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Original Research

Online songwriting reduces loneliness and postnatal depression and enhances social connectedness in women with young babies: randomised controlled trial

R. Perkins [a, b, *], N. Spiro [a, b], G. Waddell [a, b]

[a] Centre for Performance Science, Royal College of Music, Prince Consort Road, London SW7 2BS, UK
[b] Faculty of Medicine, Imperial College London, South Kensington Campus, London SW7 2AZ, UK

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ABSTRACT

Objective: Loneliness is a public health challenge associated with postnatal depression (PND). This study developed and tested an online songwriting intervention, with the aim of reducing loneliness and symptoms of PND and enhancing social connectedness among women with young babies.
Study design: This was a two-armed non-blinded randomised controlled trial (RCT, ISRCTN17647261).
Methods: Randomisation was conducted in Excel using a 1:1 allocation, with participants ($N = 89$) allocated to an online 6-week songwriting intervention (*Songs from Home*) or to waitlist control. Inclusion criteria were women aged ≥18 years, with a baby ≤9 months old, reporting loneliness (4+ on UCLA 3-Item Loneliness Scale) and symptoms of PND (10+ on Edinburgh Postnatal Depression Scale [EPDS]). Loneliness (UCLA-3) was measured at baseline, after each intervention session and at 4-week follow-up. The secondary measures of PND (EPDS) and social connectedness (Social Connectedness Revised 15-item Scale [SC-15]) were measured at baseline, postintervention and at 4-week follow-up (Week 10). Factorial mixed analyses of variance with planned custom contrasts were conducted for each outcome variable comparing the intervention and control groups over time and across baseline, Weeks 1–6 and the follow-up at Week 10 for each outcome variable.
Results: Compared with waitlist control, the intervention group reported significantly lower scores postintervention and at follow-up for loneliness ($P < 0.001$, $\eta^2_P = 0.098$) and PND ($P < 0.001$, $\eta^2_P = 0.174$) and significantly higher scores at follow-up for social connectedness ($P < 0.001$, $\eta^2_P = 0.173$).
Conclusions: A 6-week online songwriting intervention for women with young babies can reduce loneliness and symptoms of PND and increase social connectedness.

Introduction

Loneliness is associated with physical and mental health problems, including mortality.[1,2] It affects one-third of people in industrialised countries, making it a significant public health problem.[3] Loneliness is different from social isolation and arises when an individual feels dissatisfied with their social relationships.[4] In the United Kingdom – both before and during the COVID-19 pandemic – some groups have a higher risk of loneliness, including young adults and women.[5] Loneliness has been suggested to be the 'opposite' of social connectedness, 'a subjective psychological bond that people feel in relation to individuals and groups of others'[6] that incorporates caring about others, feeling cared for and belonging.[7]

Crucially, social factors are known to be a key predictor of the perinatal mental illness postnatal depression (PND). UK health records indicate that more than one in 10 women have a depression diagnosis or depressive symptoms in the year after giving birth, with more than one in eight receiving antidepressant medication.[8] PND is debilitating for those experiencing symptoms and has repercussions for fathers,[9] mother–baby bonds,[10] and children's social-emotional development.[11] PND requires attention because suicide is the leading cause of mortality in the first year after giving birth.[12] Low or lacking social support postnatally is a risk factor for PND,[13] and there are identified links between functional and informal social support and lower incidence of PND.[14] Importantly, social support – or lack

* Corresponding author. Centre for Performance Science, Royal College of Music, Prince Consort Road, London SW7 2BS, UK.
E-mail address: rosie.perkins@rcm.ac.uk (R. Perkins).

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thereof – also links with *experiences* of loneliness among women with PND.[15] Luoma et al., for example, demonstrated that 34–38% of a sample of mothers reported loneliness and that maternal loneliness was associated with the presence of depressive symptoms.[16] A recent meta-synthesis confirmed that loneliness appears to play an important role in the experience of perinatal depression.[17] Generally, it is well established that loneliness is linked with depression and poorer mental health outcomes.[18]

