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Lockdown music listening: A mixed methods, multinational study exploring social uses of music listening and anxiety during social distancing in the first wave of COVID-19

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Abstract

Objective: The social distancing and isolation measures used to minimise the spread of COVID-19 have negatively impacted anxiety levels. It has been demonstrated that music listening can help reduce anxiety and the current pandemic has called for an examination of the extent to which music listening may be important when social interaction is limited.
Method: An online mixed methods survey involving both Likert scale and open-ended questions was conducted to understand the associations between anxiety, music use and social uses of music listening during the pandemic. A total of 196 participants from 24 countries completed the survey between July and August 2020.
Results: Anxiety appeared significantly heightened in those who rated music as more important to them during the pandemic compared to before. Qualitative content analysis confirmed the ubiquitous nature of music in everyday life. Affect regulation was a prominent function of music listening in the data, which is in line with previous research. The majority of shared music listening experiences evoked positivity, connectedness and provided a sense of normality for listeners.
Conclusions: The accessibility and feasibility of music listening interventions during social isolation aligns with research priorities for interventions to target the psychological distress caused by the pandemic.

Keywords: Music Listening, Anxiety, Coronavirus outbreak, Social music listening.

1. Introduction

Music listening is an intervention that has shown to be successful in alleviating short-term anxiety (Harney et al., 2022; de Witte et al., 2019). It involves listening to pre-recorded or live music, either alone or with other people. The benefits of music listening are that it is accessible, inexpensive and can be self-administered. It does not require a trained therapist or health care professional. Music listening has been shown to reduce anxiety in a number of meta-analyses (Harney et al., 2022; Panteleeva et al.,

2017; Pelletier, 2004; de Witte et al., 2019). However, research into the role of music listening since the COVID-19 outbreak began, and how it may offer relief to those experiencing heightened anxiety, is still emerging.

The COVID-19 pandemic is continuing to have negative consequences on mental health. The pandemic has impacted anxiety levels negatively, with researchers fearing serious and prolonged impacts on mental health (Cullen et al., 2020; Holmes et al., 2020; Pfefferbaum & North, 2020). For those already experiencing mental health concerns, it is expected that these issues will worsen (Holmes et al., 2020). A heightened prevalence of anxiety was found in a recent meta-analysis of 17 studies, with a prevalence of 31.9% in Europe and Asia (Salari et al., 2020). In the UK, moderate to severe anxiety was shown at a prevalence of 22% in March 2020 (Fancourt et al., 2021). This was even higher at 54% for those with a pre-existing diagnosed mental illness (Fancourt et al., 2021). This is higher than the 5.9% prevalence in a pre-pandemic normative sample (Hinz et al., 2017). Increased levels of anxiety can decrease immune system function, which may elevate the risk of contracting viruses (WHO, 2020). Additionally, the lockdown measures enforced by many countries have impacted anxiety levels with minimised psychosocial support and limited access to mental health services (Brooks et al., 2020; Fancourt et al., 2021; Holmes et al., 2020). By understanding how people were using music during a period of significant social distancing, we can gain a sense of whether music listening can be used as an effective intervention during times of social isolation and increased anxiety.

The literature concerning the therapeutic functions of music listening is heterogeneous. In part, this may be explained through the complex interplay of both situational and individual influences on the music listening experience (Greb et al., 2018). Some challenges faced in the research area are the interchangeable use of terminology surrounding mood and emotion, and also how functions and outcomes of music listening are described (Balthazar & Saarikallio, 2016; Groarke & Hogan, 2018). Several researchers have attempted to summarise the impact of music through models of emotion induction (BRECVEMA; Juslin 2013), mood (Music in Mood Regulation Scale (MMR); Saarkallio, 2008) and wellbeing (Adaptive Functions of Music Listening (AFML), Groarke & Hogan, 2016). The AFML highlights the social, affective and cognitive functions of music listening in relation to wellbeing (Groarke & Hogan, 2016). Drawing upon these models and the associated literature, it appears there are several avenues by which music could be used therapeutically to regulate anxiety.

