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Effects of a museum-based social prescription intervention on quantitative measures of psychological wellbeing in older adults

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Keywords

emotion; intervention; measures; older adults; psychological wellbeing; social prescribing

Abstract

Aims: To assess psychological wellbeing in a novel social prescription intervention for older adults called Museums on Prescription and to explore the extent of change over time in six self-rated emotions ('absorbed', 'active', 'cheerful', 'encouraged', 'enlightened' and 'inspired').

Methods: Participants (n = 115) aged 65–94 years were referred to museum-based programmes comprising 10 weekly sessions, by healthcare and third sector organisations using inclusion criteria (e.g. socially isolated, able to give informed consent, not in employment, not regularly attending social or cultural activities) and exclusion criteria (e.g. unable to travel to the museum, unable to function in a group situation, unlikely to be able to attend all sessions, unable to take part in interviews and complete questionnaires). In a within-participants' design, the Museum Wellbeing Measure for Older Adults (MWM-OA) was administered pre-post session at start-, mid- and end-programme. A total of 12 programmes, facilitated by museum staff and volunteers, were conducted in seven museums in central London and across Kent. In addition to the quantitative measures, participants, carers where present, museum staff and researchers kept weekly diaries following guideline questions and took part in end-programme in-depth interviews.

Results: Multivariate analyses of variance showed significant participant improvements in all six MWM-OA emotions, pre-post session at start-, mid- and end-programme. Two emotions, 'absorbed' and 'enlightened', increased pre-post session disproportionately to the others; 'cheerful' attained the highest pre-post session scores whereas 'active' was consistently lowest.

Conclusion: Museums can be instrumental in offering museum-based programmes for older adults to improve psychological wellbeing over time. Participants in the study experienced a sense of privilege, valued the opportunity to liaise with curators, visit parts of the museum closed to the public and handle objects normally behind glass. Participants appreciated opportunities afforded by creative and co-productive activities to acquire learning and skills, and get to know new people in a different context.

INTRODUCTION

Social prescribing interventions have ranged from physical exercise (e.g. exercise referral, green gyms) to personal study (e.g. books on prescription, education on prescription) and creative activities (e.g. arts on prescription including dance, film, music and painting). Schemes that have sought to address the social determinants of health include information prescriptions (e.g. debt advice, housing, welfare); healthy living initiatives (e.g. smoking cessation, healthy eating, health checks); social enterprise

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schemes or social firms (e.g. community businesses, co-operatives, credit unions); and time banks, which are mutual volunteering schemes where people deposit time helping others and withdraw time when they need help. A review of social prescribing found that schemes demonstrated variable sustainability, and only 40% had been evaluated using a plethora of assessment types, two-thirds of which employed qualitative methods and a one third used quantitative methods.[1]

The review found that the most effective referral route involved a local link-worker or navigator placed in a primary care or third sector organisation, able to keep abreast of non-clinical community interventions and make appropriate referrals.[1]

Public Health England (PHE) stated that 'communities, both place-based and where people share a common identity or affinity, have a vital contribution to make in health and wellbeing' and that the 'assets within communities, such as the skills and knowledge, social networks and community organisations, are building blocks for good health' (p. 5).[2] Social prescribing aligns with local and national agendas to improve health and wellbeing and reduce health inequalities because it is 'patient-centred; not just what the NHS can do; it is a conduit for involving patients in their community and opening the channels between service sectors' (p. 4).[3] In terms of emerging models of care, NHS England advocated a social prescribing service in Rotherham where general practices work with advisors who keep abreast of voluntary services for patients with long-term conditions.[4] This scheme has reduced the number of accident and emergency visits, out-patient appointments and hospital admissions, though the authors point out that, due to diversity, a single model of care should not be applied everywhere. NHS England has identified social prescribing as a key means by which patients can benefit from wider provision; voluntary sector organisations in particular play a vital role in assisting the work of general practice in providing access to community-based practical support, and help for specific groups such as carers.[5] Similarly, the Welsh NHS Confederation found that the 'range of social prescribing projects and initiatives have the potential to make real progress towards improving population health and well-being and reducing demand on NHS Wales' (p. 1).[6]