There can be challenges with detection and treatment for PND,[19] and interventions targeting loneliness are disproportionally designed for, and tested with, older adults.[20,21] Loneliness in depression has been identified as a potential target for the development and testing of interventions[18] but there is a significant gap in how to reduce loneliness among people with perinatal mental illness. This study therefore focused on the development and testing of a songwriting intervention to tackle loneliness and enhance social connections among women with PND. Built from the above evidence base, the study was underpinned by four drivers. First, social support may prevent or reduce PND. Second, people with PND can feel lonely, which is, in turn, associated with poorer mental health outcomes. Third, there is a lack of psychosocial interventions that are specifically designed to build social connections and reduce loneliness among people with PND and that are delivered online. Online delivery may address issues of access and equity recognising that there can be financial, social, practical or health barriers to in-person interventions. Fourth, previous research has demonstrated that in-person group singing can speed up recovery from PND[22] as well as support connections with other mothers and enhance mother–baby closeness.[23,24] While the COVID-19 pandemic catalysed research into the efficacy of online singing groups for PND,[25] evidence in this field remains in its infancy, and further studies are required. Songwriting has been previously investigated in a variety of clinical settings, including for addressing emotional or psychological challenges and facilitating the telling or sharing of stories.[26] It was selected in this study as a process previously used in perinatal contexts,[27,28] including to support social connections,[29] that could be particularly suited to the online context because of the potential for different creative processes that can be both synchronous and asynchronous (see 'The intervention' section). More widely, music has been reported to support social connectedness[30] and social bonding,[31] but little is known about the potential for online songwriting to support perinatal loneliness and depression.

Three hypotheses were therefore tested regarding scores among an online intervention (songwriting) group compared with a control group.

H1. significantly larger decrease in self-reported loneliness scores over time

H2. significantly larger decrease in self-reported PND scores over time

H3. significantly larger increase in self-reported social connectedness scores over time

The intervention

The *Songs from Home* songwriting intervention included free weekly online songwriting sessions in groups of 9–12 people. Following previous research,[22] the intervention lasted 6 weeks. The development of the intervention was supported by Personal and Public Involvement (PPI), undertaken via two online focus groups in which participants discussed experiences of motherhood, existing resources and support, and key features and success markers of a potential online songwriting programme. Focus groups information informed (1) activity description in publicity materials (e.g. to be inclusive and welcome all levels of musical experience), (2) content of the sessions (e.g. some activities for mothers and some for babies, have a workspace between sessions), (3) the goals of the sessions (e.g. a sense of achievement), (4) the social aspects of online work (e.g. including time for conversation) and (5) timing, frequency and duration of sessions (e.g. weekly, hour-long sessions).

Informed by the PPI stage, each intervention session included a 60-min synchronous online workshop hosted via Zoom, led by one of two professional music workshop leaders and supported by one of two musically trained research assistants. Participants also had access to an asynchronous workspace hosted online through Trello.com. The workshops included a welcome and warm-up, facilitated songwriting composition through discussion of ideas, refinement of lyrics and creation of melody, and group singing of songs. No musical style was specified, and leaders and assistants accompanied songs using instruments such as violin or ukulele. Women attended with and without their babies. Following the co-construction phase, the leaders articulated four session goals: to create feelings of comfort and safety; to facilitate achievement; to support participants' connection with their children and their own musical selves; and to adapt to individuals by being responsive to their needs, cultural backgrounds and identities. These goals were addressed using fundamental principles or techniques. For example, in working toward feelings of comfort and safety, the music leaders ensured that participants frequently had control of the specifics of the content and that there were a variety of approaches to song creation to allow for varying levels of confidence and prior experience.[32]

In line with this approach, there were several ways in which the lyrics and melodies were developed and recorded. Here we provide two examples of possible creative processes, with more information provided elsewhere.[32] Some songs were developed quickly, and others were worked on over several weeks. Those developed more quickly – which typically happened near the beginning of sessions – were designed to be small creative tasks that should be straightforward to contribute to and celebrate the participants' creativity. Several techniques were used for each stage. For example, to facilitate a collaborative route to choosing ideas to focus on in a song, the music leader created a graphic of a wiggly line on the Zoom whiteboard, with the idea of the peaks and troughs of a parenting day. The participants could contribute ideas either by writing them on the line or in the Zoom chat option or by suggesting them verbally. Once several ideas had been shared, the music leader asked the participants what topic jumped out to them, and this formed the basis for the song.

