CORRESPONDENCE

Music Therapy in Palliative Care—A Randomized Controlled Trial to Evaluate Effects on Relaxation

by Dipl.-Psych. Marco Warth, M.A., PD Dr. med. Jens Keßler, Prof. Dr. sc. hum. Thomas K. Hillecke, and Prof. Dr. med. Hubert J. Bardenheuer in issue 46/2015

Relevant Errors Relating to the Measuring Method

Warth et al. (1) have contributed an important addition relating to the higher evidence of music therapy in palliative care and have shown the benefits of music therapy compared with a control arm in a randomized controlled trial using the intention-to-treat principle for its data analysis in 84 patients. However, in measuring and explaining the endpoint “Triggering of a physiological relaxation response” by means of heart rate variability (HRV) they made two crucial methodological errors. On the one hand, they used photoplethysmography to measure the intervals between successive heartbeats. In contrast to an ECG-based measurement of the RR intervals, the measurement of the pulse rate is affected by further factors—vascular stiffness, among others. A systematic review (2) found that pulse oximeters are suitable for measuring RR intervals to a very limited degree only. Formally, the correct term to be used should not be HRV but, in this case, pulse rate variability (PRV). Especially the high frequency band is subject to overestimates in PRV compared with HRV, as has also been shown elsewhere (3). For this reason, national guidelines on HRV do not recommend this measuring method (4). On the other hand, only the HF band was considered. This may wrongly be interpreted as raised if the analysis does not include the total power (TP) as the reference value. An increase in the HF in a setting of a simultaneous stronger increase in the other frequency bands (for example, LF) is imaginable, which would mean that the relative proportion of the purely parasympathetic HF band even decreases. Preferably the HF that uses the total power as the reference value could be used (4) or, additionally, the changes of other frequency bands, including the parameter LF/HF ratio, might also be considered.

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In Reply:

We thank our correspondents for appreciating the quality of our study as well as for their critical discussion of the methods for measuring the secondary outcome of heart rate variability (HRV). In the discussion section we address, firstly, the limited measuring precision of photoplethysmography (PPG) and, secondly, the restriction to the high frequency spectrum.

We accepted a possibly increased probability for unsystematic measuring errors in the context of PPG in return for a significantly reduced measuring effort on the part of the sensitive patient population (1). This crucial advantage of photoplethysmography compared with electrocardiography—that necessitates the placing of electrodes or a chest strap—has been explicitly pointed out in the cited review (2). In addition, this review underlines the fact that the PPG measurements undertaken in our study in a resting state generally provide accurate values. By contrast to the use of HRV as a diagnostic factor, the risk of systematic overestimation of the frequency band density in efficacy/effectiveness studies that compare change measurements between study groups can be regarded as less relevant.

The interpretability of many common HRV parameters is currently the subject of controversial discussion. The suggested practice of using ratios (HFn.u. and LF/HF ratio) has been criticized because of redundancies and unclear relevance in the absence of absolute values (3). An analysis of all available HRV parameters of interest in this context (RMSSD, pNN50, LF, HF, TP, ratios) is not practicable in the setting of the publication of results and disproportionately increases the statistical risk for a type 1 error. On the basis of the current discussion, the HF component seems most suitable for evaluating the cardiac effects of the applied relaxation intervention. DOI: 10.3238/arztebl.2016.0374b

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Conflict of interest statement

The authors of both contributions declare that no conflict of interest exists.