

Response to reviewers

We would like to thank the reviewers for their extremely helpful comments, which we believe have enhanced the manuscript

Reviewer #1: This is an interesting meta-analysis on the role of art therapy in improving symptoms of schizophrenia. Since there are very few effective treatments for negative symptoms of schizophrenia, evidence-based evaluations of these somewhat unconventional therapies are very useful. However, if a few issues are sorted out this will improve the quality of an otherwise excellent manuscript. To my mind the foremost issue is with the definition of the term "art therapy." Though the authors have provided a definition (page 4) and discussed the effects of different types of art therapies (page 22), all this still seems to be a little inadequate to me given the importance of a precise definition. Since the findings and the central message of this meta-analysis hinges on this definition, the authors need to define the term more carefully, provide further details of the definition and the evidence from literature that would support their definition. In this regard, the authors state that - "Frequently used as an umbrella term, art therapy encompasses a variety of non-verbal, creative interventions such as: dance therapy, music therapy and body-oriented psychotherapy." The references for this statement are not very clear but the authors quote a conceptual review by Hogan, 2009, the MATISSE trial (Crawford et al. 2012) and a RCT by Montag et al. 2014. Out of these only Montag et al. provide some clue as to what art therapy consists of by stating that - "Under the

umbrella of creative therapies and based on a meta-analysis (en)compassing art, music, drama and dance movement therapies, art therapy was integrated in international treatment recommendations for schizophrenia like the British NICE guidelines." On the other hand, the NICE guidelines for schizophrenia actually provide a more comprehensive definition as well as a description of what is included in art therapies – "Arts therapies currently provided in the UK comprise: art therapy or art psychotherapy, dance movement therapy, body psychotherapy, drama therapy and music therapy" [page 217]. Another explicit definition of art therapies is provided in a systematic review of art therapy among people with non-psychotic disorders (Uttley et al. 2015; HTA Assessment: volume 19 issue 18). This review makes two things clear: one, that art therapy "is a specific branch of treatment under the umbrella term arts therapies," which also includes drama therapy, music therapy and dance movement therapy. Secondly, it also defines art therapy as treatment "using painting, clay work and other creative visual art-making." The implications of these definitions, therefore, are that the authors have to clarify whether theirs was a meta-analysis of art therapy or art therapies.

We have made it clearer that the meta-analysis is for art therapies rather than the narrower art therapy (although it obviously includes the latter as well)

They will have to then specify that art therapies (and not just art therapy) include creative visual art-making (missing from their definition), dance movement therapy (and not dance therapy as stated), music therapy (missing from their definition), drama therapy and body-

oriented psychotherapy. It would also be useful if the authors could briefly explain what body-oriented psychotherapy entails because many readers might be unfamiliar with the term. The title may need changing depending on whether authors choose to use either art therapies or art therapy. Moreover, since this is not an update of literature the more appropriate title would be: "Does art therapy reduce (or Do art therapies reduce) symptomatology in schizophrenia? An updated meta-analysis." Lastly, since none of the RCTs included in this meta-analysis would have used art therapies as sole treatments for patients with schizophrenia, it would better to include the word "adjunctive" in the title as in – Does adjunctive art therapy reduce (or Do adjunctive art therapies reduce) symptomatology in schizophrenia? An updated meta-analysis.

We have adjusted the title accordingly to reflect 'art therapies' and the adjunctive aspect

The second issue is that the review of prior evidence is somewhat sketchy. Though the authors have mentioned a number of meta-analytic investigations, narrative reviews and guidelines in different sections of the manuscript, some key ones seem to be missing. I think the review by Maujean et al. should be first mentioned in the introduction rather than the discussion. The review by Röhrich, 2009 on body oriented psychotherapy is mentioned in the reference list but I could not locate a reference to it in the main text. There are two other reviews, a recent narrative review on art therapy (Regev and Cohen-Yatziv, *Front. Psychol.*, 29 August 2018), and a meta-analytic review on dance

movement therapy by Koch et al. (The Arts in Psychotherapy 2014;41: 46-64.0, which the authors seem to have missed.