The larger songwriting tasks were spread over several weeks, and everyone was offered a chance to contribute in their preferred way in every session. The leaders began the process by discussing a proposed topic as a group. Ideas could be noted on a group whiteboard, through the Zoom chat function, or verbally with a research assistant noting in the chat what was being said. A week later – so that there would be less individual association with ideas and more of a sense of shared ownership – lyric writing would begin. For this, the music leader would ask participants in turn what phrases from the discussion resonated with them, and then as a group, they would edit the ideas into lyrical phrases. In a later session, they worked on the melody. The leaders capitalised on the online context and used the mute function to encourage some unselfconscious creativity. The music leader shared the first few lines of lyrics on the screen and played a chord progression round and round on a ukulele, asking the participants to sing the first line (on mute) however they felt it should go and to try it in several different ways if they wanted to. The music leader then asked for

volunteers to sing their ideas. She always accepted the first idea and found that once someone had sung the first section, other participants seemed more confident either to sing the next section or to edit and add to it. In the following session, the music leader would sing the song back, fully formed, and ready for the group to sing together. Participants were sent recordings of two or three of the created songs, recorded by the music leaders, following the 6-week intervention.

Methods

Design

A two-armed, non-blinded randomised controlled trial (RCT) with a non-intervention waitlist control group was registered with the ISRCTN registry (ISRCTN17647261, first registration 15/09/2021) and run from 17 September 2021 to January 2022. The intervention was offered in separate groups to optimise group sizes, and those in the waitlist control group offered the same non-measured intervention following their involvement in the trial. Two 6-week intervention groups ran from September to November 2021, with follow-up in December 2021, and two further 6-week groups ran from November to December 2021, with follow-up in January 2022 when the trial concluded as planned. No adverse events were reported. The mean attendance was 3.91 sessions (median = 4.00, standard deviation [SD] = 1.44) out of six.

Outcome variables

Demographic data were collected at baseline. The primary outcome variable was the UCLA 3-Item Loneliness Scale (UCLA-3), frequently used in loneliness interventions.[33] This short 3-item scale was administered via an online questionnaire at eight points (and at equivalent time points for the control group): at baseline (2 weeks before intervention start), immediately following each of the six synchronous online sessions and at follow-up 4 weeks after the end of the intervention. The secondary outcome variables included measures of social connectedness (Social Connectedness Revised 15-item Scale [SC-15][34]) and PND symptoms (Edinburgh Postnatal Depression Scale [EPDS][35]). Data on secondary outcomes were collected via an online questionnaire at baseline (2 weeks before intervention start), immediately following the final synchronous session and at 4-week follow-up. All data were collected through Microsoft Forms and Qualtrics.

Participants

All procedures involving human participants were approved by the Conservatoires UK Research Ethics Committee on 5 March 2021 [CUK/RCCSD/2020-21/5] and amended on 2 August 2021 [CUK/SF/2020-21/5/2]. Written informed consent was obtained online from all participants. Recruitment was conducted through the project's organisational partner Happity through their established communication channels (Web site, emailed newsletters and social media), as well as through online advertising via the research team. As such, the study makes use of a community rather than a clinical sample.

PPI focus groups

Fourteen mothers from across the United Kingdom, aged >18 years, participated in the focus group. They all had experience of motherhood, self-reported loneliness and/or self-reported symptoms of PND in the last 3 years. Their most recent baby was between 9 months and at most 3 years old.

Randomised controlled trial

Participants registered their interest for the project and underwent a screening process. Eligibility criteria were people identifying as women, aged ≥18 years, with a baby aged ≤9 months, experiencing some loneliness (scoring 4+ on UCLA-3), and reporting symptoms of PND (scoring 10+ on EPDS). Once fully consented, eligible participants were randomly allocated to either the intervention or control group. Randomisation was conducted in Excel using a 1:1 allocation and random number generation and custom sort functions, stratified by loneliness scores (UCLA), PND scores (EPDS) and age of baby. Independent samples *t*-tests conducted before the randomisation groupings were implemented confirmed no significant differences or meaningful effect sizes between groups across these variables. Randomisations, enrolment and assignment of participants to the intervention/control group were conducted by the authors, independently of the workshop leaders and research assistants who led and attended the workshops.

A meta-analysis of previous research examining loneliness interventions[33] demonstrated a small effect of 0.198 among RCTs (with a larger effect of 0.459 in controlled studies using non-randomised group allocation). Power analysis (assuming two groups with measures at eight points and measure correlation of 0.7[33]) indicated a minimum of 68 participants divided across the intervention and control groups to determine the significance of an effect of similar size. Ninety-four participants were recruited and consented in two waves of recruitment (September 2021 and November 2021; see Fig. 1). Five participants consented but took no further part in the study, leaving a total of 89 participants. The mean UCLA score at baseline was 7.55 (SD = 1.22, range = 6–9; intervention mean = 7.53 [SD = 1.24]; control mean = 7.30 [*SD* = 1.29]), the mean EPDS score at baseline was 16.51 (SD = 3.56, range = 10–24; intervention mean = 16.97 [SD = 3.74]; control mean = 15.63 [*SD* = 3.31]), and the mean social connectedness score at baseline was 51.55 (SD = 11.28, range = 31–76; intervention mean = 50.97 [SD = 12.47]; control mean = 53.73 [SD = 10.42]).