Firstly, it has been posited that psychological disorders such as anxiety are the consequence of unsuccessful affect regulation strategies (Campbell-Sills & Barlow, 2007; Miranda et al., 2012). Affect regulation involves the up or down regulation of emotion or mood and is frequently conveyed as a key function of music listening (Saarikallio, 2012; Schäfer et al., 2013). Music listening is a method of self-regulation that can be conscious or unconscious, as well as adaptive and maladaptive, allowing listeners to reach specific emotional goals (Randall et al., 2014). This is in line with the uses and gratifications theory (Katz et al., 1974; Lonsdale & North, 2011) which proposes that individuals use media, such as music, to fulfil a goal or need. One study showed an increased use of music for emotion regulation by those experiencing negative mood and anxiety (Randall & Rickard, 2017). When used positively, music listening can support coping by reducing and preventing symptoms of anxiety through providing an opportunity to deal with negative emotions in a non-threatening environment (Miranda, 2012). Higher scores in affect regulation in the AFML scale have been associated with higher positive affect and life satisfaction, however not lower negative affect (Groarke & Hogan, 2018).

In Saarkallio's MMR (2008) scale, the function of releasing negative emotions through music is referred to as *Discharge*. Research shows that the use of music in this way correlates with experiences of higher anxiety and stress (Carlson et al., 2015; Thomson et al., 2014), which could indicate the purposeful use of music to alleviate symptoms. However, it has been suggested that there is a risk of rumination when engaging in this function (Thomson et al., 2014). Rumination or further downregulation of negative affect could worsen symptoms of anxiety and be deemed maladaptive (Garrido & Schubert, 2013). Using music for rumination has been linked to reduced psychological, subjective and social wellbeing and was

found to be more common in women (Groarke & Hogan, 2018). This highlights the individual differences in coping strategies associated with music listening.

Anxiety is a stress-related disorder (Pulopulos et al., 2020). A typical symptom of anxiety is hyperarousal, indicated through increased heart rate and blood pressure. Music listening has shown effects on physiological indicators of anxiety in two meta-analyses, including decreased cortisol, heart rate and blood pressure (Finn & Fancourt 2018; de Witte et al., 2020). Contrastingly, one review found no significant effect on physiological measures, however the review only included studies in which anxiety was a primary outcome measure, so is arguably narrow in scope (Panteleeva et al., 2018). A key function of music listening as stated in the literature is the link with arousal and energy regulation (Schäfer et al., 2013). A meta-analysis of 22 studies showed a significant decrease in arousal after music listening with a medium effect (d = .67; Pelletier, 2004).

In addition, certain cognitive functions associated with music listening may be drawn upon to explain its anxiety alleviating effects. Cognitive function refers to the various mental functions in action when listening to music (for example, eliciting episodic memories, mental travel and attention). Cognitive functions *Mental Work* and *Diversion* (from the MMR scale, Saarikallio (2008)) are positively associated with the emotional regulation strategy of reappraisal (Saarikallio, 2012). Another hypothesized mechanism in eliciting an emotional response in music listeners is through evoking episodic memories (from Juslin's (2013) BRECVEMA model). Nostalgia, which is linked to recalling positive memories as well as yearning for the past, is another example of a cognitive function of music listening (Garrido, 2018; Gibbs and Eggerman., 2021). The use of music to evoke nostalgia has been shown to relate to both adaptive and maladaptive coping and is influenced by personality and rumination (Garrido, 2018). Conversely, participants who stated their reason for music listening was to 'forget' have shown positive correlations with anxiety (Randall & Rickard, 2017).

Anxiety disorders have been associated with lower psychosocial functioning (Miranda et al., 2012; Rodriguez et al., 2005). The impact this may have on social behaviours associated with music listening during the pandemic could be predicted to occur in one of two possible ways. Firstly, individuals experiencing heightened anxiety may engage in less music listening with others. Past research has indicated that music for emotional purposes (such as to alter negative mood) is self-focusing, and thus conducive to individual music listening rather than listening with others (Randall & Rickard, 2017). In addition, the social surrogacy hypothesis suggests music listening may provide some comforting company even without the presence of others (Schäfer & Eerola, 2020). However, music may provide a helpful tool in engaging with others socially when experiencing psychosocial difficulties associated with heightened anxiety. Communication is one of the main social functions of music listening and is key to forming and continuing social networks (MacDonald, 2021; Schäfer et al., 2013). Music can enhance wellbeing through fostering a sense of community. One way of doing this is through sharing music with others. Social music listening as a form of loneliness regulation has been linked to higher positive affect in research by Groarke and Hogan (2018), however this relationship was small and warrants further exploration. At the height of the pandemic in March 2020, it was reported that people were creating more playlists together and sharing more music on social media (Spotify, 2020). Sharing music with others has been linked to improved wellbeing in adolescents (Papinczak et al., 2015). However, it is still not fully understood how engaging in music listening with others may link to anxiety during a time of social isolation in the first wave of the COVID-19 pandemic.

