Table 1: Systematic reviews of music interventions for cancer

Source: Ava Lorenc, CAM-Cancer Collaboration. Music interventions [online document]. March 2024.

First author (year)	Interventions and main outcomes	Number of studies Type of studies Number of patients Interventions and comparators	Main results/Conclusion	Comments
Trigueros-Murillo (2023) **Overview of systematic reviews**	Music-based interventions Pain, fatigue and distress.	Overview of systematic reviews 13 systematic reviews with meta-analysis, containing 119 distinct primary studies. Music-based interventions	Most systematic reviews lacked a comprehensive search strategy, did not assess the certainty in the evidence and discussed their findings without considering the risk of bias of primary studies. The degree of overlap was moderate (5.81%). Overall, combining music-based interventions and standard care seems to be more effective than standard care to reduce cancer-related pain and fatigue but not distress*. Mixed findings were found for other psychosocial measures.	Well conducted with quality appraisal, checking or overlap and including papers in English or Spanish. Music based interventions not just music therapy. *Please note the original paper erroneously reported significant results but this has been pointed out to the authors for correction.
Bro (2017)	A systematic review and meta-analysis of psychological and physical effects of music interventions in active cancer treatment (anxiety, distress, quality of life, depression, relaxation, fatigue, nausea, and pain)	25 RCTs (20 for meta-analysis; n=1565). 17 used recorded music, 8 used live music; 15 were passive listening, 10 were active participation with music therapists. 20 used patient-selected music and 23 were individualised to the patient. Music intervention applied during chemotherapy, surgery, radiotherapy or other procedures/hospitalisation.	Music reduced anxiety (SMD −0·80 [95% CI, −1.35 to −0.25]), pain (SMD −0.88 [95% CI −1.45 to −0.32]), and improved mood (SMD −0.55 [95% CI, −0.98 to −0.13]). No significant difference for depression, spirit, distress, quality of life, relaxation, fatigue or nausea The most effective mode of music intervention appeared to be passive listening to self-selected, recorded music in a single session.	Comprehensive search and sound methodology. Included English or German studies. Did not assess publication bias. High heterogeneity and low to very low study quality. Small sample sizes and risk of underpowered studies limit the findings. Information on intervention content was lacking, as was focus on patients' musical background/preference.

Bradt (2021)		A Cochrane systematic review examining the effects of music therapy and music medicine interventions on psychological and physical outcomes in people with cancer.	81 RCTs and quasi-randomised trials (participants n = 5576) 74 adult trials, 7 paediatric trials 38 music therapy trials, 43 music medicine trials Trials took place in 13 different countries. No trials were excluded based on article language.	Results suggest that music interventions may have large effect on anxiety (CI -10.02 to -5.44; very low-certainty evidence) , moderate effect on depression (SMD: −0.41, 95% CI −0.67 to −0.15; very low-certainty evidence), large effect on pain ((SMD −0.67, 95% CI −1.07 to −0.26, very low-certainty evidence), and small effect on fatigue (SMD −0.28, 95% CI −0.46 to −0.10; low-certainty evidence). There was no difference between the effect of music therapy and music medicine for anxiety, depression and mood. Music interventions demonstrated a large effect on quality of life (SMD 0.88, 95% CI −0.31 to 2.08; evidence is very uncertain). Small treatment benefits were found for heart rate, respiratory rate and blood pressure. Meta-analyses did not find support for an effect of music interventions on mood or distress.	Searches were comprehensive: 14 electronic databases were searched and journals were hand-searched. Most trials were at high risk of bias and therefore the quality of the evidence is low. The main reason for receiving a high risk of bias rating was the lack of blinding. Blinding is often impossible in music therapy and music medicine studies that use self-report outcomes, since participants know whether or not they listened to music and/or participated in active music making. Therefore, it is often impossible for these types of studies to receive a low or even moderate risk of bias even if they have adequately addressed all other risk factors (e.g. randomization, allocation concealment, etc.).
Paediatric	Da Silva Santa (2021)	Music interventions Paediatric oncology anxiety, pain, QoL	11 studies (5 in meta-analysis). 429 children aged 0 to 18 years. Included music interventions combined with other therapies	Meta-analysis of 5 studies found pain and anxiety benefits for music compared to control (SMD - 1.05; CI 95% - 1.70 – 0.40 N = 453 I2 = 90 %), and for quality of life (SMD -0.80; CI 95% - 1.17- 0.43 N = 457= I2 = 71 %). Studies were of moderate to high quality.	Well conducted with quality appraisal and meta-analysis.
	Facchini (2021)	Music therapy. Paediatric oncology mental and physical outcomes.	19 studies (no meta-analysis) 596 children aged 0 to 24 years Excluded music interventions combined with other therapies.	Studies indicated a significant reduction of psychological distress (n = 9) and an increase in well-being (n = 8). 8 articles evaluated the effects on subjective pain and other biological parameters, with inconclusive results. Studies were overall good quality.	Not sure age 18-24 are classed as children. Little information on data synthesis methods, only briefly mentioned that MA not conducted due to heterogeneity. Analysis is limited. Well conducted searches/screening.