Seventy-eight participants provided data at Week 6, and 62 participants provided data at Week 10 (see Fig. 1). Where individual loneliness (UCLA) scores were missing across the Week 1–6 (but not baseline or Week 10) data from participants who provided preceding and subsequent scores, the *last observation carried forward* method was used to input a missing value. If there was a difference of two or more points to the next recorded value the mean value of the last and next observations was inserted. This affected the scores of 19 of the participants and allowed them to be included in the analyses. The total cohort reported a mean age of 35.39 years (median = 35, SD = 3.74, range 26–45 years) and had a median household gross income of £52,000 to £75,999. Participants lived in the United Kingdom, primarily in London and the south of England, were highly educated (93% having undertaken higher education), 67% were White and 76% were married or in a civil partnership. Sixteen percent of participants reported taking medication for mood, and 24% reported having talking therapy. Full demographic details are presented in Table 1.

Analysis

Baseline measures and demographics were compared between intervention and control groups using independent samples *t*-tests for continuous variables (age, number of children, EPDS, UCLA-3, SC-15) and Chi-squared tests for categorical variables (relationship status, use of medication, talking therapy, level of education, region, income). No significant differences were found; thus, covariates were not included in subsequent models. Factorial mixed

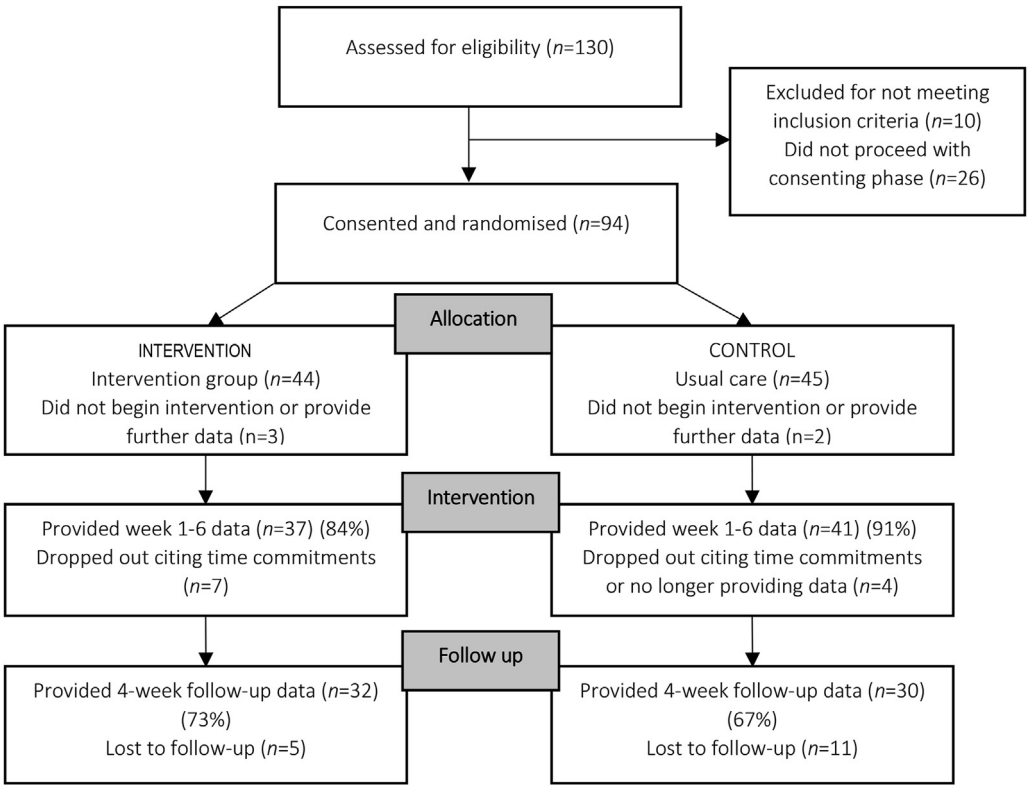

Fig. 1. Participant flowchart.

analyses of variance (ANOVAs) were conducted for each of the three outcome variables. Each ANOVA was followed by a custom planned contrast in which a repeated comparison was conducted within each of the control and intervention groups comparing baseline with Week 6 and Week 6 with Week 10, as well as comparisons of the intervention/control pairing at each time point. This resulted in seven total comparisons each for the EPDS and SC-15 and 12 comparisons for the UCLA-3. Effect sizes were calculated using partial eta squared. Tests of homogeneity and sphericity were conducted and, where the latter were violated, Greenhouse-Geisser corrections applied (indicated below). Analyses were conducted using JASP (v. 0.16.1).