Over the past decade, museums, including galleries across the world, have actively promoted their social value as a community-based asset, and the rise of 'Museums in Health' in research, policy and practice has flourished (p. 2).[7] In the United Kingdom, wellbeing has been actively integrated into museum programming to target vulnerable audiences including mental health service users, people with dementia, stroke survivors, and people with physical disability.[7] Research has shown that museum spaces and the collections they house provide opportunities for positive social interactions, calming experiences, learning and acquisition of new skills, leading to increased self-esteem, sense of identity, inspiration and opportunities for meaning making, in addition to reduced social isolation and decreased anxiety.[7] In a study of 300 hospital patients and care home residents, a mixed-methods framework was used to assess the impact of 30–40 min museum object handling sessions on participants, using pre-post session measures of psychological and subjective wellbeing alongside qualitative analysis of session recordings.[8–11] Quantitative measures showed significant increases in participant wellness and happiness scores.[8–10] Qualitative analysis revealed that patients 'used the heritage objects combined with tailored and easy social interaction, sensory stimulus and learning opportunities to tap into concerns about identity, emotions, energy levels and motivation' (pp. 8–12).[11] In a mixed-methods study using a pre-post design within an art gallery, outcomes showed that viewing and making art by people with dementia had an impact on episodic memory and verbal fluency.[12]

Notwithstanding the above, museums are relative newcomers to social prescribing with pilot events taking place from 2008 onwards, compared with arts and exercise on prescription available since the early 1990s. Despite their recent emergence into socially prescribed programmes, 'museums as local community resources are well-placed to offer public health interventions that are community-based, low-cost and non-clinical' (p. 146).[13] Furthermore, the 'role and value of museums in contributing to wellbeing or wellness agendas' was seen to merit broader exploration to 'reflect on the fit with a wider healthcare landscape' of social prescribing and other key health priorities (p. 10).[14] The first documented museum-based social prescribing scheme was 'Art-based Information Prescription' held at Tate Britain;[15] others include 'Recollection' at the Holburne Museum in Bath in 2014, 'Memory Lane Prescription for Reminiscence' at Oxford University Museums in 2015, and the 'Paper Apothecary' at the Beaney House of Art and Knowledge, Canterbury in 2013, the latter being by self-referral. A qualitative study of older adult group discussion of contemporary art found that participants' existing cultural and social capital was affected by their initial engagement, subsequent relationships, and development throughout the three gallery visits of the intervention.[16] Museums are also seen as suitable environments for people with mental health issues.[15] Qualitative evaluation of an art gallery intervention with people with dementia found that the setting was seen as valued, special and somewhere different, it provided intellectual stimulation in terms of engagement with art as a universal interest; offered opportunities for social inclusion, carer respite and support; and positively affected public perceptions of people with dementia.[17] Thematic analysis of an art-viewing and art-making intervention comprising eight 2-h sessions in two distinctly different galleries identified three main themes consisting of social interaction, cognitive capacities including engagement and new learning, and valuing the gallery setting.[18] The intervention helped foster social inclusion and social engagement, enhance the relationship between carers and people with dementia, and stimulate cognitive processes of attention and concentration.

Social inclusion is an important outcome in museum interventions as decrease in social isolation is a key contributor to wellbeing in older adults, and social engagement remains a critical

determinant of physical health into late adulthood.[19] Evidence shows that participatory arts in older age groups can challenge ideas of decline, re-connect people to communities and target health needs that threaten wellbeing.[20] A 2-year trial of a participatory arts activity that assigned older adults (65 and over) to either the intervention group (choral singing) or comparison group (usual activity) found higher positive effects for the intervention group in self-ratings of physical health (e.g. fewer doctor visits, less medication use, fewer falls), activity level, morale and loneliness, in contrast with the comparison group that demonstrated a significant decline.[21] Furthermore, correlational research indicates that social relations buffer the effect of neighbourhood deprivation on mental health–related quality of life.[22] A 3-month participatory arts project with a group of older residents from a disadvantaged urban community revealed benefits of social interaction and sense of identity with their community; it also provided opportunities for participants to explain through narrative accounts how they thought social capital had declined, and while they regarded the arts project as beneficial, they did not expect the neighbourhood to return to how it had been in the past.[23]

Traditional models of successful ageing propose the interdependence of multi-dimensional components, such as the low probability of disease and disability, maintenance of high cognitive and physical function, and sustained engagement with social and productive activities.[24] A recent study of adaptive ageing in oldest-old adults (octogenarians and centenarians) noted that this model failed to take into account the influence of subjective wellbeing.[25] The study suggested that positive affect was directly determined by social resources, such as the intensity of social interactions, and indirectly affected by cognitive functioning and education. To account for these findings and provide a comprehensive view of ageing from a lifespan perspective, the authors drew upon a model of developmental adaptation[26] and integrated this into a new model of health and wellbeing in the oldest-old that included the influence of coping behaviours for past and current events, and subsequent appraisal of them.