We have added the references as suggested

Finally, I think a few lines on the MATISSE trial and Priebe et al.'s study would be relevant here than later in the discussion, because these have has been the key trials in this area.

We have added more detail about these important recent trials in the intro

To sum up, a more comprehensive and succinct review of the issues in this area of research would provide a better context for the necessity of conducting the present meta-analysis and also make the findings of the meta-analysis more relevant. The authors state that the meta-analysis followed PRISMA guidelines. However, to be certain about this: a) It would be useful if the authors include a completed PRISMA checklist, perhaps as a supplement.

The PRISMA checklist was attached as an appendix

b) The authors also have to clarify whether they rated the quality of the studies and if they had done so, they should mention the tool/instrument used for this purpose. The results of the "PICOS" analysis as recommended by the PRISMA guidelines should also be mentioned.

We have added PICO's descriptors in the search details

On page 17 of the results the following sentence is somewhat unclear – “Turning to categorical variables, trials with high risk had significantly larger effect sizes than those at lower risk....” Do they authors mean a high risk of bias? If so this sentence should be re-written. In the discussion the authors could discuss the reasons for the failure of the MATISSE trial and Priebe et al.'s study to demonstrate positive results for negative symptoms. They could refer to the article by Holttum & Huet, 2014; Sage Open, which highlights the shortcomings of the MATISSE trial and an editorial by Crawford (Br J Psych 2016; 209; 6-8) on the same lines about the Priebe's study.

Reviewer #2: In general, this study is well-constructed and the methods have no critical flaws. The only concern of mine is abandoned five articles written in non-English. The author wrote that they were excluded because of the language. However, I guess these articles have an abstract written by English, because they matched the initial electrical search. If so, the author is recommended to examine the quality of these articles. Also, I believe the effect of art therapy depends on each participant's cultural background. Are there any data of the participants' race, ethnicity, and/or religions? It may be difficult to evaluate their influence on the effect of art therapy. Nonetheless, disclosing such information will be beneficial for clinicians and researchers of this region.

The 5 excluded non-English articles did not include any usable data

The point about cultural background is important and we have mentioned this in the discussion – unfortunately we could find no relevant evidence of this been examined in existing RCTs

Reviewer #3: This is an excellent review article addressing the question of benefit in schizophrenia of arts-based therapies. I would suggest that the title be " arts therapies " rather than art therapy which, to most readers, means drawing and painting. I would also suggest a discussion at the end about the limitation of using symptom reduction as an outcome measure. Many interventions may be able to improve quality of life without necessarily impacting symptoms.

This has been changed

Reviewer #4: Manuscript ID 49454 Does art therapy reduce symptomatology in schizophrenia? A meta-analytic update, by Laws & Conway 2019. This is a meta-analysis of the effect of art therapy on the symptoms of schizophrenia. The authors have searched PubMed and Scopus and retrieved 9 randomized controlled trials (RCT), totaling 948 participants and 473 controls. The quality of bias was assessed through the Cochrane risk of bias tool (RoB2). Meta-regression and sub-group analysis was performed to assess the moderators. In conclusion, although art therapy did not reduce total or positive symptoms, a 'small' therapeutic effect was found for negative symptoms. This is a well executed meta-analyses, encompassing all steps of a traditional quantitative study. Possibly the most important concern is the coverage of of all RCT that was searched in 2 databases. The CINAHL, Embase, Web of Science, Science Direct are some alternative databases. The

funnel plot shows an evident publication bias. I recommend the author to avoid the superlatives ("the most comprehensive", "the first time we..."). Academic writing needs ponderation. The authors may want to place or move some graphical elements as Supplementary material. Alternative, you can merge some Figures into a single Figure. Otherwise, this is a very good study.

We also hand-searched the reference lists as well as recent qualitative systematic reviews and feel confident that we have located all relevant trials

We have removed the superlatives