Results

Hypothesis 1

A 2 × 8 mixed ANOVA was conducted comparing the intervention and control groups across baseline, Weeks 1–6 and the follow-up at Week 10 ($n = 62$ provided data at all time points; see Fig. 1). Sphericity was violated; thus, a Greenhouse-Geisser correction applied. A moderate and significant interaction effect between loneliness and treatment group was found ($F_{5.554,333.248} = 6.504$, $P < 0.001$, $\eta^2_P = 0.098$) in which loneliness scores were found to fall significantly lower within the intervention group compared with the control group, thus supporting the hypothesis. A large and significant main effect of time on loneliness was found ($F_{5.554,333.248} = 13.106$, $P < 0.001$, $\eta^2_P = 0.179$) in which loneliness scores fell overall (see Table 2 and Fig. 2). The main effect of treatment group was also significant with a moderate effect size ($F_{1,60} = 4.416$, $P < 0.05$, $\eta^2_P = 0.069$).

The planned custom contrasts revealed that group differences in loneliness scores first significantly differed following 3 weeks of the intervention, with the peak difference appearing at Week 4 after which differences stabilised (see Table 2 and Fig. 2). Both intervention and control groups saw significantly lower scores ($t = 8.500$, $P < 0.001$; $t = 2.235$, $P < 0.05$) at Week 6 compared with baseline, with the intervention group dropping a total 1.72 points on the 7-point scale (a 38% relative and 25% absolute drop) and the control group dropping 0.47 points (a 10% relative and 7% absolute drop), 0.40 of which fell between baseline and Week 1. No significant differences were seen between Week 6 and follow-up at Week 10.

Hypothesis 2

A 2 × 3 mixed ANOVA was conducted comparing the intervention and control groups across baseline, Week 6 and the follow-up at Week 10 ($n = 60$ provided data at all time points). Sphericity was violated; thus a Greenhouse-Geisser correction applied. A large and significant interaction effect between PND and treatment group was found ($F_{1.665,96.596} = 12.231$, $P < 0.001$, $\eta^2_P = 0.174$) in which PND scores were found to fall significantly lower within the intervention group compared with the control group, thus supporting the hypothesis. A large and significant main effect of time on PND was found ($F_{1.665,96.596} = 30.438$, $P < 0.001$, $\eta^2_P = 0.344$) in which PND scores fell overall (see Table 3 and Fig. 2). The main effect of treatment group was not significant.

The planned custom contrasts revealed that group differences in PND scores did not significantly differ at baseline but were significantly lower among the intervention group at Weeks 6 and 10 (see Table 3 and Fig. 2). Both intervention and control groups saw significantly lower scores ($t = 7.124$, $P < 0.001$; $t = 2.229$, $P < 0.05$) at Week 6 compared with baseline, with the intervention group dropping a total 5.44 points on the 31-point scale (a 32% relative and 18% absolute drop) and the control group dropping 1.70 points

Table 1
Participant demographics ($N = 89$).

