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Receptive and Fractal-Informed Music Interventions in Cardiovascular Medicine

Goran Krstačić[1]*, **Tin Krstačić**[2]

[1]Institute for Cardiovascular Prevention and Rehabilitation, Zagreb, Croatia

[2]University of Zagreb, Faculty of Economics and Business, Zagreb, Croatia

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***ADDRESS FOR CORRESPONDENCE:** Goran Krstačić, Poliklinika za prevenciju kardiovaskularnih bolesti i rehabilitaciju, Draškovićeva 13, HR-10000 Zagreb, Croatia. / Phone: +385-1-4612-290 / Fax: +385-1-4612-343

ORCID: Goran Krstačić, https://orcid.org/0000-0003-0427-7229

Cardiovascular rehabilitation addresses exercise capacity and secondary prevention, yet anxiety, fear of recurrence, sleep disturbance, and difficulties adapting to illness can complicate recovery. Receptive music interventions offer a potentially low-burden means of addressing some of these experiences.

This is a narrative review and methodological proposal, not a systematic review or meta-analysis. We prioritize controlled clinical studies, the Cochrane review in coronary disease, foundational physiological experiments, and established HRV methodology.[1-5] "Receptive music therapy" here denotes intentional listening within a therapeutic process involving assessment, goals, adaptation, and reflection with an appropriately trained practitioner. "Music listening" denotes exposure to recorded or live music without necessarily implying therapist involvement. "Fractal-informed music" denotes a stimulus whose temporal features are explicitly quantified or designed across scales. "Fractal chromomusic therapy" adds a synchronized visual or colored-light component and requires separate evaluation of acoustic and visual effects.

The two supplied Zagreb presentations describe a local rehabilitation workflow, individual musical preferences, session observation, and examples of HRV-derived visualizations. They do not contain a controlled dataset or sufficiently specified estimates for a new efficacy analysis. Their material therefore informs the clinical and research framework below, without being represented as published trial evidence. A pragmatic two-stage program would first test feasibility and acceptability, then estimate clinical effects in a prospectively registered, adequately powered trial. Enroll stable adults entering cardiac rehabilitation after acute coronary syndrome. Randomize with concealed allocation to (A) structured therapist-guided receptive sessions using patient-selected music, (B) fractal-informed music matched for preference and therapist contact, or (C) an attention-matched quiet-audio control, all alongside standard rehabilitation. The primary outcome should be one prespecified patient-centered endpoint, such as change in HADS anxiety score at eight weeks, with a clinically meaningful target and sample-size justification. Secondary outcomes can include quality of life, sleep, adherence to rehabilitation, heart rate, ambulatory blood pressure, and adverse emotional responses. Collect a standardized resting ECG and respiration at baseline, week four, week eight, and three months; retain 24-hour Holter data for exploratory circadian and ectopy analyses. Prespecify artifact handling, sinus-rhythm inclusion, window lengths, RR correction, RMSSD, SDNN, DFA α1, sample entropy, and multiplicity control.

Receptive music interventions may reduce anxiety and modestly affect short-term cardiovascular measurements in selected settings. Individual preference and structured clinical delivery deserve direct comparison. Fractal analysis offers useful tools for specifying sound and quantifying cardiac dynamics, but a therapeutic advantage of "fractal" music has yet to be demonstrated.

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