HEART RATE VARIABILITY AND EMOTION REGULATION IN ADULTS WITH EATING DISORDERS OR OBESITY: A SYSTEMATIC REVIEW

**OBJECTIVES**

1. How does HRV relate to ER in adults with disordered eating?
2. Is HRV a valid biomarker of ER in adults with disordered eating?
3. Can HRV index post-intervention ER change?

**METHODS**

2.1 Systematic literature search

**SEARCH QUESTIONS**

- PROSPERO ID: CRD42020201406
- PRISMA search was performed on PubMed, MEDLINE & PsycINFO.
- Identified studies screened against a priori eligibility criteria.

2.2 Study eligibility criteria (PICO)

- **Participants/population**: Inclusion: human, adult, clinically significant ED or irregular eating behaviour. Excluded: organic cause.
- **Intervention** - HRV (time/frequency domain)
- **Outcomes** - HRV (time/frequency domain)
- **Study design** - Excluded: full peer-review papers, editorials, letters & student dissertations. Exclusion: systematic reviews, meta-analyses, conference abstracts, posters, or book chapters.

2.3 Risk of bias / quality assessment

Data was extracted and synthesised in a qualitative manner.

**RESULTS**

15 publications were included, which involved individuals with obesity, BN, BED, AN, their subclinical presentations, and mixed BED populations. Studies were small (n=49), predominantly female (89.1%), and were highly variable in methodology, with different diagnostic tools, self-report measures & emotional tasks / paradigms used.

**CONCLUSIONS**

Overall, the evidence suggests that HRV is a valid, objective biomarker of ER impairments in AN, BN, BED, and obesity. Despite some inconsistencies, likely attributable to the methodological heterogeneity present throughout the included literature, disordered eating appears to be characterised by reduced resting state vagal activity and abnormal stress reactivity. Furthermore, the ANS dysfunction observed across the spectrum of EDs/obesity may be reversible by novel effective treatments, e.g., HRV biofeedback or PlayMancer videogame therapy.

**REFERENCES**

**STRENGTHS & LIMITATIONS**

- Moderate risk of bias in 53% & high risk in 27% of studies = possibility of under-reporting.
- Excluded if <15 years = gap in the literature regarding HRV & ER in children/adolescents with EDs.
- Only 4 studies controlled for age and/or sex as covariates which can confound HRV.
- Unequal representation (most studies in obesity, BED & defined mixed groups) = need further research in more clearly defined groups & AN.
- Wide range of disordered eating; variation in diagnoses, diagnostic measures & tools used to assess ER outcomes meant that quantitative statistical analysis was not feasible.
- Controversies exist in what can be inferred from the various HRV indices which limits interpretation.

**FUTURE DIRECTIONS**

- HRV-Biofeedback: Real-time feedback of HRV data during breathing in resonance frequency to ↑ER. HRV-BF was an effective intervention for ↑ER in obesity. Future investigations using ↑samples sizes & populations of BED / BN / AN / subclinical needed.
- PlayMancer: Videogame to ↑ER by training ↑self-control skills and ↓impulsive behaviours. Therapeutic potential shown in BN. Future studies should explore applicability in other EDs/obesity.
- Debate exits to whether self-reported eating behaviours (e.g., binge & restrained eating) reliably correspond to the actual occurrence of pathological eating. Future studies should objectively measure real-life consumption / restrained (↑ subjective self-reporting).