We investigated the following exploratory research questions:

1) Did amount of music listening and importance of music listening change during the pandemic, and if so, how did it relate to anxiety during the pandemic?

2) Did people engage in music listening-related social behaviours (e.g., sharing music with others, creating playlists with others), and if so, how did such behaviour relate to anxiety during the pandemic?

2. Methods

2.1. Participants

Participants were recruited through Prolific (www.prolific.co) and social media in July 2020. The incentive for participants recruited via prolific was £2.50, in accordance with the website guidelines. For those recruited via social media, participants were entered into a prize draw to win £30 in vouchers. Requirements for participation included being 18 years of age or over and being able to understand English. Ethical approval was obtained by the School of Psychology ethics committee at the University of Leeds (Approval code: PSYC-63, 06/06/2020).

2.2. Questionnaire overview

The mixed methods questionnaire comprised four sections. Firstly, there was a section collecting demographic information, which also included questions such as living arrangement and occupation status. This was followed by the GAD -7 measure of anxiety. Next was a section on music listening habits during the pandemic, which involved a combination of Likert scales and open-ended questions. The questions required participants to reflect on the amount of music listening and perceived importance of music listening during the pandemic. The open-ended questions focused on exploring the reasons why individuals were engaging with music. There were also questions surrounding social behaviours associated with music listening, such as listening to music with others and creating playlists with others.

2.3. Music listening habits

Participants were asked a series of questions about their music listening habits during the first wave of the COVID-19 pandemic, from March 2020. This involved 7-point Likert scales to measure if participants' amount of music listening had changed since the pandemic began and if the perceived importance of music had changed for them over this period (1 = *moderately lower*, 7 = *moderately higher*).

2.4. Anxiety and mood measures

Current anxiety levels were measured through the GAD-7 questionnaire (Spitzer et al., 2006). This measure has been consistently supported as a strong measure of generalised anxiety disorder both in the general population and primary care settings (Löwe et al., 2008; Rutter & Brown, 2017). Additionally, it was recently used in a COVID-19 UK based national survey, which allowed for direct comparisons to be made (Fancourt et al., 2021).

In order to explore the relationship between music listening and anxiety in more detail and advance upon the quantitative analysis, we asked the following open-ended question, 'Can you recall a time since the beginning of the Coronavirus outbreak when you felt anxious? Was there music involved in this experience? If so, please recall the experience below.'

2.5. Social music listening

Participants were asked if certain social behaviours associated with music listening (sharing music with others, creating playlists with others) had changed since the onset of the pandemic, compared to before, using 7-point Likert scales (1 = *moderately lower*, 7 = *moderately higher*). To understand participants' experiences of listening to music with others during the pandemic, we asked an open-ended question stating, 'Recall a time when you listened to music with others since the outbreak began. Can you describe that experience? How would you say that experience made you feel?'

2.6. Procedure

After expressing interest in the study, participants were provided with a link to the questionnaire in Qualtrics. This first section comprised an information sheet, followed by a consent form. This was followed by the questionnaire, which took approximately 20 minutes to complete. Participants were then shown the debrief page which included signposts for support, if required. Participants were either then linked back to Prolific or to a separate webpage to enter their email address for the prize draw, if recruited through social media.

2.7. Data analysis

Four one-way ANOVAs were conducted to assess how changes in music listening (ML amount and ML importance) and social behaviours associated with music listening (share ML with others and create playlists with others) related to anxiety. Likert scales were collapsed into three levels (i.e., less, same or more) and GAD-7 scores were compared between these three responses. Due to unequal sample sizes, Hochberg GT2 post hoc tests were used to assess differences between each group.

For the two open-ended questions, qualitative content analysis (QCA) was performed, and researchers followed an inductive approach. This process involved a data driven method to analysis with a focus on phenomenological descriptions and analysis of manifest content (Graneheim et al., 2017; Hsieh & Shannon, 2005). This process involved the first author initially becoming familiar with the data, followed by assigning initial codes to participant responses. Codes were then reviewed with commonalities and differences explored. Finally, themes and sub-themes emerging from the data were formulated. The data were independently analysed by a second author (JH) and discussed before proceeding with final themes.