Variable	Category	Count			Percent (of 44, 45, 89)		
		Int.	Control	Total	Int.	Control	Total
Number of children	1	28	23	51	64%	51%	57%
	2	12	21	33	27%	47%	37%
	3	3	1	4	7%	2%	5%
	4	1	0	1	2%	0%	1%
Relationship status	Single	8	6	14	18%	13%	16%
	Married/civil partnership	34	34	68	77%	76%	76%
	Separated/divorced	0	1	1	0%	2%	1%
	Prefer not to say	2	4	6	5%	9%	7%
Live with partner?	Yes	41	41	82	93%	91%	92%
Taking medication for mood?	No	38	35	73	86%	78%	82%
	Yes	4	10	14	9%	22%	16%
	Prefer not to say	2	0	2	5%	0%	2%
Having a talking therapy?	No	33	34	67	75%	76%	75%
	Yes	10	11	21	23%	24%	24%
	Prefer not to say	1	0	1	2%	0%	1%
Level of education/qualification	Secondary (e.g. high school)	2	3	5	5%	7%	6%
	Tertiary/higher/further	26	22	48	59%	49%	54%
	Advanced (e.g. masters, doctorate)	16	19	35	36%	42%	39%
	Prefer not to say	0	1	1	0%	2%	1%
Region	North England	5	10	15	11%	22%	17%
	London	27	19	46	61%	42%	51%
	South England	10	14	24	23%	31%	27%
	Scotland	2	2	4	5%	4%	5%
Household gross income	Up to £5199	1	0	1	2%	0%	1%
	£5200 and up to £10,399	0	1	1	0%	2%	1%
	£15,600 and up to £20,799	0	1	1	0%	2%	1%
	£20,800 and up to £25,999	0	2	2	0%	4%	2%
	£26,000 and up to £31,199	2	2	4	5%	4%	5%
	£31,200 and up to £36,399	0	1	1	0%	2%	1%
	£36,400 and up to £41,599	2	2	4	5%	4%	5%
	£41,600 and up to £46,799	3	4	7	7%	9%	8%
	£46,800 and up to £51,999	2	3	5	5%	7%	6%
	£52,000 and up to £75,999	11	10	21	25%	22%	24%
	£76,000 and above	13	12	25	30%	27%	28%
	Prefer not to say	10	7	17	23%	16%	19%
Ethnicity	Arab	1	0	1	2%	0%	1%
	Asian	2	5	7	5%	11%	8%
	Black	4	1	5	9%	2%	6%
	White	29	31	60	66%	69%	67%
	Mixed	5	6	11	11%	13%	12%
	Other	3	1	4	7%	2%	5%
	Prefer not to say	0	1	1	0%	2%	1%

(an 11% relative and 5% absolute drop). No significant differences were seen between Week 6 and follow-up at Week 10 in either group.

Table 2
Descriptives and pairwise comparisons for the Loneliness (UCLA-3) scores.

Loneliness (UCLA-3)	Treatment	Mean	SD	Difference	t	P
Baseline	Control	7.30	1.29	0.23	0.659	0.511
	Intervention	7.53	1.24			
Week 1	Control	6.90	1.40	0.07	0.196	0.845
	Intervention	6.97	1.36			
Week 2	Control	7.00	1.29	−0.38	−1.069	0.287
	Intervention	6.63	1.31			
Week 3	Control	7.10	1.24	**−0.82**	**−2.334**	**0.021**
	Intervention	6.28	1.35			
Week 4	Control	7.00	1.49	**−1.09**	**−3.119**	**0.002**
	Intervention	5.91	1.42			
Week 5	Control	6.93	1.26	**−0.90**	**−2.572**	**0.011**
	Intervention	6.03	1.35			
Week 6	Control	6.83	1.46	**−1.02**	**−2.911**	**0.004**
	Intervention	5.81	1.80			
Week 10	Control	6.83	1.32	**−1.02**	**−2.911**	**0.004**
	Intervention	5.81	1.38			

EPDS, Edinburgh Postnatal Depression Scale; SD, standard deviation. Figures in bold indicate significance at $P < 0.05$.

Hypothesis 3

A 2 × 3 mixed ANOVA was conducted comparing the intervention and control groups across baseline, Week 6 and the follow-up at Week 10 ($n = 59$ provided data at all time points). A large and significant interaction effect between social connectedness and treatment group was found ($F_{2,114} = 11.949$, $P < 0.001$, $\eta^2_P = 0.173$) in which social connectedness scores were found to rise significantly higher within the intervention group compared with the control group, thus supporting the hypothesis. No significant main effects of social connectedness or treatment group were seen (see Table 3 and Fig. 2).

The planned custom contrasts revealed that group differences in social connectedness scores did not significantly differ at baseline or at Week 6 but were significantly higher among the intervention group at Week 10 (see Table 3 and Fig. 2). Only the intervention group saw a significant difference in scores ($t = -3.685$, $P < 0.001$) at Week 6 compared with baseline, with the intervention group increasing by 5.20 points on the 76-point scale (a 14% relative and 7% absolute increase). No significant differences were seen between Week 6 and follow-up at Week 10 in either group.

To confirm general effects with a larger sample, mixed ANOVAs were conducted among the participants ($n = 78$ UCLA; $n = 76$ EPDS; $n = 75$ SC-15) who had provided baseline and Week 1–6 data only.

