trust. Overall, our findings indicate the idea that strong peer networks and inclusive group dynamics facilitated by dancers and artists encourage long-term engagement.

Both logistical and financial accessibility was another critical facilitator for continued attendance in 'Dance On'. Participants noted the importance of having a venue they could reach easily, either by foot or public transport, and appreciated the low cost of attending sessions. This reflects concerns identified in the literature about physical activity inequality, particularly among women and those in lower socioeconomic groups (Harris et al., 2024; Sport England, 2024) and these factors have been reported as those affecting physical activity participation in a recent systematic review (Madigan et al., 2024). By designing and intervention that addresses common barriers such as affordability, access, and age-appropriate programming, 'Dance On' succeeded in reaching and retaining populations that are often underrepresented in structured physical activity programmes.

Participants spoke about the intrinsic enjoyment of dancing and the emotional uplift they felt during and after sessions. Many found that music, rhythm, and expressive movement helped reduce stress and bring meaning to their routines, with dance becoming a valued part of their weekly structure. The sense of progress and achievement, possibly by

simply attending regularly, given the high adherence to the programme previously reported (Britten et al., 2017) contributed to a growing sense of competence and self-efficacy. These experiences are consistent with evidence that older women often prioritise emotional well-being, identity maintenance, and enjoyment when engaging in physical activity (Phoenix & Grant, 2009).

Importantly, the leadership and interpersonal style of the instructors appeared to shape the overall experience significantly. Participants described how instructors' enthusiasm, respect, and attentiveness helped build trust and motivation. This relational aspect echoes the idea that the quality of the instructor-participant relationship can be just as important as programme content when it comes to long-term adherence (Bauman et al., 2012; Farrance et al., 2016).

Taken together, these findings demonstrate that long-term participation in community-based physical activity is best supported by programmes that combine functional benefits with social connection, emotional engagement, and accessible delivery. This reflects previous calls for physical activity interventions to move beyond one-size-fits-all exercise prescriptions and instead embed movement in culturally meaningful, community-rooted, and emotionally resonant practices (Izquierdo et al., 2025; Skivington et al., 2021).

While 11 of the TDF domains were reported as influencing participants continued participation in the 'Dance On' program, 3 domains were not (see Fig. 1). Knowledge as a potential determinant of behaviour, did not emerge as a factor influencing adherence to the dance programme. However, the nature of the dance programme means that knowledge of routines or technical content was not important in that participants could engage without needing prior learning, memorisation, or sophisticated knowledge of dance routines (Britten et al., 2017). Furthermore, as participants had been attending for around 12 months, any initial knowledge demands would have been long established and no longer perceived as influential. Importantly, the absence of this domain is analytically informative, suggesting that for sustained participation, adherence may be driven less by cognitive or informational factors and more by experiential, embodied, and relational processes. Indeed, participants' accounts emphasised enjoyment, identity, routine, and social connection, aligning with growing evidence that these factors often outweigh knowledge in sustaining long-term physical activity (Madigan et al., 2024). These findings also highlight a potential limitation of the TDF in capturing affective and identity-based dimensions of maintenance, which may cut across multiple domains rather than sit discretely within a single theoretical category.

Similarly, the absence of the optimism domain in our findings may be attributed to participants' focus on the reported benefits that were immediate in nature such as enjoyment and social connection and this emphasis on the present experience likely overshadowed future-oriented constructs like optimism. Additionally, the prompts used during data collection were designed to elicit reflections on current experiences, which may not have sufficiently captured future-oriented constructs. Furthermore, the programme's design, emphasising instructor-led sessions with accessible cognitive load, may have reduced the salience of abstract future expectations, making them less likely to be reported. Taken together, these findings suggest that while COM-B and TDF are valuable for structuring analysis of behavioural influences, they may be less sensitive to the temporality, relationality, and embodied meaning that underpin long-term adherence, indicating a need for complementary perspectives when examining maintenance processes in community-based physical activity programmes.