The reported study was a museum-based intervention that aimed to offer 10-week programmes of engaging, creative and socially interactive sessions, of around 2 h each, comprising curator talks, behind-the-scenes tours, object handling and discussion, and arts activities inspired by the exhibits. The objectives were to measure psychological wellbeing using the Museum Wellbeing Measure for Older Adults (MWM-OA); a custom designed scale for museums and heritage activities developed and validated for older adults.[27,28] The MWM-OA assesses psychological wellbeing as an indicator of the mental state of the individual and although there are other aspects of wellbeing such as physical and social wellbeing, the measure focuses on levels of self-reported changes in six emotions found to be aspects of wellbeing more likely to change as a result of a relatively short intervention, such as participating in a museum or gallery activity. It was hypothesised that psychological wellbeing would improve over single sessions and across the programme and that all six emotions comprising the measure would contribute to this improvement.

METHODS

Design

In a within-participants’ design, measures were taken pre- and post-session at three time-points (start-, mid- and end-programme) with the pre-session start measure used to provide baseline data (Figure 1). The dependent variable was the score for each emotion (absorbed, active, cheerful, enlightened, encouraged and inspired) in the six-item Wellbeing Measure – Older Adult, rated out of five (e.g. 5 = I feel extremely ..., 4 = I feel quite a bit ..., 3 = I feel fairly ..., 2 = I feel a little bit ... and 1 = I don’t feel ...) giving a minimum score of 6 and a maximum score of 30.

Participants

Participants comprised vulnerable, older adults (n = 115) aged 65–94 years at risk of loneliness and social isolation referred by health and social care, and third sector organisations in central London and Kent using inclusion/exclusion criteria (Appendix 1). Participants were of mixed gender and ethnicity with 63% female and 82% White British. Participants were able to give informed consent to take part, function in a group situation, and travel to the museum using private or public transport. Participants were invited to attend the sessions with a carer, friend or family member if they wished. Although not ostensibly a dementia intervention, people with mild to moderate dementia who fulfilled the other criteria were accepted onto the programmes.

Materials

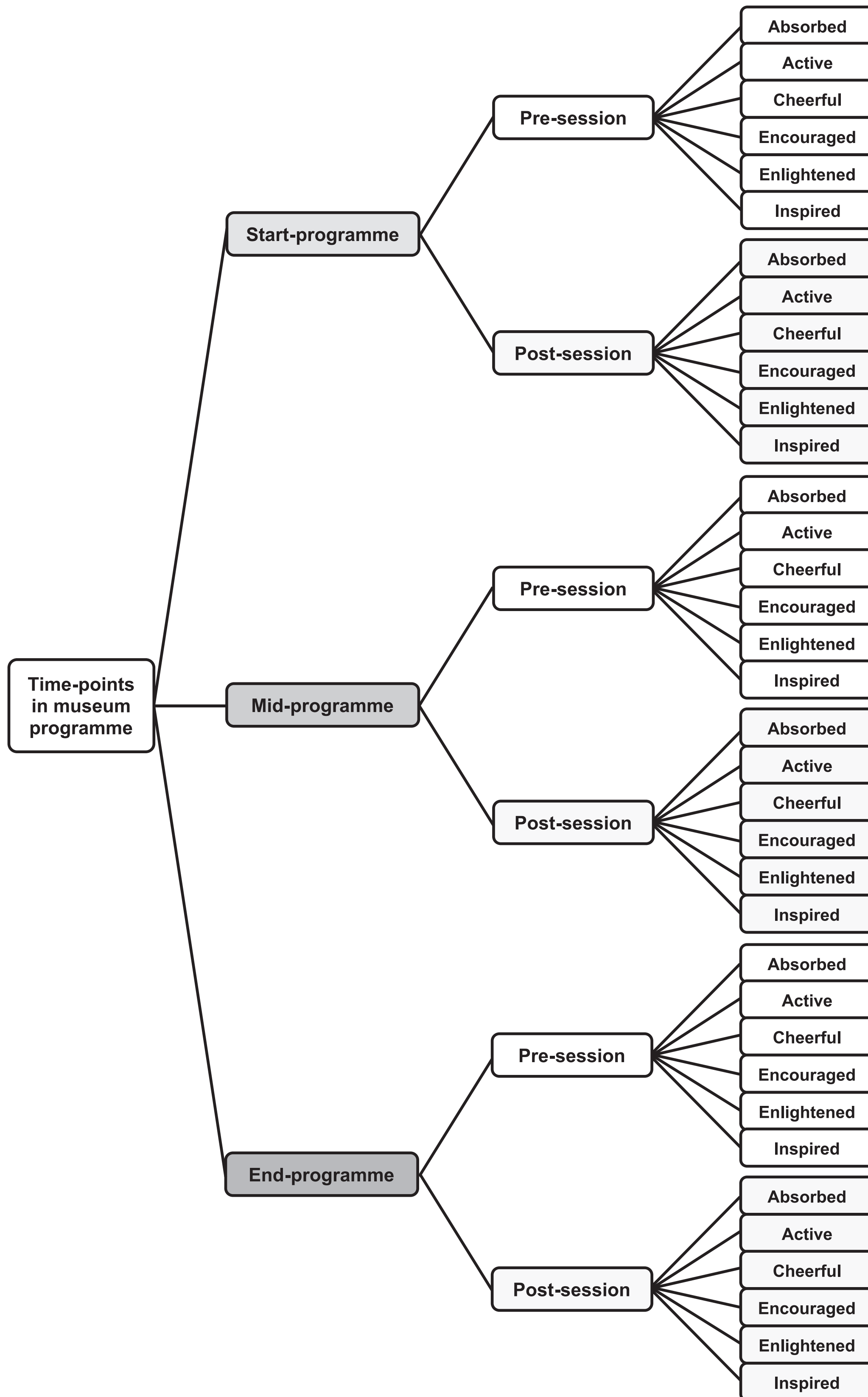
Materials comprised the recruitment poster; inclusion/exclusion criteria (Appendix 1); consent form; participant information leaflet; participant demographics form; museum offer document outlining key requirements for the programme such as access, session duration, suitability of activities, refreshments and breaks; and the MWM-OA.[27,28]