3. Results

A total of 196 participants from 24 countries responded to the survey. The mean age of participants was 30.83 (*SD* = 11.18) with an age range of 18-66 years. There were 122 participants who identified as female, 78 males, and three participants who did not disclose their gender. A full summary of all demographic information can be found in Appendix A.

Research Question 1: Did engagement with music (amount of ML and importance of ML) change during the pandemic, and if so, how did it relate to anxiety during the pandemic?

A total of 93 participants stated that their music listening had increased during the pandemic compared to before, 67 stated that this behaviour had stayed the same and 36 said their music listening had decreased**.** In terms of music listening importance, 110 participants stated that the importance of music had stayed the same, 70 perceived music as being of greater importance and 16 responded that they perceived the importance of music to be of lesser importance.

A one-way ANOVA showed no differences in GAD-7 scores when comparing levels of change in music listening amount relative to before the pandemic (lower, same, higher), F (2, 193) = 1.84, p = .162. However, for music listening importance (Less, same, greater importance), a one-way ANOVA showed a significant difference between groups, F (2, 193) = 7.53, p = .001. Hochberg GT2 post hoc tests demonstrated a significantly higher ($p < .001$) anxiety score for those who reported music listening to be more important compared to those who found it to be of the same importance. This indicates that those who reported music as being more important to them were experiencing heightened anxiety compared to those who rated music listening as of similar importance. Means and standard deviations of GAD-7 across groups are presented in Table 1.

Table 1. Summary of one-way ANOVAs and group comparison in GAD-7 scores for Music Listening (ML) amount and importance.

				df	*df*	*F*	*p*
ML Amount				2	193	1.84	*p* = .162
	GAD-7 Mean (*SD*)	*n*	Mean difference				
			1	2	3		
1. Less ML	6.83 (4.82)	36	-	0.68	0.82		
2. Same ML	6.15 (4.92)	67	0.68	-	1.51		
3.More ML	7.66 (4.99)	93	0.82	1.51	-		

				df	*df*	*F*	*p*
ML importance				2	193	7.53	*p* = .001
	GAD-7 Mean (*SD*)	*n*	Mean difference				
			1	2	3		
1.Less importance	6.63 (4.75)	16	-	0.71	2.13		
2. Same importance	5.92 (4.56)	110	0.71	-	2.84***		
3. Greater importance	8.76 (5.17)	70	2.13	2.84***	-		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

3.1. Qualitative content analysis: music listening and anxiety

A total of 154 participants (79%) said they could recall an anxious experience from during the pandemic. When asked if music was involved in this experience, 20 participants (13%) did not provide a response and a further 94 participants (61%) said that no music was involved. The remaining 40 responses (26%) were analysed, and three key themes emerged from the data.

3.2. Theme 1: Music for affect regulation

Of the 40 participants describing an experience involving music, 24 people (60%) said music listening was used to improve mood or feel better during this experience. For example, one participant said, *'I felt anxious, so I listened to music to feel better'.* In addition to this, the calming effects of music listening were seen regularly throughout the data, with 10 participants (25%) referring to this, '*Yes, I made the most of listening to calming songs in times of heightened anxiety'*. Some participants mentioned specific types of music that they used to improve their mood, *'...I had to listen to ethereal remixes of classical music on YouTube to calm myself down and reconnect myself with reality and simple auditory sensations'.* Some participants mentioned the use of music as an escape or distraction, for example, '*There was music to help me calm down and take my mind off the worry'.* Additionally, one participant said the use of nostalgic music helped. For example, '*Nostalgic music helped ease anxiety'.*

3.3. Theme 2: Music and negative affect

Six participants (15%) stated that the music involved in this anxious experience had a negative impact on anxiety. For example, '*loud music now gives me anxiety, that didn`t happen before lockdown',* and *'Yes Rock music, it makes me anxious'.* In addition, three participants (7%) stated they listened to more sad or emotional music during this time.

3.4. Theme 3: Music in the background

A further two participants (5%) were listening to music when experiencing anxiety, but this was not related to their anxious state, *'I got anxious because of some problems at work, there was music involved because I'm always listening to music.'*

Research Question 2: Did people engage in social behaviours (e.g., sharing music with others, creating playlists with others) whilst listening to music, and if so, how does such behaviour relate to anxiety during the pandemic?

