Cardiac Rehabilitation: Impact on Psycho-behavioral Symptoms, Inflammation, Cardiac Health, and Quality of Life

Deborah Sindewald, BSN, MSN, PhD, Dina Tell, PhD, Research Assistant Professor (Loyola University Chicago), Herbert Mathews, PhD, Professor (Loyola University Chicago), Karen Saban, PhD, RN, APRN, CNRN, FAHA, Associate Professor, Associate Dean for Research (Loyola University Chicago), Linda W. Janusek, PhD, RN, FAAN, Professor & Niehoff Endowed Chair for Research (Loyola University Chicago)

Purpose and Significance

- Guided by Psychoneuroimmunology theory, the purpose of this study was to examine psycho-behavioral symptoms and IL-6, with respect to cardiac health and quality of life (QoL), in cardiac patients over a 12-week cardiac rehabilitation program.

Background

- Cardiac events result in psychological stress, depressive mood, fatigue, and sleep disturbance (psycho-behavioral symptoms), which jeopardize cardiac health. To promote recovery, cardiac rehabilitation programs provide monitored exercise and health education. Whether rehabilitation reduces psycho-behavioral symptoms or stress-related inflammation remains unclear. Inflammatory mediators (interleukin 6; IL-6) contribute to cardiovascular disease and engender psycho-behavioral symptoms.

Theoretical Framework

Methods

- A prospective longitudinal design,
- Participants were evaluated at program start (T1), mid-program (T2 - 6 weeks), and program completion (T3 -12 weeks).
- Forty of 58 participants completed all time points.
- At each time, participants completed questionnaires, and provided a blood sample for IL-6 measurement (enzyme linked immune- absorbent assay).
- Cardiac health data, including HDL and LDL levels, and metabolic equivalents (MET) were collected from medical records.
- Data were analyzed using ANOVA, Pearson’s r, and multi-level linear modeling.

Results

- Although perceived stress decreased significantly over the course of cardiac rehabilitation, 35% of participants continued to report increased stress at T3.
- Depressive mood did not change over rehabilitation, with 22% scoring above the cut-score for depression risk.
- Fatigue decreased significantly over time; however, those with greater fatigue had worse cardiac health.
- Sleep quality improved significantly over time, yet, 42% of participants reported sleep disturbance at T3.
- Both total QoL and the Health Functioning Subscale (HFSUB) significantly improved by end of cardiac rehabilitation.
- Both QoL and HFSUB were negatively correlated with depressive mood, disturbed sleep, fatigue, and perceived stress, but positively correlated with social support.
- Although IL-6 did not change over time, participants with higher IL-6 levels had lower MET levels, lower HFSUB, and greater LDL levels.

Psycho-behavioral Variables - Change over Time

- Depressive Mood: 8.6 ± 8.6 to 7.2 ± 3.9, P = .05
- Sleep Disturbance: 9.4 ± 8.5 to 6.4 ± 3.6, P = .05
- Fatigue: 9.9 ± 19.2 to 3.9 ± 9.9, P = .05
- Perceived Stress: 11.1 ± 7.1 to 9.8 ± 6.4, P = .05
- Quality of Life: 23.9 ± 3.9 to 25.1 ± 3.2, P = .05
- Health Functioning QoL: 22.7 ± 4.3 to 24.5 ± 4.6, P = .05
- Social Support: 81.7 ± 10.2 to 84.7 ± 8.3, N.S.

Association Between Psychological Variables & Quality of Life

- CES-D: .816 ** .562 **
- PSQI: .416 ** .453 **
- MFSI: .580 ** .470 **
- SPSS: .742 ** .748 **
- CES-D: .590 ** .574 **
- PSQI: .405 ** .366 **
- MFSI: .587 ** .537 **
- SPSS: .757 ** .716 **
- CES-D: .480 ** .532 **
- PSQI: .418 ** .334 **
- MFSI: .560 ** .703 **
- SPSS: .547 ** .464 **
- MFSI: .826 ** .634 **

*p < .05 ** p < .01

Conclusions & Implications for Practice

- Psycho-behavioral symptoms and QoL improved over cardiac rehabilitation.
- Yet a sizeable proportion of participants continued to experience stress, depressive mood, and sleep disturbance at completion of rehabilitation.
- Findings emphasize the need for cardiac rehabilitation clinicians to address psycho-behavioral symptoms to promote holistic recovery, better QoL, and future cardiac health.