Procedure

Ethical approval was obtained for the project (UCL Research Ethics Committee, Project ID: 4526/001). Seven museums (four in central London and three in Kent) were asked to provide one or two programmes of museum-based sessions, in keeping with the museum offer document. The social prescribing intervention consisted of 12 programmes of 10 weekly 2-h sessions conducted over two years (2015–2017). After checking the inclusion/exclusion criteria, suitable participants were sent the museum schedule, consent form and information leaflet. Researchers attended all sessions in their respective locations, plus sample sessions in the other locations, administered the measures, and carried out in-depth interviews with participants and their carers where present, museum facilitators and volunteers. Participants kept weekly diaries reflecting upon the sessions prompted by guideline questions. Data were anonymised and stored in a secure database (UCL Data Protection

Figure 1

MANOVA 3 × 2 × 6 design



Registration Ref: Z6364106/2015/05/53: Section 19, Research: Social Research).

RESULTS

Means and standard deviations were examined for scores from the MWM-OA (Table 1). All six emotions in the measure showed pre-post session improvement across the three time-points (start-, mid- and end-programme) at which measures were taken. The emotion ‘cheerful’ consistently achieved the highest score whereas ‘active’ was always the lowest; ‘enlightened’ and ‘absorbed’ increased more than other emotions pre-post session, particularly at the start.

A three-way, 3 × 2 × 6, within-participants' multivariate analysis of variance (MANOVA) was carried out with factors of programme (start, mid and end) by session (pre and post) by emotion (absorbed, active, cheerful, encouraged, enlightened and inspired); the partial eta squared statistic was used to examine effect size. Results of the MANOVA showed a highly significant main effect of programme, $F(2,116) = 13.316$, $p < .001$, partial eta squared = 0.187; a highly significant main effect of session, $F(1,58) = 95.168$, $p < .001$, partial eta squared = 0.623; a highly significant main effect of emotion, $F(5,290) = 8.847$, $p < .001$, partial eta squared = 0.132; and a highly significant interaction of session by emotion, $F(5,290) = 5.343$, $p < .001$, partial eta squared = 0.084. There were no significant interactions of programme by session, $F(2,116) = 2.480$, $p < .088$, partial eta squared = 0.041; programme by emotion, $F(10,580) = 1.066$, $p < .386$, partial eta squared = 0.018; or programme by session by emotion, $F(10,580) = 1.227$, $p < .273$, partial eta squared = 0.021.

To examine the main effect of the programme, a two-way, 3 × 2 (programme by session), within-participants' MANOVA was carried out. Results showed a highly significant effect of programme, $F(2,120) = 14.338$, $p < .001$, partial eta squared = 0.193; and a highly significant effect of session, $F(1,60) = 104.171$, $p < .001$, partial eta squared = 0.635. Bonferroni *t*-tests showed a highly significant difference between pre-session wellbeing scores when start- and mid-programme measures were compared, $t(70) = 3.528$, $p < .002$; and a highly significant difference between post-session wellbeing scores when start- and mid-programme measures were compared, $t(69) = 2.415$, $p < .036$, one-tailed; but no significant differences between mid- and end-programme for pre-session, $t(73) = 0.768$, $p < .890$; or post-session wellbeing, $t(71) = 1.011$, $p < .632$, one-tailed (Figure 2).