Finally, the TDF domain of behavioural regulation did not emerge as influential in participants' continued engagement. Behavioural regulation often involves active strategies like action planning, self-monitoring, or goal setting. These may not have been necessary because the structure of 'Dance On' (set schedule, instructor-led) reduces the need for self-regulation. Participants may not frame their involvement in terms of goals or plans; instead, they may attend out of habit, enjoyment, or social routine. Notably, participants had already

been attending classes for a year or more, and their participation may now be automatic, rather than driven by conscious intention or behavioural regulation that may have been required when participants started participating in 'Dance On'. At the same time, it highlights a potential limitation of the TDF when applied to long-term engagement, as behavioural regulation may be most salient during initiation phases but less visible once participation is embedded within everyday life.

For those designing new interventions, these findings suggest a need to move beyond models that rely only on individual motivation, intention setting, or behavioural regulation elements that were notably absent from participants' narratives in this study. While these components may be important in earlier stages of behaviour change, they appeared less relevant once physical activity had become embedded in the weekly routines and identities of participants. Key facilitators of developing of automaticity were mentioned by participants. Engaging in an activity at a consistent time and location of the classes increases consistent repetition in the same context which is essential to development of automaticity (Gardner, 2015). Participants also highlighted the positive social support networks and enjoyment of the class, which is rewarding and can increase intrinsic motivation which, in turn facilitates the development of automaticity (Gardner & Lally, 2018; Judah et al., 2018). When behaviours become automatic, they become easier to perform, even when motivation and intention are low (Rebar et al., 2014), promoting long-term behavioural maintenance.

While applying both the COM-B and the TDF highlighted key capability, opportunity, and motivational processes supporting continued engagement in 'Dance On', the analysis also revealed tensions in applying these frameworks to long-term participation in a community-based physical activity context. Participants' accounts emphasised relational continuity, shared identity, and affective connection to the group, which developed over time, and given their contribution to early programme design, it is perhaps unsurprising that these relational, social, and identity-based aspects were apparent, even though they were not always readily accommodated within discrete behavioural domains (Phillips et al., 2015).

It is also important to note that 'Dance On' may be successful not solely because it activates COM-B or TDF domains, but because it redefines physical activity in ways that are culturally meaningful, socially embedded, and emotionally rewarding for older adults (Bone et al., 2024). These findings suggest that while COM-B/TDF remain valuable heuristic tools, they may be less sensitive to collective, experiential, and meaning-based processes that underpin sustained engagement. Recognising this broader perspective highlights the value of considering the cultural and social context of physical activity programmes alongside individual-level behavioural constructs. Given the above, the study contributes not only empirical insight into long-term adherence, but also a critical examination of the limits of widely used behaviour change frameworks.

#### 4. Strengths and limitations

A key strength of this paper is the use of both the COM-B model and Theoretical Domains Framework (TDF), which are closely aligned with the Medical Research Council (MRC) guidance on developing and evaluating complex interventions (Skivington et al., 2021). These theory-informed frameworks enable a detailed unpacking of the underlying mechanisms of behaviour change through the 14 domains of the TDF (Crane et al., 2012), supporting the MRC's emphasis on understanding mechanisms of action by illuminating psychological, social, and environmental influences. By integrating these models, this study ensures that the success of 'Dance On' has been examined in a behaviourally informed, context-sensitive way, grounded in transparent theory. Overall, this approach enhances the likelihood of understanding the reasons that this programme has been successful at ensuring adherence to a community based physical activity programme, which is in turn is more likely to drive the necessary biological changes to enhance health

and wellbeing. However, while the use of COM-B and TDF provided a robust theoretical structure to explore behavioural determinants of adherence, there are importance limitations. The exclusive reliance on deductive coding constrains analytic openness, as data were interpreted primarily through predefined categories, potentially overlooking novel, context-specific, or relational themes. This deductive focus may partially explain why certain TDF domains (e.g., knowledge, optimism, behavioural regulation) did not emerge and limits the likelihood of capturing meaning-oriented processes central to long-term engagement. While this approach was intentional and is acknowledged, future work should consider combining deductive approaches with inductive coding (Braun & Clarke, 2021) to identify themes beyond COM-B and TDF frameworks. Finally, as COM-B is a static model, it does not fully capture dynamic changes in behaviour over time. Despite these limitations, the structured approach provided a comprehensive understanding of the behavioural determinants underpinning adherence to the programme.