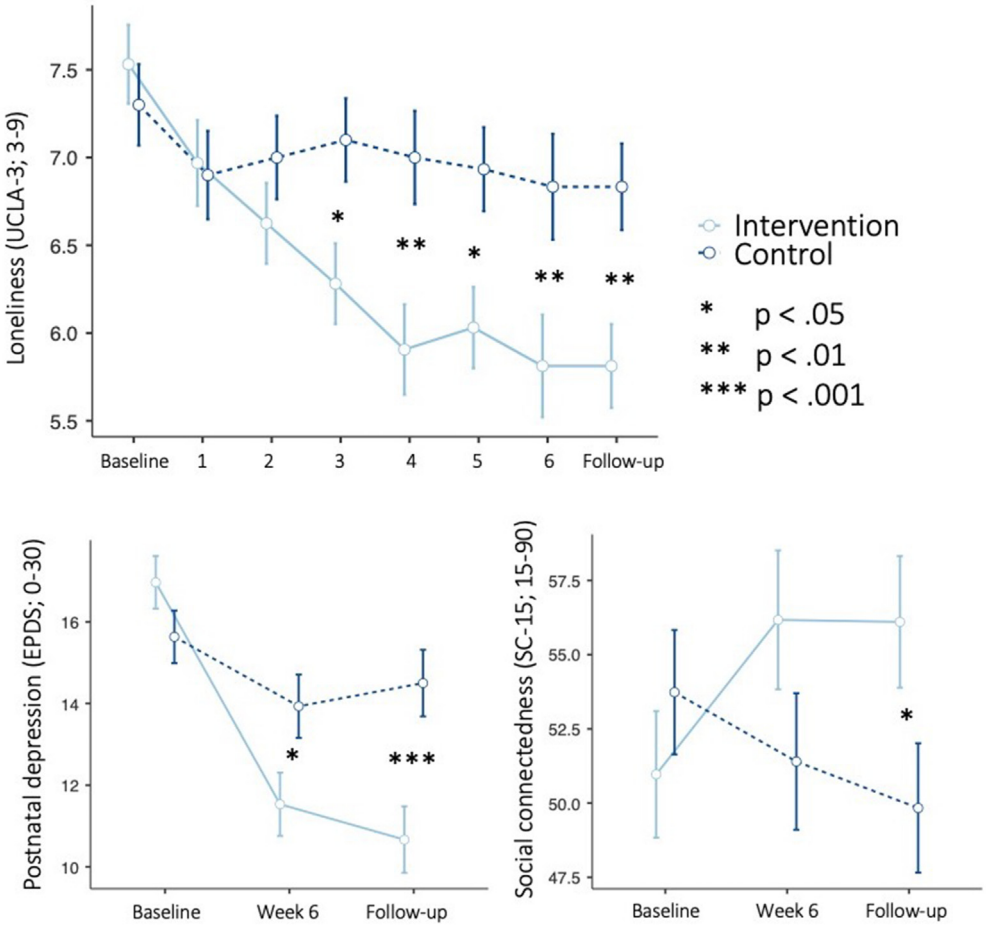

Fig. 2. Differences between intervention and control groups on the three outcome variables (error bars show ±1 standard error).

No differences in descriptive trends or the significance or size of main, interaction, or contrast effects were observed that would alter the above interpretations of the hypotheses.

Discussion

All three hypotheses were supported by the data with moderate-to-large effects. These findings provide evidence that an online songwriting intervention can reduce postnatal loneliness. They reinforce existing evidence that music can reduce loneliness[36] and support social connectedness[30] as well as support perceived mother–infant closeness[24] and bonding.[37]

As illustrated in Fig. 2, the intervention and control group significantly deviated in loneliness scores at Week 3 of the intervention, with the difference peaking at Week 4 and then stabilising through until follow-up. It is possible that the drop in loneliness seen in the control group between baseline and Week 1 was an effect of being part of a research project and contributing to a sense of 'sisterhood' that has been identified in other research.[38] In the intervention group, the beneficial effect on loneliness was maintained for at least the 4-week follow-up period. It should be noted that loneliness scores remained relatively high in the intervention group (mean 5.81) although, importantly, postintervention scores dropped below the cutoff of 6 identified in other research as indicative of being lonely.[39] The intervention also increased social connectedness scores, suggesting that participants also experienced feeling more connected to others, an important 'opposite of loneliness',[7] although the effect on social connectedness was weaker than that for loneliness and PND and took longer to appear.