To examine the effect of the interaction, three (start-, mid- and end-programme) two-way, 2 × 6 (session by emotion), within-participants' MANOVAs were carried out. Results showed that all emotions increased highly significantly pre-post session for start-programme, $F(1,88) = 72.228$, $p < .001$, partial eta squared = 0.451; for mid-programme, $F(1,83) = 67.651$, $p < .001$, partial eta squared = 0.449; and for end-programme, $F(1,76) = 54.689$, $p < .001$, partial eta squared = 0.418 (Figure 2). Findings showed that two emotions (enlightened and absorbed) were responsible for the effect of the interaction and increased more pre-post-session than the other four emotions. As the smallest increase between end-programme post-session ‘active’ and ‘absorbed’ was significant, $t(76) = p < .026$, one-tailed (Figure 3), it follows that the other increases were also significant.

DISCUSSION

In line with the experimental hypothesis, psychological wellbeing as measured by the MWM-OA improved significantly between pre- and post-session for measures taken at start-, mid- and end-points of the 10-week programme. The mean pre-post session scores from these three time-points improved significantly over the programme. All six emotion words in the scale showed significant improvements pre-post session and pre-post programme where ‘cheerful’ was consistently rated as the highest level emotion, and ‘active’ was consistently rated as the lowest level emotion. Unlike the original validation of the MWM-OA, where items contributed more or less equally to the model,[28] the words ‘enlightened’ and ‘absorbed’ were rated disproportionately higher than the other four emotions when pre- and post-session scores were compared, and this difference was most noticeable at the start of the programme, though maintained at a significant level throughout the 10 weeks.

The finding that MWM-OA items showed significant statistical improvement over time raised a question about the extent of positive change needed to be clinically meaningful. Determining clinically meaningful change is important because small numerical differences in mean scores can produce statistically significant results when large sample sizes are compared but might convey little about the meaningfulness of the change, such as that perceived by participants as beneficial.[29] For physiological measures, comparison of repeated tests across time has led to an awareness of the level of change constituting a clinically meaningful difference but with health-related quality-of-life measures, such as wellbeing, the meaning of change ‘is less intuitively apparent, not only because it has no familiar units, but also because health professionals seldom use quality of life measures in clinical practice’ (p. 81).[30] Two main methods of identifying clinically meaningful change in quality of life measures were identified: anchor-based and distribution-based; the former comparing quality-of-life measures with those clinically relevant, the latter comparing quality-of-life measures across different disease-related groups.[31]

As this study did not work with clinical measures or clinical groups, interpretation of effect sizes as an alternative to these methods was employed to determine clinically meaningful change.[31] A comprehensive review of health status measures advocated that a small effect could determine a minimal clinically important difference,[32] for effect sizes classified as small (>0.20), moderate (>0.05) and large (>0.08).[33] Findings from this study attaining clinically meaningful change therefore comprised pre-post session improvement for pooled emotion items (>0.60), and pre-post session improvement for each item (>0.40), at

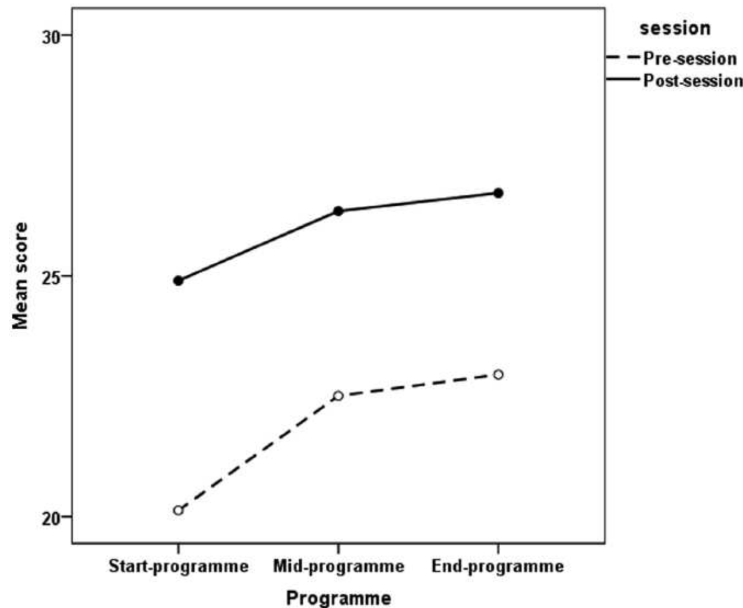
Table 1

Means and standard deviations (SD)