A total of 109 participants responded that they shared the same amount of music listening with others during the first wave of the pandemic. This was followed by 48 participants who said they shared more music. Thirty-nine participants shared less music with others during the pandemic. In terms of creating playlists with others, 113 participants said this amount stayed the same. Twenty-seven participants stated that they created fewer playlists with others and 15 responded that they created more playlists with others.

Participants' Likert responses were categorized into three groups: fewer, same or more. Two one-way ANOVAs were conducted to compare the differences in anxiety scores across groups. For sharing music listening with others, there was a trend towards significance when comparing GAD-7 scores across groups, $F(2, 193) = 2.77$, $p = .065$. Additionally, there were no differences in GAD-7 scores when comparing number of playlists created with others, $F(2, 193) = 1.63$, $p = .199$. Table 2 presents the means and SDs for GAD-7 across groups.

Table 2. Summary of one-way ANOVAs and group comparison of GAD-7 scores across social variables (Music Listening (ML) shared with others and playlists created with others).

				df	*df*	*F*	*p*
ML shared				2	193	2.77	$p = .065$
	GAD-7 Mean (SD)	*n*	Mean difference				
			1	2	3		
1. Less	6.64 (4.59)	39	-	0.16	1.79		
2. Same	6.48 (4.91)	109	0.16	-	1.96		
3. More	8.43 (5.18)	48	1.79	1.96	-		
				df	*df*	*F*	*p*
Playlist amount				2	152	1.63	$p = .199$
	GAD-7 Mean (SD)	*n*	Mean difference				
			1	2	3		
1.Fewer playlists created	5.78 (4.00)	27	-	1.18	2.89		
2. Same playlists created	6.96 (5.19)	113	1.18	-	1.71		
3. More playlists created	8.67 (4.97)	15	2.89	1.71	-		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

3.5. Qualitative content analysis: shared music listening experiences

When asked to describe their experiences of listening to music with others, 84 participants (43%) did not provide a response, suggesting that they did not listen to music with others during this time, or that they decided not to answer. The remaining 112 participants' (57%) responses were analysed. A total of 34 participants (30%) described the experience by stating the people who were part of it. In addition, 43 participants (38%) described the experience by social context. This is summarised in Table 3.

Table 3. Summary of descriptors used when asked about an experience of music listening with others.

Descriptor of shared listening experience	***n* (%)**
With partner	16 (14%)
With family	11 (10%)
With friends	6 (5%)
With flatmates	1 (1%)
Descriptor of context	***n* (%)**
Online	23 (21%)
Party	6 (4%)
Radio	4 (4%)
Kitchen	3 (3%)
Work	3 (3%)
Concert	2 (2%)
Car	1 (1%)
Holiday	1(1%)

When asked to describe how this shared music listening experience made them feel, participant responses fell into five themes which are summarised in Table 4.

Table 4. Themes describing experiences of shared ML with indicative quotes.

Theme (% cases)	Description	Examples
Positive (68%)	Participants stated that this experience was positive with 12% of participants referring to this experience as relaxing.	*'It made me feel better'*, *'Very happy'* *'Fun and exciting'* *'Relaxed, comfortable and chilled'*
Connected (10%)	Participants mentioned this experience made them feel more connected. This shared experience made some participants feel less alone.	*'It made me feel happy and closer to her now that we are in different cities because of covid'* *'It instantly boosted my mood and made me feel less isolated as we were sharing the experience at the same time'*
Sense of normality (4%)	Participants said this experience reminded them of times before the pandemic and this evoked a sense of nostalgia 3% and normality.	*'Very good!! I needed to feel I was with friends doing "normal" stuff like listening to music'* *'Feel like old times'* *'Maybe happier like how it used to be'*
Negative (3%)	One participant explained that this experience was negative because they didn't like the music. In addition, 2 participants stated the experience evoked irritation.	*'Not really my kind of music and I couldn't hear it very well, so it was kind of crap'*
Neutral (3%)	This experience was viewed as neutral or involved no specific emotions for some participants.	'N*eutral*' *'It didn't change anything'*

4. Discussion

The aim of the current research was to explore engagement and social behaviours associated with music listening, and how they related to anxiety during the first wave of the COVID-19 pandemic. Results from 196 participants across 24 countries showed that those who reported music listening to have become more important to them since the onset of the pandemic also reported significantly higher levels of anxiety. There were no significant differences between different levels of anxiety and changes in amount of music listening. In addition, there were no significant differences between different levels of anxiety and social music listening behaviours although, there was an overall trend for those reporting higher levels of anxiety to also report increases in their music engagement. Qualitative content analysis provided a more detailed account of the role music listening played during the pandemic. When asked

about the role music played during an anxious episode, most participants reported *affect regulation* when listening to music which included improved mood. When asked how social music listening experiences made participants feel, most participants stated this shared experience was positive, with reports of emotions such as *relaxation*, *connection* as well as a *sense of normality* which was linked to nostalgia.