While the primary focus of this study was to explore sustained physical activity among older women given their historically lower rates of participation and specific barriers to engagement (Sport England, 2024), we included four male participants who were also long-term attendees of the 'Dance On' programme. While this could be viewed as a limitation in terms of demographic focus, the inclusion of men did not detract from the study's core insights. In fact, the experiences shared by male participants mirrored those of female participants. We suggest cautiously that the core mechanisms supporting long-term engagement in 'Dance On', such as emotional wellbeing, instructor rapport, and the welcoming group environment may transcend gender. Moreover, because the proportion of men in our sample reflected the actual gender balance of programme attendees (see Britten et al., 2017, p. 77% vs 89%), their inclusion offers a more complete picture of how *Dance On* operates in real-world settings, without undermining the study's focus on female physical activity.

Finally, this study focused on older adults who had sustained participation in 'Dance On' for at least 12 months, and as such reflects the perspectives of long-term adherers. Accounts were therefore predominantly positive and do not capture the experiences of individuals who discontinued participation or encountered barriers to sustained engagement. It remains possible that many of the factors identified here are also present among those who disengage, with differences emerging in their relative salience, timing, or interaction rather than in their simple presence or absence. In addition, the absence of certain TDF domains (e.g., knowledge, optimism, behavioural regulation) should be interpreted with caution, as non-mention may reflect participants' stage of engagement, the present-focused nature of the interview prompts, or the use of COM-B/TDF as sensitising analytic frameworks. Rather than indicating that these domains are unimportant, their absence may suggest that they are more salient during initiation or early engagement phases, or that they become backgrounded once participation is routinised. Additionally, the decision to collect minimal demographic data about the participants, while philosophically defensible, restricts interpretive depth. Factors such as health status, living situation, and material constraints may meaningfully shape both access to and motivation for participation, and could affect data. Future research should include this data in addition to integrating the perspectives of instructors and programme personnel to complement participant accounts to provide a more complete understanding of the factors contributing to sustained engagement in 'Dance On'. These limitations highlight the need for future research that includes disengaged participants and adopts longitudinal designs to more fully examine transitions between initiation, maintenance, and disengagement.

and activities that foster enjoyment and peer connection, rather than overly focusing on cognitive or goal-directed strategies.

#### 5. Conclusion

As the global population ages, developing effective and sustainable

strategies to increase physical activity among older adults is a pressing public health priority. The 'Dance On' programme represents a successful example of how community-based interventions can promote long-term behaviour change by addressing the psychological, physical, and social dimensions of activity through a behaviourally informed approach. Understanding the mechanisms behind this success through the BCW model including COM-B and TDF can in part inform the design of future programmes and tentatively guide policy toward scalable, equitable, and sustainable physical activity interventions for older adults. Given the known disparities in physical activity levels by gender and socioeconomic status (Harris et al., 2024; Sport England, 2024), initiatives like 'Dance On' could potentially offer a scalable and evidence-informed model for promoting activity in underrepresented groups. That 71% of participants remained engaged for over a year (Britten et al., 2017) demonstrates the programme's potential to overcome common barriers to long-term participation, especially in underserved areas. However, while we remain cautiously optimistic, we do acknowledge that the programme's success reflects its particular context and resources, and outcomes may differ in settings with less established infrastructure or different participants. Finally, the current study suggests future programmes should focus more on creating the conditions for engagement, including accessible venues, free or low-cost entry, familiar facilitators, and activities that foster enjoyment and peer connection, rather than overly focusing on cognitive or goal-directed strategies to initiate and sustain physical activity in women during later life.

#### CRediT authorship contribution statement

**Iaria Pina:** Writing – original draft, Methodology, Investigation, Formal analysis, Data curation. **Caitlin Gallagher-Hamill:** Validation, Formal analysis. **Alison Divine:** Writing – review & editing, Validation, Formal analysis. **Sarah L. Astill:** Writing – original draft, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization.

#### Data availability statement

The full interview transcripts supporting this study's findings are not publicly available due to the confidentiality agreements made with participants. Anonymised excerpts are provided in the paper. Additional qualitative data may be made available from the corresponding author upon reasonable request.

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#### Declaration of competing interest

The authors declare no competing interests.

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#### Data availability

Data will be made available on request.

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