Time-point in programme	Time-point in session	MWM-OA emotion	Mean	SD
Start-programme	Pre-session	Absorbed	3.254	1.027
		Active	3.220	1.365
		Cheerful	3.814	1.025
		Encouraged	3.509	1.150
		Enlightened	3.034	1.050
		Inspired	3.339	1.060
	Post-session	Absorbed	4.288	1.051
		Active	3.881	1.233
		Cheerful	4.339	0.902
		Encouraged	4.153	0.979
		Enlightened	4.186	0.919
		Inspired	4.137	1.090
Mid-programme	Pre-session	Absorbed	3.644	1.171
		Active	3.661	1.076
		Cheerful	4.000	1.050
		Encouraged	3.864	0.991
		Enlightened	3.746	1.123
		Inspired	3.746	1.092
	Post-session	Absorbed	4.509	0.626
		Active	4.068	0.926
		Cheerful	4.509	0.704
		Encouraged	4.373	0.667
		Enlightened	4.458	0.703
		Inspired	4.356	0.737
End-programme	Pre-session	Absorbed	3.763	1.088
		Active	3.661	1.092
		Cheerful	4.102	1.062
		Encouraged	3.983	0.919
		Enlightened	3.763	1.056
		Inspired	3.864	1.106
	Post-session	Absorbed	4.441	0.702
		Active	4.186	0.880
		Cheerful	4.661	0.605
		Encouraged	4.559	0.623
		Enlightened	4.458	0.652
		Inspired	4.339	0.883

Figure 2

Pre-post session means across the programme



start-, mid- and end-programme. Effect sizes use group effects rather than individual effects, consequently individual differences were captured with qualitative analysis examining participant thoughts and feelings recorded in weekly diaries and end-programme interviews. These provided insight into emotional changes across the programme.

A snapshot of previously reported qualitative findings with relevance to the MWM-OA items is presented here for illustrative purposes.[34] In talking about their experiences, participants often used the same or similar words to those rated in the MWM-OA, such as 'absorbing', encouraging', enlightening' and 'inspiring'; although on the surface this offers further validation of the MWM-OA, it is difficult to separate the spontaneous use of words in diary entries from the influence of words previously seen in the measure, though these were not retained for reference by the participants. When interviewed, many participants highlighted the opportunity to handle museum objects and engage with collections and curators; they commented on learning new information and being absorbed by it, and acquiring new skills, which could account for increases in the 'absorbed' and 'enlightened' items of the measure. On the negative side, some participants reported feeling 'exhausted' by the sessions that often involved walking between galleries, which could explain why the word 'active' was the lowest rated, though it does not account for why it also started lower, unless participants already felt tired on arrival, not being regular travellers or users of public transport.

Participants noted the importance of facilitators 'listening to our ideas' and how helpful it was to feel 'intellectually challenged'. It has been argued that when individuals interact with museums and their collections, it is the intrinsic physical and material properties of the objects they encounter that trigger memories, projections, sensory, emotional and cognitive associations.[35,36] Museum objects may function as symbols for aspects of people's lives such as identity, relationships, nature, society and religion; these symbolic and meaning-making properties could account for their therapeutic potential; and the physical, cognitive and emotional interactions elicited by these multi-sensory object engagements have been identified as the unique value that museums can bring to public health interventions.[26]