Alongside these effects, the intervention reduced symptoms of PND among participants in the intervention group. In this group, EPDS scores had reduced to below the cutoff of 12/13 suggested for 'major' depression[40] by the end of the 6-week songwriting programme and reduced further by follow-up. This lends support to existing research showing that a group singing intervention can speed up recovery from moderate–severe symptoms of PND[22] and

Table 3
Descriptives and pairwise comparisons for the PND (EPDS) and Social Connectedness (SC-15) scores.

Outcome	Treatment	Mean	SD	Difference	*t*	*P*
PND						
Baseline	Control	15.63	3.31	1.34	1.261	0.210
	Intervention	16.97	3.74			
Week 6	Control	13.93	3.72	**−2.40**	**−2.270**	**0.025**
	Intervention	11.53	4.70			
Week 10	Control	14.50	4.69	**−3.83**	**−3.626**	**<0.001**
	Intervention	10.67	4.21			
Social connectedness						
Baseline	Control	53.73	10.42	−2.76	−0.885	0.379
	Intervention	50.97	12.47			
Week 6	Control	51.40	11.08	4.77	1.526	0.131
	Intervention	56.17	14.00			
Week 10	Control	49.83	9.74	**6.27**	**2.005**	**0.049**
	Intervention	56.10	13.85			

EPDS, Edinburgh Postnatal Depression Scale; PND, postnatal depression; SD, standard deviation. Figures in bold indicate significance at $P < 0.05$.

more widely that music can support perinatal mental health.[41] Looking across the outcome measures in this study, we know that higher loneliness is associated with more severe mental health symptoms[42] and that there is some evidence that greater loneliness predicts poorer depression outcome.[18] It is possible that a two-way effect may operate with songwriting, whereby the intervention increases social connectedness and reduces loneliness (risk factors for PND[13]), thereby helping to reduce symptoms of PND, and/or the intervention reduces symptoms of PND and therefore reduces the loneliness that people with this illness have reported.[14]

This RCT was not blinded, given the participatory nature of the intervention. It also relied on self-reports of primary and secondary outcomes. It is therefore possible that effects were driven by some combination of acquiescence bias and researcher effects, although the consistency of follow-up scores suggests a degree of internal validity. Of note is also the relatively large number of participants lost to drop out ($n = 11$ during the intervention and a further $n = 16$ lost at follow-up, see Fig. 1). When reported, dropout reasons included time commitments and scheduling conflicts. It is possible that the online mode of delivery also influenced attrition rates, with participants reporting varying views on the acceptability and desirability of songwriting online.[32] Research at the start of the COVID-19 pandemic (May 2020) revealed that people engaged in virtual music groups reported significantly lower group identification and psychological needs satisfaction than people in face-to-face music groups, although scores remained high in both groups.[43] Other studies have also recognised the complexity of online music provision, which is likely to have both benefits and limitations.[44,45] Finally, the research is limited by the lack of diversity in some aspects of the sample; most participants lived in London or the South of England, were highly educated and had relatively high household income.

Future research replicating this trial with a larger and more diverse sample, including fathers and partners, will be important. Although the online setting offers some advantages in terms of accessibility, workshop leaders reported some participants experiencing discomfort when working creatively online on the sensitive topic of parenthood. Additional research is needed to investigate the acceptability of online songwriting for this population and to scrutinise whether there are differences in effects when comparing online with in-person settings. Finally, future research is needed to investigate the mechanisms behind the effects reported here, including qualitative work to capture experiences and perceptions of the intervention in relation to mental health.

Conclusions

This study demonstrates that a 6-week online songwriting intervention for women with young babies can reduce loneliness and symptoms of PND and increase social connectedness. Given that loneliness detrimentally affects both physical and mental health[18] and that PND can lead to lasting adverse parent and child outcomes,[46] the results of this study may have relevance for the management of postnatal loneliness and PND.

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Ethical approval

All procedures involving human participants were approved by the Conservatoires UK Research Ethics Committee on 5 March 2021 [CUK/RCCSD/2020-21/5] and amended on 2 August 2021 [CUK/SF/2020-21/5/2]. Written informed consent was obtained online from all participants.

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Data availability

The dataset for the outcome measures is freely available at https://doi.org/10.24379/RCM.00002326.

Competing interests

The authors declare that they have no competing interests.

Author contributions

R.P. formulated the research question, designed and carried out the study and led the writing of the article. N.S. formulated the research question, designed and carried out the study and wrote the article. G.W. formulated the research question, designed and carried out the study, conducted the analyses and wrote the article.

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