Huang (2023)	Music therapy. Anxiety and pain in colorectal cancer patients	10 RCTs	Nine (90%) showed statistically and clinically significant improvements across the outcome variables. Among the seven studies measuring pain as an outcome, four studies (57%) demonstrated that music therapy reduced pain. Three studies (75%) showed that MT reduced anxiety.	Only searched 3 databases. Search terms do not appear comprehensive. Only a narrative analysis, no meta-analysis and no explanation of why not.
Kohler (2020)	Music therapy Psychosocial outcomes.	30 studies (21 for meta-analysis, n not reported) Music therapy from a trained music therapist.	Meta-analysis found small but significant effects of music therapy on psychological well-being (d = 0.35, p < 0.001) and quality of life (d = 0.36, p = 0.023). Moderator analyses identified studies with a single session of music therapy and the use of receptive techniques to produce larger effects regarding psychological well-being.	Only searched 3 databases but some hand-searching included. High risk of bias in all studies. Small sample size in many studies. Did not report numbers of patients in meta-analysis. Did not limit by outcome although protocol has a list of psychological/ physical/ cancer outcomes.
Li (2020)	Music therapy Quality of life, anxiety, depression and pain in cancer.	19 RCTs 1548 participants. standard care control group. Various cancers. Music therapy. Only compared to standard care.	Meta-analysis found significant effects in favour of music therapy for anxiety (SMD = −1.51, 95% CI: [−2.27, 0.75], p < 0.05, I2 = 91%); depression (SMD = −1.12, 95% CI: [−1.87, −0.38], p < 0.05, I2 = 94%); pain (SMD = −0.73, 95% CI: [−0.94, −0.52], p < 0.05, I2 = 0%); and QoL (SMD = 0.54, 95% CI: [0.40, 0.69],p < 0.05, I2 = 49%), although subgroup analysis showed effects for quality of life were only for interventions of between 1 and 2 months.	Only included RCTs with a standard care control group. Included English and Chinese studies. Only searched databases (no grey literature searches). Overall, all trials included had a 'high risk of bias', mainly due to lack of blinding but also poor design and reporting of allocation concealment and blinding of outcome assessment. No publication bias observed.
Rennie (2022)	Music therapy Physical, cognitive, and psychosocial outcomes.	25 RCTs. Only included those at low risk of bias. 1875 participants. Music therapy compared to standard care only.	Of the 25 studies, 23 (92.0%) reported statistically and clinically significant improvements across the outcome variables (pain, anxiety, quality of life, mood, sleep disorders, fatigue, heart rate, blood pressure, respiratory rate, and oxygen saturation)	Only searched 3 databases. Search terms do not appear comprehensive. No meta-analysis and no explanation of why not.

Sheikh-Wu (2021)	Music-based interventions. Psychological distress, positive psychology, QoL	29 studies. 3162 participants. 19 studies were various cancers, 12 were breast cancer. Music-based interventions (with or without a therapist).	The overall ($g = 0.34$, $SE = 2.27$, $p < 0.05$) and psychological distress symptoms sub-outcome type ($g = 0.47$, $SE = 0.18$, $p < 0.05$) models with moderator analyses were statistically significant, suggesting that music-based interventions do mitigate cancer survivors' adverse psychological distress symptoms (i.e., stress, anxiety, and depressive symptoms), improve aspects of positive psychology (i.e., benefit-finding and resilience), and quality of life throughout their cancer survivorship continuum.	Well conducted and inclusive.
Wang (2018)	A systematic review and meta-analysis of music interventions on physical and mental status of patients with breast cancer.	30 RCTs (participants n=2559). 24 studies were in Chinese (6 in English). Only included standard care control groups. Most studies used receptive music listening on headphones, music mostly chosen by researcher and patient.	Music intervention was significantly effective in lowering systolic blood pressure (SMD –0.63, 95% CI –0.85 to –0.42; $p < 0.00001$), diastolic blood pressure (SMD –0.64, 95% CI –1.06 to –0.22; $p = 0.003$), and heart rate (SMD –0.45, 95% CI –0.66 to –0.24; $p < 0.0001$), and in relieving anxiety (Hamilton Scale: mean difference (MD) –7.04, 95% CI –9.31 to –4.78; $p < 0.00001$; Self-Rating Anxiety Scale: MD –7.40, 95% CI –10.28 to –4.52; $p < 0.00001$; State Anxiety Inventory: MD –12.40, 95% CI –21.86 to –2.94; $p = 0.01$), and depression (MD –7.39, 95% CI –8.35 to –6.43; $p < 0.00001$).	Searched 9 English and Chinese databases. 9 high quality studies, 21 poor quality. Substantial heterogeneity among studies. Unable to assess publication bias which is therefore a possibility.
Zang (2022)	Music therapy. Anxiety in patients with cancer	16 studies (RCTs) 1320 patients. Music therapy was listening to music. Only compared to standard care.	Compared with standard care, music intervention had a moderate superiority of anxiety alleviation (SMD: –0.54, 95% CI: [–0.92, –0.16]).	Included a meta-analysis. Only four databases and no other search methods. Inclusion criteria a bit vague. Most studies were only moderate quality and there was high heterogeneity in this pooled study. No publication bias.

| Zhong (2023) | Music therapy.

CINV in gastrointestinal cancer. | 7 studies. (n not reported)

Music therapy. Included music therapy with other relaxation methods. | Meta-analysis indicated that music therapy could reduce nausea symptom score after chemotherapy [mean difference (MD) = -3.15, 95% confidence interval (CI): -4.62 to -1.68, Z = -4.20, P < 0.0001], vomiting symptom score (MD = -2.28, 95%CI: -2.46 to -2.11, Z = -25.15, P < 0.0001) and incidence of grade I and above nausea or vomiting (odds ratio = 0.38, 95%CI: 0.26-0.56, Z = -4.88, P < 0.0001). 7/8 studies had high risk of bias. | Well conducted with meta-analysis.

Only included standard care control.

Meta-regression analysis found that publication year was not a specific factor affecting the combined results. There was no significant publication bias (P > 0.05). |

CI – confidence interval
RCT – randomised controlled trial
SMD – standardised mean difference
QoL – quality of life