It appears that participants were using music listening to *regulate affect* (i.e., to feel better or improve their mood) during the pandemic. This could highlight conscious adaptive use of music listening, in line with the uses and gratifications model (Katz et al., 1974; Lonsdale & North, 2011). This is in line with a similar survey study conducted by Carlson et al. (2021) who asked participants to share their music listening habits during the first wave of the COVID-19 pandemic in free text format. Content analyses derived a theme in their study of *creating and maintaining* affective states through music listening, which is in line with our findings.

A small number of participants suggested that music listening was linked to *negative affect*. Additionally, for a minority of participants, *music was in the background* and unrelated to the anxious episode. This highlights the individual differences associated with music listening and the salient role of music in some situations, which has been seen in previous research (e.g., Greasley & Lamont, 2011) and highlights the difference between hearing music and more focused music listening. This distinction is important when considering use of music listening as a therapeutic intervention. Additionally, it may be that some participants were engaging in maladaptive music listening, such as to ruminate, which exacerbated anxiety levels. Rumination when listening to music has been associated with lower psychological wellbeing (Groake & Hogan, 2018). Negative outcomes were also found in Carlson et al. (2021) which were linked to a higher score on the Beck Anxiety Inventory (Beck et al., 1988). However, there were insufficient examples of negative affect in the current study to statistically test the relationship with the anxiety score.

There were no significant differences between different levels of anxiety and changes in social music listening behaviours. Our data demonstrated that the majority of our participants were sharing the same amount of music and creating the same number of playlists with others during the pandemic, compared to before. Existing research regarding the role of social context in music listening for anxiety is still emerging. Increased wellbeing when sharing music with others has been found in adolescents (Papinczak et al., 2015). In addition, it has been found that listening to music with relatives or friends has been linked to positive emotions (Boer & Abubakar, 2014). It was suggested that this relationship could be bi-directional, in that people experiencing positive emotions may be more likely to listen to music with others. Qualitative accounts in the current study showed that participants felt *positive, connected* and a *sense of normality* when engaging in social music listening. This *sense of normality* was associated with nostalgia in the open text data. Gibbs et al., (2021) assessed music evoked nostalgia as a tool for regulating emotions during the pandemic and found positive links with wellbeing. However, research assessing music evoked nostalgia on wellbeing when engaging in individual or private and social music listening is yet to be fully explored.

It is important to note that some researchers have suggested that music listening for emotional regulation is a self-focusing activity (Randall & Rickard, 2017). In addition, at a time when social interaction is limited, ML may be used as a replacement for human contact. The social surrogacy hypothesis suggests that certain non-human entities provide temporary fulfilment for connection, consolation and a means of coping with loneliness (Gabriel et al., 2017). As social isolation was encouraged to minimise the spread of the virus, it may be that individuals were seeking social effects from music, referred to as the social surrogacy hypothesis (Schäfer & Eerola, 2020). Empirical research examining social behaviours associated with music listening to modulate anxiety is in need of further development.

5. Strengths and limitations

The invitation to provide qualitative responses as well as the collection of quantitative data allowed researchers to explore some of the reasons why individuals engaged in music listening behaviours, which is a key strength of the research. In addition, we were able to recruit participants from 24 countries, which provided wider scope than focusing on a sample from one population. However, this does mean that understanding the different lockdown restrictions (and thus limits to social contact) at the point of data collection is an important point to consider when interpreting findings.

The study design relied on conscious retrospective accounts from participants. Research suggests that the use of music for self-regulation can be both conscious and unconscious (Miranda et al., 2012). Asking participants to reflect across a time frame of approximately four months (from the start of the pandemic to the point of data collection) relied not only on participants having a conscious understanding of how they use music listening but also to reflect across a considerable period of time. We measured only self-perceived change in music listening amount and music listening importance, compared to before the outbreak and not respondents' normal amount of music listening or importance of music listening. By also asking for participants' general experience pre-pandemic, this may have provided a clearer indicator of musical engagement rather than a reliance on participants' ratings of change. The use of experience sampling methods (ESM; Csikszentmihalyi & LeFevre, 1989) may help to fill in the gaps here. Experience sampling methods have been used a number of times in music listening research (see Randall & Rickard, 2017) and more recently since the start of the pandemic (for example, see Cho & Ilari, 2021).