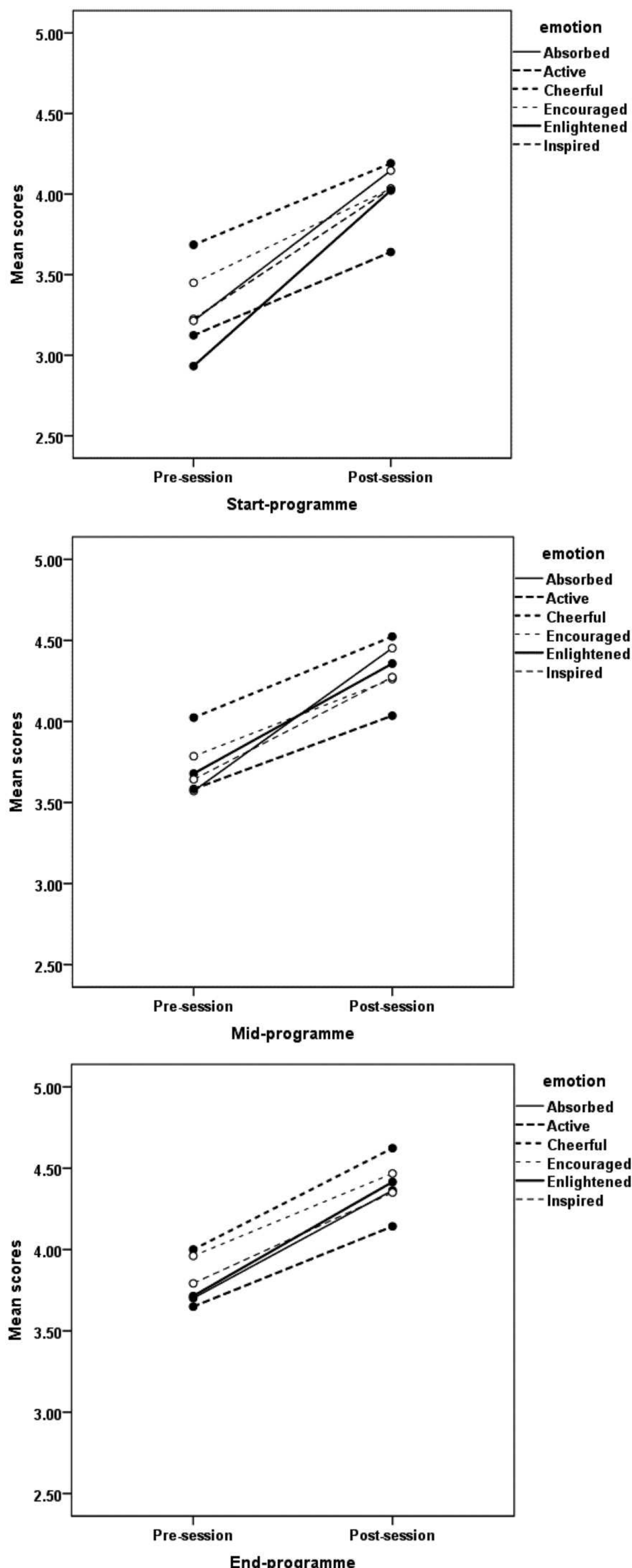
Participants welcomed the opportunities to engage with students and other volunteers who gave talks about their work; they reported how much they enjoyed meeting younger people and hearing about their studies. A qualitative study of older adult group discussion of contemporary art (p. 1010)[16] described social capital outcomes as 'bonding' between participants, 'bridging' between participants and group leaders, and 'linking' between participants, art educators or researchers. Similarly, in this study bonding occurred and several participants stayed in touch with one another after the programme; there was evidence of bridging in that participants were especially keen to talk to museum staff who they met on a weekly basis; and short-term linking was noted when participants had the opportunity to talk to artist-educators, students and volunteers encountered for one or two sessions. One participant commented that it brought them into contact with a much wider range of people than they would normally meet, others talked about getting to know people in a 'different context' or 'under different circumstances'.

Previous authors have shown that high levels of social resources have a direct effect on positive affect and physical health, whereas cognitive functioning and education have an indirect effect on positive affect.[25] The social resources engendered by the museum-based programme directly increased the positive affect demonstrated by significant improvements in the wellbeing emotions, and it is likely that physical health for some participants will also improve; one participant reported that since taking part in the museum programme they felt 'more positive about my life and health' and 'more determined to keep up my practice of photography and painting' that required a level of physical fitness as the participant had formed a 'meet-up' group to go sketching in and around a contemporary art gallery.

In terms of developmental adaptation,[26] participants seemed keen to share their ideas, memories and past experiences

Figure 3

Pre-post session changes in emotions over programme



which they tended to express in a positive light with reference to 'learning curves' and 'knowing better next time'. Some past experiences were relevant to sessions though were not necessarily reflective of formal education opportunities; one participant who had grown up in West Africa was able to identify several handling objects from an anthropological collection, another originally from Central America talked knowledgeably about gold and copper in a session about forms of currency. Several participants commented on their plans to visit museums or galleries more often in the future, despite not being frequent visitors prior to the programme; several participants referred to 'filling in the gaps' or 'tying up lose ends' in their knowledge, and others stated their intentions to continue with their education by joining adult education classes in computing, local history, and arts and crafts.

The majority of research on the impact of museums has focused on social and learning outcomes rather than economic impact; where economic research has been undertaken, this has occurred at local level, or provided national estimates for museums in combination with archives and libraries.[37] In a review of museums' economic impact, it was found that some of the most frequently cited economic contributions were indirect contributions, including local economic development and regeneration, learning and skills, health and wellbeing, and environment and climate change, with actual economic impact mainly from tourism.[37] The Happy Museum Project, for example, sought to demonstrate the qualities that cultural institutions can foster in terms of institutional and communal wellbeing and resilience in the face of global challenges.[38]

It is interesting, therefore, to consider the potential economic impact of culturally oriented social prescribing programmes, such as Museums on Prescription, specifically in terms of health and wellbeing but also for community regeneration and forging a more equable society.[39] Many museums have skills and expertise suitable for wider audiences such as disadvantaged, vulnerable and older adults and can provide access-appropriate community spaces within inspirational environments. Museums and other heritage

sites employ volunteers as part of community teams, and these people could be trained to work within a social prescribing framework liaising with local link-workers or navigators in primary care or third sector organisations. In order for social prescribing of museums to be sustainable on a national scale, museum partners in this study expressed a preference for rolling rather 10-week programmes taking place less often, such as every 2 weeks, run chiefly by trained volunteers with participants attending on a drop-in basis. They also considered sending volunteers and museum staff on training courses administered by their sector organisations for working with specific groups within the community such as those in addiction recovery and with mental health issues.

CONCLUSION

Museums can be instrumental in offering older adult activities that improve psychological wellbeing and may lead to long-term outcomes such as sustained social capital and enhanced physical health. Although geographically extensive and carried out over 2 years, each museum-based programme was relatively short term at 10 weeks, and a rolling programme of older adult activities needs to be implemented to examine sustained effects on health and wellbeing over several years. Participants in the Museums on Prescription study rated highly the experiences of feeling absorbed and enlightened by the sessions and commented on the opportunities afforded by the museum-based activities to acquire new learning and develop new skills. The high levels of significance and effect sizes in the study infer that findings can be generalised more widely to other populations of vulnerable and lonely older adults at risk of social isolation and imply that provision of socially prescribed museum-based sessions could be scaled up nationally to address social and cultural inequities. The reported study contributes to a wider body of evidence on how cultural engagement can bring about positive outcomes for older adults at risk of social exclusion by improving positive emotion; it is likely that this occurs through creative processes involving new learning and acquisition of skills, and the formation of social capital through co-productivity, exchange of ideas, and enhanced sense of community and belonging.

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CONFLICT OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

ETHICAL APPROVAL

The research obtained research ethics approval from the UCL Research Ethics Committee, Project ID: 4526/001: Museums on Prescription.

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APPENDIX 1
Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Aged 65–94 years	Aged 64 and younger, or 95 and older
Socially isolated in own home or a care home (if there is evidence of isolation from other residents)	Not socially isolated as living with family/friends or, if in a care home, socialising with other residents
Not in any paid or voluntary employment, either full-time or part-time	In full-time or part-time employment, either paid or voluntary
Not regularly attending social and/or cultural activities such as clubs or classes	Regularly attending social and/or cultural activities such as clubs or classes
Able to give own informed consent to take part in the research study	Unable to give own informed consent to take part in the research study
Able to take part in interviews and complete questionnaires prior to the first and after each of 10 weekly sessions and telephone interviews at 3 and 6 months after the sessions	Unable to take part in interviews and complete questionnaires prior to the first and after each of 10 weekly sessions and telephone interviews at 3 and 6 months after the sessions
Able to read and write English sufficiently well to take part in interviews and complete questionnaires, and able to speak English sufficiently well to converse socially	Speakers of other languages unable to read and write English sufficiently well to take part in interviews and complete questionnaires, and unable to speak English sufficiently well to converse socially
Able to travel to the museum using public or private transport (could be with help of carer/befriender or local third sector organisation providing transport)	Unable to travel to the museum using public or private transport

(Continued)

APPENDIX 1 (Continued)

Inclusion criteria	Exclusion criteria
Available to attend weekly sessions, one per week for 10 weeks (either during morning or afternoon depending on which is offered by the museum)	Unlikely to be able to attend all weekly sessions for 10 weeks (this could be due to recurring illness or hospital visits)
Able to function in a group situation (group size 8–10 older adults plus carers/befrienders and museum facilitators)	Unable to function in a group situation (e.g. people who are psychotic, have social phobias, experience panic attacks or epileptic seizures, or have mental or physical symptoms likely to be distressing to other group members)
Able to see and hear sufficiently well to take part in group activities	Unable to see and hear sufficiently well to take part in group activities (local museums may not have induction loop access)
Able to use hands and arms sufficiently well to hold objects and/or participate in arts/crafts activities (without the potential risk of harm to self, other participants, museum staff and/or museum collections)	Unable to use hands and arms sufficiently well to hold objects and/or participate in arts/crafts activities (particularly where this may represent potential risk of harm to self, other participants, museum staff and/or museum collections)
Able to move around the museum (this could be with a wheelchair and/or with the help of a carer/befriender)	Unable to move around the museum (this could be with a wheelchair and/or with the help of a carer/befriender)
Able to use museum facilities such as lifts and toilets (this could be with a wheelchair or/and with the help of a carer/befriender)	Unable to use museum facilities such as lifts and toilets (this could be with a wheelchair and/or with the help of a carer/befriender)
With mild, early stage dementia (although museum sessions are not intended for people with dementia, they can be included if they fulfil the other criteria)	With moderate to severe/mid to late stage dementia