6. Implications

The accessibility and feasibility of music listening during social isolation aligns with research priorities for interventions to target the psychological distress caused by the pandemic (Holmes et al., 2020). The current findings can inform future research into the therapeutic use of music during times of social isolation, or increased anxiety. One benefit of music listening as an intervention is that it can be tailored to an individual's needs and goals (Lonsdale & North, 2011). Alongside the use of music for adaptive self-regulation, there can be some instances where music listening is maladaptive (Miranda et al., 2012). Although we cannot infer whether participants were actively using music to regulate their affect, it was clear that there were both positive and negative experiences of music listening linked with anxiety.

It would be interesting to pursue research into music listening as a social surrogate (Schäfer & Eerola, 2018) in terms of its potential to fill a social void and thereby influence anxiety, as well as broader mental health outcomes. The findings highlight the importance of understanding the circumstances in which people are listening to music such as setting and social context (Greb et al., 2018). Future research may focus on testing underlying mechanisms involved in music listening for anxiety reduction, such as emotional regulation through the MMR (Saarikallio, 2008) or the AFML (Groarke & Hogan, 2015).

7. Conclusion

In sum, this exploratory study assessed engagement with music listening, social music listening and anxiety during the first wave of the COVID-19 pandemic. The study highlighted the complex interplay between individual and situational factors on the use of music during lockdown restrictions. It confirmed the potential for music listening as a tool for emotion regulation. The results showed that those who perceived music to be of greater importance during the first wave of the pandemic were also experiencing heightened levels of GAD-7 anxiety compared to those who viewed music to be of the same importance. Qualitative analyses demonstrated that social music listening was a positive experience for most participants, allowing them to feel connected and a sense of normality. This highlights the potential social use of music listening as a coping strategy and its potential for future use in times of social isolation.

Understanding the role of music listening during this time can help us to identify key factors for future therapeutic interventions such as encouraging adaptive uses of music listening during times of heightened anxiety or social isolation.

Data availability statement

The data that support the findings of this study are openly available in Figshare at https://figshare.com/s/d078690a8c23f41b41ee.

Author Note

Correspondence concerning this article should be addressed to Cristina Harney, School of Psychology, University of Leeds, University Road, Woodhouse, Leeds, LS2 9JU. Email: c.harney@leeds.ac.uk This work was supported by University of Leeds as part of the lead author's PhD research. The authors report that there are no competing interests to declare.

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Appendix A.

Table 1. *Demographic information.*

	Sample *n*	% of sample		Sample *n*	% of sample
Gender female	122	60.10	Slovenia	1	0.5
Age			Switzerland	1	0.5
18-29	114	56.7	Turkey	1	0.5
30-45	61	30.4	**Area**		
46-59	21	10.4	City	116	57.1
60+	5	2.5	Small Town	40	19.7
Country			Large Town	33	16.3
UK	73	41	Village	12	5.9
Portugal	26	12.8	Hamlet	1	0.5
Poland	21	10.3	Isolated Dwelling	1	0.5
USA	10	5.0	**Living**		
Chile	8	4.0	House	118	58.1
Italy	7	3.5	Apartment/Flat	76	37.4
Mexico	7	3.5	Room in shared house	9	4.4
Canada	6	3.0	**Work**		
Netherlands	6	3.0	Still working	72	35.5
Spain	6	3.0	Decreased hours	32	15.8
Greece	5	2.5	Not working	21	10.3
Australia	3	1.5	Lost job	20	9.9
Estonia	3	1.5	Student	18	8.9
Ireland	3	1.5	Increased hours	14	6.9
Serbia	3	1.5	Furloughed	10	4.9
France	2	1.0	Furloughed now back at work	7	3.4
Hungary	2	1.0	Taken pay cut	6	3.0
South Africa	2	1.0	Other	3	1.5
Czech Rep	1	0.5	**Key worker**		
Israel	1	0.5	Yes	64	31.5
New Zealand	1	0.5	No	139	68.5